Purchasing Green Energy

Green Energy is a term used to describe electricity generated from renewable resources such a wind, hydroelectric and photovoltaic (PV). The Proponent proposes to purchase Green Energy amounting to 35% of the house electrical load for at least two years. Individual tenants may also opt to purchase Green Energy for their individual accounts, but that will be an individual choice made prior to or after occupation, based on then-available source options and rates.

F.2.1.3 Other Related

Proponent's Influence on Tenant Choices

The Burnham Building is being redeveloped for future tenants. Therefore, the Proponent's ability to influence tenants to fit out and operate their spaces with sustainable and energy efficient designs and operating practices will influence the overall energy and GHG profile of the building.

The Proponent's influence is not quantifiable as a GHG reduction, but represents an important component in the Project's long-term energy efficiency and, hence, GHG emissions. Actual building energy use will depend upon the core and shell design, for which the Proponent is responsible, and also upon what the tenant adds to the building (fit-out) and how the tenant operates.

While the Proponent does not have ultimate control over the tenant's energy use, it is committed to exerting whatever influence it can to encourage decisions that will maximize the building's energy efficiency.

Direct Support

The Proponent will provide certain support services to tenants to aid in selecting and implementing energy efficient systems, including:

- Proponent's MEP Engineer will be made available to the tenant for design assistance.
- Proponent will assist the tenant with selecting equipment subject to utility energy efficiency rebates and will assist the tenant in applying for and obtaining those rebates.
- Proponent's LEED Coordinator will be available to the tenant for design purposes in order to meet the criteria for LEED certification at or above the Silver level.
- Recommendation of preferred alternatives (material selection) over typical choices (even going beyond LEED in some cases).

- Provide electric vehicle charging stations in the parking garage.

Tenant Manual and Lease Provisions

While not directly contributing to a reduction in GHG emissions, a Tenant Manual provides recommendations on energy reducing systems and equipment for tenant use, and informs the tenant of system limitations imposed by building design. The Tenant Manual will be used as the basis for lease agreements associated with the Project.

The Tenant Manual will encourage tenants to minimize energy use. The Proponent has committed to the preparation and implementation of a Tenant Manual, including a set of Building Rules and Regulations, that will in some cases require, and in others encourage, tenants to adopt appropriate sustainable design, energy efficiency, water use, water pollution control, and transportation demand management (TDM) commitments.

The Tenant Manual will:

- identify Sustainable Design and Construction Guidelines;
- require tenants to utilize Energy Star-rated appliances and electronics where such rated equipment is available for the specific need;
- encourage the commissioning of the fit-out systems;
- encourage participation in the state-wide Green Initiatives Recycling Program;
- encourage recycling of construction waste; and
- recommend use of preferred (material selection) alternatives over typical choices (going beyond LEED in some cases).

Furthermore, the Building Rules and Regulations will require tenants to:

- design electric wiring and electric systems compatible with the application of building Energy Management System and automated lighting controls;
- require use of low-flow toilets and other fixtures; and
- require utilization of VFD's in HVAC systems (where applicable).

Recycling Areas

The Burnham Building will include recycling collection areas so that tenants can participate in the state-wide Green Initiatives Recycling Program.

Enhanced Refrigerant Management

Refrigerants, typically various compounds classified as hydrofluorocarbons (HFCs), are greenhouse gases of stronger effect than CO_2. Releases of HFCs, however, are due to leaks or equipment failure and are not routine emissions. Nevertheless, use of low-CO_2-equivalent HFCs is beneficial, providing that the functionality of the refrigeration equipment is maintained.

LEED certification requires adopting a refrigeration management system that allows no chloro-fluorocarbon (CFC) use. LEED Enhanced Refrigerant Management, a system to select refrigerants with the least ozone depletion potential, will be applied during later design. The Proponent will evaluate which refrigerants are designed into the building's HVAC and refrigeration components as well as fire suppression systems. Inclusion of the most appropriate refrigerants with a reduced contribution to ozone depletion and reduced GHG-equivalent concentrations will be made during detailed design based on the specific mechanical systems selected. A similar process will apply to tenant fit-out systems.

Energy Management Systems

An Energy Management System (EMS) does not reduce the design energy utilization, but rather ensures that actual operation comes as close to design optimum as practicable. An EMS allows the building manager to monitor building energy performance, which aids in identifying maintenance needs to maintain optimum performance. An EMS should, therefore, be viewed as an insurance mechanism to aid the building manager in attaining the optimum efficiency inherent in the building design.

The Burnham Building will include an EMS that will continuously monitor building mechanical equipment control points (e.g., air handlers, fans, cooling towers, chillers and boilers) including airflows, water flows, temperatures and energy consumption. This will allow building operators to optimize building energy use and will notify operators when equipment is not functioning as desired and is, thereby, wasting energy.

Tenant fit-out will be required to integrate with the building's EMS.

Enhanced Building Commissioning

Enhanced commissioning begins early in the design stage, and also includes a post-occupancy follow-up visit to ensure that building systems have been operating properly in both the heating and cooling seasons. Enhanced building commissioning insures that the building is built to the design specifications and that systems are proven to perform as expected. Building commissioning provides assurance that the building will attain the desired energy performance, whereas an EMS seeks to sustain that performance over the long run.

Construction Waste Management

The Proponent will work with the construction manager to outline, develop, and implement a comprehensive construction staging and phasing plan. Part of this plan will involve the creation of a comprehensive construction waste management plan. The Proponent is currently anticipating at least a 75% reduction in construction debris diverted to landfill (by weight).

Recycled Content Materials

The growing desire for sustainable design, guided by LEED and similar qualification programs, will encourage the specification of recycled-content materials wherever practical. Specifications will be written into Project documents requiring contractors and subcontractors to evaluate materials not only by cost, but also report recycled-materials content in relevant submittals provided to the owners or construction managers. Concrete aggregate and cement, wood, glass and glazing products, metals, masonry, and drywall will be evaluated for cost effectiveness of recycled-content alternatives.

As part of the LEED effort, the Project will have a target of at least 10% of overall construction materials costs for recycled-content materials. Via the Tenant Manual, tenants will be encouraged to make similar efforts to use recycled content materials during fit-out.

Regional Content Materials

The Proponent will encourage the specification of regionally-sourced materials wherever practical. As design progresses, the Proponent will research the achievability of 10% of all materials based on costs be regional materials. Via the Tenant Manual, tenants will be encouraged to make similar efforts to use regional content materials during fit-out.

F.2.2 Building Energy Modeling

Building energy modeling was conducted by WSP Flack+Kurtz, an internationally recognized company providing diversified engineering and design services to the real estate development and other industries. The eQUEST building energy analysis model, version 3.64, was used in accordance with the GHG Policy. The modeling for the Burnham Building included 44% of the below-grade parking garage. The balance of the parking garage area is included in the modeling of the Tower.

The modeling was conducted in accordance with ASHRAE 90.1, Appendix G. Appendix G is a protocol for the conduct of the modeling and is required for demonstration of Stretch Code compliance. In this case, since the Burnham Building is not subject to the Stretch Code, use of Appendix G should not be required but has been used as an accommodation to recent practices in MEPA GHG analyses.

Appendix G includes a number of restrictions that, while appropriate for the purpose of code compliance, exclude certain energy-efficiency and GHG reduction measures from being considered. Thus, a strict Appendix G analysis may understate the GHG reduction performance of the Proposed Case. In this analysis, these restrictions are identified and, where quantifiable, "credits" have been calculated to provide a more realistic picture of the GHG performance of the Proposed Case.

For instance, the retail and office tenants will be required to use Energy Star appliances, though the number of appliances is anticipated to be small, limited to lunch rooms or office kitchens. Most commercial electronics (display units in the retail space and computer systems, copiers, and other office equipment in the office spaces) are generally Energy Star rated and use of such rated components will be required to the extent that they serve the same purpose (see Section F.2.1.3). The electronics are expected to be a large percentage of the miscellaneous loads in this building; therefore Energy Star equipment can result in a reduction in miscellaneous loads of as much as 40% or more. To be conservative, since equipment counts are not available at this time, only a 20% reduction in miscellaneous loads is credited in the analysis as a separate line item. Though this credit would not be allowed by Appendix G in calculations for LEED credits, use of Energy Star equipment is universally encouraged as an energy efficiency and GHG reduction measure.

As indicated in Section F.1, the Baseline model uses the existing shell with code MEP systems, with the exception of the to-be-rebuilt northeast wall. In accordance with ASHRAE Appendix G, much of the potential for energy savings by tenant fit-out, although anticipated to occur, has not been estimated in this modeling as those designs are not yet available.

Furthermore, Appendix G requires that the Baseline Case MEP and lighting systems be modeled as if they were compliant with current standards (i.e.; ASHRAE 90.1-2007). Like the existing building envelope, the actual systems and lighting are decades old and much less efficient than current standards. Therefore, the real difference, in regard to a decrease in energy use and decrease in GHG emissions, between the original building and the Proposed Case cannot be recognized using the Appendix G protocol. The Proponent has not attempted to calculate this using the original MEP and lighting systems, but wishes to emphasize that Appendix G modeling does not reflect the full gains of the renovation.

Results of the Baseline and Proposed Case modeling of the Burnham Building are summarized in Table F-3. Details of the modeling inputs and copies of the eQUEST output tables are provided in Appendices 1.1 and 1.2, respectively, at the end of this attachment.

The mitigation technologies employed in the proposed design are expected to result in a 40% decrease in natural gas use and 5% decrease in electricity use, resulting in approximately a 264 ton/year, 14% decrease in GHG emissions compared to the Baseline Case.