OWNER'S PROJECT REQUIREMENTS (OPR)
ZERO ENERGY GUIDANCE TEMPLATE

VERSION: 7/19/2019

INTRODUCTION

The International Living Future Institute (ILFI) is providing the following guidance document for Washington State agencies that are developing zero energy (ZE) or zero energy-capable (ZE-C) projects in accordance with Executive Order 18-01. The guidance provided in this document is focused specifically on meeting these energy performance targets, and project teams are encouraged to use this content to supplement their existing OPR language that addresses other sustainable design or standard performance criteria for the project.

HOW TO USE THIS DOCUMENT

Guidance in modifying the project OPR are stated below in bullet form, and all blue text represents sample language that may be directly incorporated into the text. Comments stated in [brackets] should be modified to reflect project-specific conditions.

ADDITIONAL GUIDANCE

For additional guidance on the use of this document or other zero energy resources, contact the following parties:

International Living Future Institute

Andrew Lee
andrew.lee@living-future.org
206-223-2028

Washington Department of Enterprise Services

Donna Albert
donna.albert@des.wa.gov
360-489-2420

SECTION GUIDANCE

Recommended edits or amendments to OPR language are stated below under each anticipated section of an OPR. Note that the section titles below may not directly match the project's existing OPR, though teams are encouraged to adapt the content to whichever section is most relevant.

Project Information / Owner and User Requirements

An introductory section should provide key information about the project, including enough detail to give the design team a sense of the key user needs or opportunities that should be considered when making energy-related decisions.

- Provide a general description of the project that summarizes the building size, core functions or activities and all primary user groups.
- Summarize any restrictions or conditions that are unique to this specific project, such as special health/safety or security concerns, public engagement opportunities, etc.
- List each of the major space types with their associated occupancy and operating hours

Commissioning

This section should identify commissioning as a critical process that involves the entire project team and outline the key activities at each phase.

- State that the owner will retain a third-party commissioning agent to manage the process throughout design, construction and occupancy
- State the major commissioning activities at each phase. Example:

  The commissioning process will include design reviews, construction inspections, pre-functional testing, development of a systems manual, operator training and post-occupancy evaluation.

Environmental & Sustainability Goals

This section should outline any high-level goals of the agency, which includes the pursuit of ZE or ZE-C performance. Any third-party certifications or verification frameworks should be referenced here.

- State any agency-specific sustainability goals or values that will drive the project development. Example:

  The project will be designed to support the agency's goals of [ecological preservation, public awareness, human health & safety, robust operations and cost-effectiveness].

- State the intent to measure and verify zero energy performance via a third party. For example:

  The project will be designed to be Zero-Net-Energy (ZNE) or Zero-Net-Energy Capable (ZNE–C), including plug loads, and will be verified through 12 months of performance measurement through use of the International Living Future Institute's (ILFI) Zero Energy certification program.

- State any additional building certifications and specific certification levels that will be utilized to verify project performance. For example:

  The building will be designed to target a Platinum level under the LEED v4 Building Design and Construction (BD+C) rating system, with a minimum required achievement level of LEED Silver.

Energy Efficiency Goals

This section should outline specific energy goals, rather than general statements of intent, in order to set expectations for the desired outcome of the building and systems design.

- State the zero energy-capable energy efficiency target that is defined by the State agency or from pre-design studies. Specify the target relative to an established performance standard or in terms of an energy use intensity (EUI) target. For example:

  The project shall be designed to achieve an annual site energy use intensity (EUI) of below [25 kBtu/ft^2-year], or other defined target as necessary to meet a net zero annual energy balance using on-site renewable energy.

  The project will be designed to consume [25% less energy] on an annual basis compared to an equivalent new building that complies with the 2015 Washington State Energy Code.

- If a project-specific energy target is not yet established, state that the design team shall establish EUI targets for all primary space types during schematic design.

Architectural Requirements

This section should outline any passive design elements or other best practices that should be adopted by the architectural team.

- Include requirements for the building form and spatial layout related to daylight design and utilization of natural ventilation. Examples:

  The building shall be sited, oriented and massed for maximum daylight access, ensuring that natural light will be available to all regularly occupied [offices, meeting rooms and training areas].

  Provide elements to control direct daylight penetration and glare at perimeter spaces, such as exterior louvers, light shelves and interior shades.

  Where possible, utilize natural or mixed-mode ventilation for regularly occupied spaces such as [offices, meeting rooms and training areas].

  Incorporate passive and low-energy comfort moderation systems such as operable windows and ceiling fans.

- Include requirements for building envelope related to energy performance. Examples:

  The building enclosure system shall be designed to minimize heating and cooling loads and eliminate thermal bridging by incorporating continuous insulation in roof, wall, floor slab edge and fenestration.

  Insulation levels shall be optimized via energy modeling in order to meet the energy use target specified above.

Electrical and Utility Requirements

This section should include any performance criteria for the efficiency and control of lighting systems or plug loads, as well as how energy data is collected and shared.

- Require high-efficiency indoor lighting systems. Example:

  All fixed lighting fixtures shall be LED-based or equivalent highest-efficacy alternative.

- State that LED-based task lighting shall be provided with individual control.
- State that lighting controls shall shut off lighting during periods of vacancy. Example:

  Vacancy-sensing controls with manual override shall be installed to turn off electrical lighting systems in spaces that are unoccupied.

- State that lighting circuit designs shall support daylight harvesting systems. Example:

  Configure lighting circuits and dimming systems to maximize the use of daylight harvesting systems at all perimeter zones.

- State that lighting circuits shall allow timeclock functionality. Example:

  Design lighting circuits and controls to allow scheduled time-based shutdown with occupancy override.

- State that switchable outlets or "green plugs" shall be provided. Example:

  Provide smart or switchable outlets for all plug loads that can be power-saved during periods of no occupancy.

- State that metering shall be provided to isolate and report all major end uses. Examples:

  Provide continuous metering and data logging systems to track all major energy end uses of the building, including equipment loads.

  Provide monitoring systems that allow remote access, extraction and analysis of energy data by the building operations staff and integration with a public dashboard.

Mechanical Requirements

This section should include criteria for the efficient operation and control of mechanical systems, as well as any thermal comfort criteria.

- State that HVAC systems shall not utilize combustion.
- State an intention to zone mechanical systems appropriately. For example:

  HVAC systems shall be zoned to separate space types with distinct conditioning demands, ensuring that comfort is provided while maximizing energy efficiency.

- State a preference for demand-control ventilation. Example:

  Where possible, ventilation systems shall be designed with CO_2-based demand control to optimize outdoor air delivery while maximizing energy efficiency.

- Require the use of heat recovery. Example:

  Heat recovery ventilation systems shall be installed and configured to enable the most efficient use of heat generated by the HVAC systems.

- State criteria for HVAC controls that permit continuous monitoring. Example:

  Mechanical systems shall be selected with an energy monitoring and control system (EMCS) with direct digital control (DDC).

- State an intent to display or share energy consumption data. Example:

  Select control and monitors systems that enable access to real-time energy, demand and weather data that can be accessed via a public display or web interface.

- State thermal comfort requirements and any special conditions. Example:

  HVAC systems shall maintain comfort conditions that meet the criteria stated in ANSI/ASHRAE Standard 55-2013.

  Systems that support space conditioning for occupant comfort in [offices] shall be separate from systems utilized to meet [laboratory] conditioning and air filtration demands.

- State that rooftop mechanical systems shall not inhibit solar potential. Example:

  Design rooftop mechanical units to be compact or consolidated, so as to maximize the contiguous area available for rooftop renewable energy systems.

- State solar readiness for any ZE-C projects that will not install on-site renewables. Example:

  Electrical conduit and wiring shall be provided to facilitate the future installation of renewable energy systems and the associated balance of systems.

Renewable Energy Requirements

This section should concisely state the type and criteria for any renewable energy systems.

- State the preferred renewable energy systems. Example:

  Renewable energy systems shall be selected to generate the highest amount of annual energy at least cost, with preference for solar photovoltaic (PV) energy systems.

- State that all renewable energy systems shall be separately metered.

Information Technology (IT) & Telecommunications Requirements

This section should include energy-efficient procurement criteria that is relevant to the equipment types utilized in the project.

- State energy efficiency as a primary criterion for equipment selection. Example:

  Any new IT equipment or appliances shall be purchased with energy efficiency as a primary consideration. Preference shall be given for ENERGY STAR rated equipment, where applicable.

- State a preference for the use of laptops or other low-power computing equipment where possible.

Applicable Codes, Standards and Regulations

This section should include any relevant performance standards that affect energy consumption.

- Examples:
- ANSI/ASHRAE/IESNA Standard 90.1-2016 (New Building Energy)
- ANSI/ASHRAE/IESNA Standard 100-2016 (Existing Building Energy)
- ANSI/ASHRAE Standard 55-2013 (Thermal Comfort)
- ANSI/ASHRAE 62.1-2016 (Ventilation)

Additional Considerations

Additional sections may be included in the OPR that address specialized functional areas of the project, such as laboratory or testing spaces. These sections should include energy best practices as well, which may be sourced from third party guidance documents written for these space types.

- Example of laboratory guidance:

  Design laboratory spaces based on classification-driven ventilation requirements, consolidating zones of similar type.

  Wherever possible, utilize variable air volume fume hoods.

---------- END OF DOCUMENT ----------