

8.0 EFFECTS ON THE USE AND CONSERVATION OF ENERGY RESOURCES

Energy consumption will occur during construction and occupancy of the proposed residences and commercial space. During construction, energy will be used to power equipment and construction vehicles. The residences and commercial space will consume energy for space heating, air conditioning, lighting, household appliances and other electrical devices once occupied.

Electricity and gas for the Patrick Farm development will be provided by Orange and Rockland Utilities from a new underground distribution system that will be constructed to distribute electricity to the development. Actual electrical and gas demands may vary considerably based upon the lifestyles and habits of the residential occupants.

The 497 dwelling units would be inhabited by households that would place demand on various energy sources. In a residential dwelling, energy is consumed for space heating, air-conditioning, water heating, refrigerators, appliances and lighting. According to data published in the 1997 Residential Energy Consumption Survey (Source: US Department of Energy), approximately 123 million BTUs are consumed per household annually in New York State. It is expected that 497 households would consume 61.13 billion BTU¹ of energy annually.

Energy conservation is regulated at the state level. The design and plans for residential buildings must comply with the New York State Energy Conservation Construction Code.

The code specifies basic requirements that are mandatory for all residential buildings. Requirements apply to heating and cooling systems, the hot water system, electrical system, material and equipment specifications and, sealing the building envelope.

With regard to the design of building envelopes, the NYS Energy code requires that:

- insulation R-values and glazing and door U-factors be certified by the National Fenestration Rating Council (NFRC) or by using default values found in tables published in the Code.
- vapor retarders be installed in nonvented framed ceiling, wall, and floor areas.
- insulation levels for walls, roofs, and below-grade walls and glazing areas, and U-factors for windows and skylights meet or exceed minimum efficiency levels.
- air leakage be limited through the building envelope.

The NYS Energy Code also requires that water and air cooling and heating mechanical systems and equipment comply with code, and compliance is dependent on the type of mechanical equipment proposed.

¹ BTU, or British Thermal Unit, is a unit of heat equal to the amount of heat required to raise one pound of water one degree Fahrenheit at one atmosphere pressure; equivalent to 251.997 calories.

In terms of lighting standards, the NYS Energy Code requires:

- manual or automatic controls or switches that allow occupants to dim lights and turn them on or off when appropriate. The Code identifies control, switching, and wiring requirements that apply to all buildings.
- total connected loads for indoor lighting systems that do not exceed power allowances for a building. The Code demonstrates how to comply with interior-lighting power limits.
- energy-efficient exterior lighting. The Code specifies criteria for complying with exterior-lighting requirements.

The Patrick Farm project will exceed the requirements of the NYS Energy Conservation Construction Code through the installation of high efficiency lighting fixtures.

Sustainability

Sustainability is broadly defined as the level of natural resource use that can be sustained over time. Sustainability is the capability to equitably meet the vital human needs of the present without compromising the ability of future generations to meet their own needs by preserving and protecting the area's ecosystems and natural resources. The concept of sustainability describes a condition in which human use of natural resources, required for the continuation of life, is in balance with Nature's ability to replenish them.² This definition acknowledges the concept of vital human needs, of which housing is one of the most basic, and balancing this need with the preservation of resources.

The PLACE³S³ methodology, measures the total energy consumption of a specific land use. The energy sectors that PLACE³S⁴ measures includes Transportation, Residential/Commercial/Industrial, Infrastructure and Energy Production. All of these measurements involve a variety of energy types and fuels that are measured in unique units. PLACE³S converts the varied units of measurement into a standard Million British Thermal Unit equivalent (MMBtu). The PLACE³S methodology assigns the following values for the Total Operating Energy use per household.

- Average Single Family Lot - 440 MMBtu - High Residential Energy Use
- Attached Townhouse - 380 MMBtu - Medium Residential Use
- Low Rise Apartments - 360 MMBtu - Low Residential Use

As described above, sustainability is broadly defined as the level of natural resource use that can be sustained over time. Another definition of sustainability relates to the longevity of a community as a whole and it's ability to meet the needs of all members of the community. "To be sustainable over time, a community must include housing types and designs that will be desirable to buyers and renters decades from now. Those residents will be ethnically diverse,

² *Policy Guide on Planning for Sustainability*, American Planning Association, April 2000.

³ The Energy Yardstick, PLACE³S Methodology, developed for the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, August 1996.

⁴ **PL**Anning for **C**ommunity **E**nergy, **E**conomic and **E**nvironmental **S**ustainability (**PLACE³S**)

older, living in smaller households, and less likely to have children. The sustainable community must have many more housing choices than master planned communities in the past." ⁵

The need for a diversity of housing has been expressed as a stated goal in the Master Plan for the Town. The proposed Patrick Farm project would be developed to include market rate multifamily housing, workforce townhouses and emergency service worker apartments. The proposed project, as designed, meets these goals while preserving open space areas of the site and provides a limited amount of single family development.

The preservation of resources and energy sustainability is enhanced through the request for a zone change to allow for a higher density development in the central portion of the site to meet the Town's identified need for a diversity of housing.

In an effort to further reduce the energy consumption needs of the proposed project, the following measures incorporated into the project design;

Alternate Energy

The applicant would choose to utilize Solar Domestic Hot Water (SDHW) in the market rate multifamily units to the extent feasible. SDHW can reduce the cost of making hot water by 50 to 75 percent. Solar water heaters use a free renewable resource without generating pollution. Their use reduces our demand for energy from coal, oil, natural gas, and propane, creating a cleaner and safer environment. The applicant proposes to install SDHW in two of the first five multifamily units to be built-in order to insure the feasibility of this technology in this region. Once the technology has proven itself in this application, the applicant will commit to installation in additional market rate multifamily buildings.

The applicant also proposes to provide an utilize a renewable energy resource to supplement the energy needs of the community service worker apartments to be located along NYS Route 306. Both solar and geothermal technologies will be considered. A final determination as to the method of supplemental energy will be made prior to site plan approval.

Energy Efficient Building Materials

The applicant has made the commitment to provide energy efficient buildings. Building codes in the Town of Ramapo call for R-30 insulation in the roof and R-19 insulation in the walls. The applicant has committed to providing R-39 insulation in the roofs and R- 21 insulation in the walls of all multifamily units. The REScheck compliance certificate, included as Appendix V, indicates this will make the multifamily units forty six (46.1) percent more efficient than the town of Ramapo Code specifies. The applicant will comply with the most recent requirements of the Town of Ramapo Building Code to use high efficiency double pane windows, water saving devices and ecologically friendly lighting systems. In addition the applicant will consider the use of siding materials used to absorb and store solar energy, and recycled building materials to the extent practical.

⁵ A Step-by-Step Guide to Sustainability, Karen Walz, FAICP, July 2007.

Pedestrian Access

As shown in Figure 2-5, the project has been designed in a pedestrian friendly manner. There are sidewalks adjacent to all public streets. A pedestrian promenade around the farm pond in the center portion of the site, provides a pleasant and scenic pedestrian environment to encourage walking. This promenade provides a connection from the single family development in the northern portion of the site, through the multifamily development, connecting with the single family development in the southern portion of the site.

Mass Transit Access

The applicant will seek to coordinate a bus stop location within the multifamily portion of the site, a suggested location might be in the vicinity of Building 107 along Road C. Accommodation could also be made in the vicinity of lot 58 near NYS Route 306. The availability of mass transit within the project would enable residents to readily access mass transit thus reducing dependence on private vehicle trips and would make the shopping area to the north on US Route 202 more accessible without using a private auto. These efforts will be coordinated during the site plan approval process.

Employment Practices

The applicant will employ construction workers and purchase construction materials from local sources. In addition to stimulating the local economy, this practice will save in fuel by reducing the distance workers and materials have to travel to the project site.