



GOVERNMENT OF BERMUDA
Department of Planning

A Guide for the Installation of Renewable Energy Generation and Collection Systems

The Bermuda Plan 2008 permits renewable energy facilities at the discretion of the Board, as referenced in Chapter 12: Utility Services, policy UTL.6. Renewable energy systems (particularly solar hot water and solar photovoltaics) are encouraged. This Guidance Note provides assistance for the preparation of an application for planning permission or a Permitted Development Permit as appropriate.

Finding an appropriate balance between maintaining Bermuda's image and building self-reliance in energy generation is important. Placement of these systems with an eye to the most limited visual impact from off-site locations while maintaining the system's effectiveness is strongly endorsed. As a result, and for example, placement of panels on accessory buildings, flat roofs, porch and terrace coverings, shutters and other less visible locations with appropriate orientation is encouraged.

Assessment of the potential noise impacts of a prospective wind turbine is a component in the action taken on such an application.

Disposal of defunct storage batteries shall be through the Hazardous Waste Disposal program.

When is permission needed?

General Development Order: Under the 1999 General Development Order (GDO) as amended, solar energy collection systems not exceeding 400 square feet are permitted with a Permitted Development Permit (PDP) if:

- The system is on the building or within the curtilage of a building; and
- No part of the solar energy collection system installed on a building projects more than ten inches above the surface of the roof; and/or
- No part of a solar energy collection system installed on the ground exceeds four feet in height.

All Other Proposals: Planning permission by the Development Applications Board (DAB) is required for any larger energy generation or collection system, or one not meeting the above criteria.

A building permit may be applied for once planning permission has been approved.

What are the application procedures?

GDO: The PDP application form, with appropriate supporting materials and filing fee (presently \$155), is required for this process. The review process runs about 1 week, from application to permit issuance.

All Other Proposals: Application is made using the standard DAP-1 form with appropriate fee (presently \$258) and supporting materials. Additional information may be required depending on site circumstances.

Many of these applications will fit priority-tracking standards, with a shorter review processing time from

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application to planning permission action by the Board.

Following planning approval, a building permit application can then be filed, which review requires an average of 2 weeks.

Key considerations will include:

- Visual impact
- Noise impact
- High wind survivability
- Building Code compliance
- Adequacy of system and technology for intended purposes

What are the Application Requirements?

Any such application requires:

- Appropriate application, mapping (location plan, site plan, elevations showing proposal), fee and support materials
- Component performance test results (i.e. energy production estimates until energy generation licensing by the Department of Energy is in place, wind turbine noise generation (decibel levels) at various wind speeds and relevant distances)
- Compliance with building code requirements
- Information on the high-wind event survivability of system components

Site Plan: See application checklist. Plan should include existing ground elevations; setbacks, locations and sizes of panel arrays, wind turbines and any supporting elements; aggregate panel square footage; height and diameter of turbine and supporting mast; location of storage batteries, if any; and existing/proposed landscaping. (Depending on the site circumstances, more or less information may be required.)

Building Elevations (for building-mounted systems): Elevations should indicate a system's proposed location on the building; height above roof and above ridge line; and any factors affecting the visibility of the proposed system from adjacent streets and properties.

Photo-montages (non-PDP applications): Photo-montages showing the rooftop panels and/or mast and turbine system, as viewable from surrounding viewpoints, should be provided. Viewpoints of particular interest: those from adjoining properties, area streets and the coastline or waterfront.

Guidelines for all Roof Placements

- Some roofs may require structural reinforcement.
- Placement on accessory buildings, flat roofs, porch and terrace coverings, shutters and other less visible locations is encouraged.
- Consideration should be given to maintenance arrangements for the roof, particularly in its role as a water catch.
- For solar hot water heating: Components, including all pumps and plumbing, must meet building code requirements. The system components should be securely mounted and carefully sealed to prevent leaks.

Guidelines for all Ground Placements

- Ground installations shall typically not be allowed within required setbacks. Where there are no

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Guidelines for 'Domestic' Wind Turbines

- suitable alternatives, written grounds in support explaining why this is the best location, and a letter of acknowledgement from the affected neighbor, should be provided.
- Landscaping serving to buffer the visual impact of the proposed system while also maintaining the system's effectiveness may be required.
- The primary concerns regarding wind turbines are visual impact, the nuisance potential through noise and vibration generation, and high wind survivability. An application should address each of these concerns.
- Guidelines on Small Scale Wind Turbines, developed by the Department of Energy, are being finalized. Once these are available, the technical standards therein cited will provide the relevant guidance.
- Self-supportability is strongly encouraged; guy-wired masts will generally not be recommended for approval.
- Safe air traffic operations may exclude certain sites from consideration for wind turbine siting, or may limit the height of the wind turbine, island-wide, but specifically within the Airport Control area. Safety lighting may be required. This is due both to potential interference with operational systems and to potential impact on flight paths. If the proposal is within an area of concern the Department of Airport Operations and Civil Aviation will require confirmation of no interference with safe operations.
- In general, the maximum height that will be considered for a wind turbine/mast is 45'.
- No part of the system shall be located within minimum required setbacks unless there is no suitable alternative. Where that is the case, written grounds in support explaining the location choice and a letter of acknowledgement from the affected neighbor should be provided.
- Noise generated during operation shall not exceed 55 dbA, measured five feet above ground level at the closest property line. (This may be exceeded during short-term events such as severe wind storms with sustained winds of 58 miles per hour/50 knots.)
- No artificial lighting, except as required for safe airport operations, and no advertising of any sort will be approved.

DEP Construction Permit, Annual Controlled Plant License

For solar photovoltaic systems and for wind turbines: A permit to construct and an annual controlled plant license from the Department of Environmental Protection (DEP) are also required. Forms for these approvals are available at DEP's Botanical Garden offices, and fees are required.

Planning permission typically requires an approved DEP Permit to Construct with the building permit application, and an approved License to Operate before the building permit's Certificate of Use and Occupancy can be issued.

Solar hot water systems do not require this licensing.