


GUIDELINES

FOR

NEARLY ZERO

ENERGY BUILDINGS

(NZEB)



Department of the Environment,
Heritage and Climate Change

HM Government of Gibraltar

Guidelines for Nearly Zero Energy Buildings (NZEB)

1. Purpose

These guidelines establish minimum requirements for energy performance in new and renovated buildings, in accordance with the Environment (Energy Performance of Buildings) Regulations 2012 (as amended), with the goal of achieving *nearly zero energy* operation. They support Gibraltar's climate objectives, reduce building-related emissions, and promote the use of renewable energy, and are intended to provide further clarity surrounding particular scenarios.

2. Scope

These guidelines apply to:

- All new buildings;
 - Extensions to buildings where these comprise more than 25% of the existing floor area;
 - All developments or works falling within the above categories, subject to the exemptions and special provisions set out in Section 6 (Exemptions and Special Provisions).
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3. Definition of a Nearly Zero Energy Building (NZEB)

A **Nearly Zero Energy Building (NZEB)** is defined as a building that:

- Has **very high energy performance**, with energy demand minimized through passive design and efficient systems; and
- Has its remaining energy needs covered, to a significant extent, by **renewable sources**, produced on-site or nearby, within Gibraltar.

Indicative benchmarks:

- **Primary energy use:** $\leq 45\text{--}60$ kWh/m²·year depending on building type;
- **Renewable contribution:** $\geq 40\text{--}50\%$ of total energy use, measured as primary energy.

A '**major renovation**' means the renovation of a building where:

- A. The total cost of the renovation relating to the building envelope or the technical building systems is higher than 25% of the value of the building, excluding the value of the land upon which the building is situated; or
- B. More than 25% of the surface of the building envelope undergoes renovation.

Building Type	Maximum Primary Energy Use (kWh/m²-year)	Minimum Renewable Share
Residential (single-family)	≤ 45	≥ 50%
Residential (multi-family)	≤ 50	≥ 50%
Non-residential	≤ 80	≥ 40%
Existing building (major renovation)	≤ 60	≥ 20%

(These values correspond to total primary energy, including heating, cooling, ventilation, domestic hot water, and lighting, based on standard use conditions.)

4. Design and Performance Requirements

4.1 Building Envelope

- **Thermal transmittance (U-values)** shall not exceed (just keep minimum or better):
 - Roof: **0.20 W/m²·K**
 - External walls: **0.35W/m²·K**
 - Floors: **0.40 W/m²·K**
 - Glazing (solar control, low-e): **1.3 W/m²·K**, with **g-value ≤ 0.35** for solar protection.
- Buildings shall incorporate **external shading devices** or equivalent passive measures to control solar gains.
- Orientation, compactness, and natural ventilation shall be optimised for local climatic conditions and demonstrated at the planning stage.

4.2 Building Systems

- **Heating and cooling systems** shall achieve a **seasonal efficiency (η_s) ≥ 90%**.
- **Heat pumps** should meet or exceed **SCOP/SEER of 4.0/5.0**.
- **Ventilation systems** must include heat recovery with efficiency ≥ 70%, where applicable.
- **Lighting systems** in non-residential buildings shall employ **LED luminaires** with occupancy and daylight controls.

4.3 Renewable Energy Integration

- Planning applications must include a renewables assessment with a view to understanding which technologies or combination of technologies could provide the minimum requirements.
 - On-site renewables shall provide **at least 40% of total primary energy demand** (PV, solar thermal, heat pumps or other renewables) or more if roof area allows.
 - Buildings must be designed to allow future integrations.
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5. Compliance Pathways

Developers must demonstrate compliance through:

1. **Performance-Based Approach** – modelled annual primary energy use and renewable contribution in accordance with approved software such as the IES Virtual Environment DSM or the SBEM-GI.
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6. Exemptions and Special Provisions

6.1 Small Buildings and Extensions

The following are **exempt** from mandatory NZEB compliance:

- **Standalone buildings** with a **total useful floor area** of **less than 50 m²**;
- **Extensions** to existing buildings where the **additional floor area** is **less than 25%** of the original building's area or **below 50 m²**, whichever is greater;
- **Temporary buildings** with an intended service life of **less than two years**.

Note: Such exempted structures are still encouraged to adopt cost-effective energy efficiency measures where practicable.

6.2 Buildings Without Roofs

These guidelines **do not apply** to structures that:

- Lack a roof or significant building envelope (e.g., open carports, covered walkways without enclosed space, outdoor shelters, or canopies); or
- Are primarily **non-enclosed** in function and usage.
- Are material changes of use or renovations that involve single units within an existing building that do not include the roof.

6.3 Heritage Structures

Listed buildings may be **partially exempt** where full compliance would unacceptably alter their character or fabric. In such cases, reasonable energy performance improvements shall be implemented to the extent technically and aesthetically feasible.

6.4 Unusual building types not covered by the National Calculation Methodology

Building types which are not covered by the National Calculation Methodology may be exempt from demonstrating compliance with the NZEB standards, however, they will be required to produce an accurate assessment of operational energy using the full simulation capabilities of the approved DSM software. Conditions may then apply to this. The Department of Environment and Climate Change will set project-specific targets.

7. Verification and Documentation

- Compliance shall be demonstrated through an **Energy Performance Certificate (EPC)** or equivalent documentation.
- As-built verification of key energy features (insulation, system efficiencies, and renewable installations), photographic evidence, commissioning certificates and renewables commissioning reports are required prior to occupancy certification.

8. Requirement to use Dynamic Simulation Modelling

A building is classified as Level 5 complexity when its design or systems are too complex to model using SBEM.

If a building is classified as Level 5 complexity then it will need to be modelled using a **Dynamic Simulation tool**. In Gibraltar, the IES Virtual Environment is the approved software for compliance.

Typical triggers include:

a. Complex Building Geometry or Layout

For example:

- large **atria**
- unusual building shapes
- multi-storey interconnected spaces.

b. Advanced Environmental Control Systems

For example:

- advanced ventilation strategies
- ventilation with thermal coupling to the building structure
- automated façade systems
- automated blinds or shading systems
- advanced control systems.

Some examples of buildings that are likely to have these are:

- airports
- major shopping centres
- high-rise office towers
- complex hospitals or laboratories.

These buildings must be assessed using **Dynamic Simulation Modelling (DSM)**, which models hourly energy performance rather than using simplified assumptions.

These guidelines are intended to clarify aspects of the NZEB requirements that often arise.
