

## **9.0 EFFECTS ON THE USE AND CONSERVATION OF ENERGY RESOURCES**

### **Potential use and conservation of energy**

The earlier sections of this DGEIS establish the scenario of the future where population growth will occur regardless of any annexation action, thereby resulting in new development in the annexation land and in existing Kiryas Joel. The resulting effects on the use and conservation of energy resources will follow that growth, either without or with the proposed annexation.

Both short-term and long-term energy consumption is typically associated with any development. Short-term energy consumption would occur during construction of new facilities and infrastructure, primarily from the consumption of fossil fuels through the operation of power equipment and construction vehicles.

Once constructed, built residential, commercial, institutional and other facilities would be occupied by users that would place long-term demands on the various energy sources that service them. In residential buildings, energy would be consumed for space heating, air-conditioning, water heating, lighting, refrigerators and other household miscellaneous appliances. Energy consumption in other buildings would occur primarily for space heating and air conditioning.

The Energy Information Administration of the US Department of Energy conducts a Residential Energy Consumption Survey (RECS) which provides statistical information on the use of household energy in the United States. The latest RECS data for New York indicates that at estimated 102.6 million BTUs<sup>1</sup> are consumed on average per household per year statewide.<sup>2</sup> It is projected then that the 3,825 households anticipated to be developed in the study area over the next ten years would consume approximately 392 billion BTUs of energy annually. The majority of the energy would come from fossil fuel consumption, which is the fuel source for most electrical power in the region.

Energy conservation measures in New York are regulated at the state level for new residential and commercial construction. New dwellings would need to be constructed in accordance with the New York State Energy Code. In effect since 2002, the code specifies basic requirements that are mandatory for newly constructed buildings. Requirements apply to heating and cooling systems, hot water systems, electrical systems, construction materials, equipment specifications and building sealing and insulation.

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<sup>1</sup> BTU, or British Thermal Unit, is a universally defined unit of measuring energy.

<sup>2</sup> U.S. Energy Information Administration, Residential Energy Consumption Survey. *Table CE1.2 Summary Household Site Consumption and Expenditures in Northeast Region, Divisions, and States - Totals and Intensities*. 2009.

Additionally, the New York State Energy Research and Development Authority and the Public Service Commission promote compliance with Energy Star® and New York Energy Smart<sup>SM</sup> programs by construction firms, building management firms and homeowners. These programs encourage the use of energy conserving appliances, materials, technologies and building techniques. Adherence to provisions of these energy conservation programs would minimize the long-term energy consumption from development.

### **Greenhouse gas (GHG) emissions as affects climate change**

Development on the annexation territory has the potential to generate greenhouse gas (GHG) emissions with or without the proposed annexation, which potentially have an adverse effect on global climate change. Development-related GHG emissions are considered to be either “direct” or “indirect” and occur from stationary and non-stationary sources that may result from the construction and operation of developed facilities.

There are six primary greenhouse gases of concern:<sup>3</sup>

- Carbon dioxide (CO<sub>2</sub>)
- Nitrous oxide (N<sub>2</sub>O)
- Methane (CH<sub>4</sub>)
- Hydrofluorocarbons (HFC's)
- Perfluorocarbons (PFC's)
- Sulfur Hexafluoride (SF<sub>6</sub>)

Carbon dioxide is estimated to make up 89 percent of greenhouse gas emissions. Carbon dioxide, nitrous oxide and methane are primarily a direct result of fuel combustion. Additional GHG sources include electric distribution, refrigerant releases (HFCs), the management of municipal solid waste, municipal wastewater and agriculture, and natural gas leakage.

This assessment of energy use and GHG addresses both direct and indirect GHG emissions.

#### *Direct GHG Emissions - Stationary and Non-Stationary Sources*

Direct GHG emissions include discharges generated from stationary sources such as combustion equipment that uses fuel oil and propane for heating and for cooking, and fixed generators utilizing diesel fuel.

Non-stationary sources of direct GHG emissions include vehicles used by the community.

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<sup>3</sup> NYSDEC *Guide for Assessing Energy Use and Greenhouse Gas Emissions* (July 2009).

As explained earlier in this DGEIS, the proposed annexation does not affect the future population of the study area as the growth will occur with or without the annexation. With growth comes additional use of stationary and non-stationary GHG sources. With the growth that is projected to occur in the study area, an incremental increase in direct GHG emissions is expected to occur from developed facilities at the same levels with or without annexation.

*Indirect GHG Emissions - Stationary and Non-Stationary Sources*

Indirect GHG emissions from stationary sources are those that are generated off-site and delivered to the locale through the public utility transmission systems. Indirect GHG emissions from non-stationary sources are those that will result in vehicle use indirectly related to the study area population, including deliveries of materials and supplies, bus trips to and from the community, and transportation of waste from the study area.

With the projected growth of the area, without or with annexation, the resulting indirect GHG emissions from stationary and non-stationary sources in the future would be the same order of magnitude.

*Evaluation of Future Projects*

Energy efficiency measures to reduce energy demand of developed projects and other measures to directly reduce GHG emissions from a project should be considered in project designs. Development plans should consider building design and operation measures and site design measures that increase efficiency or mitigate on-site GHG sources.

The following list of measures potentially applicable to activities in Kiryas Joel is taken from NYSDEC guidance.<sup>4</sup> These energy efficient measures are not regulatory requirements but often result in economic benefit to the facility owners as well as environmental benefit.

**Building Design and Operation Measures:**

- Design an energy efficient building envelop to reduce cooling/heating requirements
- Install high-efficiency HVAC systems
- Eliminate or reduce use of refrigerants in HVAC systems
- Use high-albedo roofing materials
- Maximize interior daylighting
- Incorporate window glazing to optimize daylighting, heat loss and solar heat gain
- Incorporate super insulation to minimize heat loss

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<sup>4</sup> Ibid.

- Incorporate motion sensors and lighting and climate control
- Use efficient, directed exterior lighting
- Use water conserving fixtures that exceed building code requirements
- Re-use gray water and/or collect and re-use rainwater
- Provide for storage and collection of recyclable (including paper, corrugated cardboard, glass, plastic and metals) in building design
- Re-use building materials and products
- Use building materials with recycled content
- Use building materials that are extracted and/or manufactured within the region
- Use rapidly renewable building materials
- Use wood that is locally produced and/or certified in accordance with the Sustainable Forestry Initiative or the Forestry Stewardship Council's Principles and Criteria
- Conduct 3rd party building commissioning to ensure energy performance (e.g. LEED)
- Track energy performance of building and develop strategy to maintain efficiency
- Provide construction and design guidelines to facilitate sustainable design for build-out by tenants

### Efficiency or Mitigation Measures for On-Site GHG Sources:

- Use energy efficient boilers, heaters, furnaces, incinerators, or generators
- Incorporate on-site renewable energy sources into project, such as wind or solar
- Incorporate combined heat and power (CHP) technologies
- Pursue carbon collection, capture, and reuse or sequestration

### Site Selection and Design Measure:

- Provide access to public transportation
- Minimize energy use through building orientation
- Conserve and restore natural areas on-site
- Minimize building footprint
- Design project to support alternative transportation (walking and bicycling)
- Use low impact development for stormwater design
- Design water efficient landscaping

### Transportation Measures:

- Incorporate idling reduction policies
- Join or form a Transportation Management Association
- Provide new transit service or support extension/expansion of existing transit (buses, trains, shuttles)
- Support expansion of parking at Park-n-Ride Lots and/or transit stations
- Develop or support multi-use paths to and through site

- Size parking capacity to meet, but not exceed, local parking requirements and, where possible, seek reductions in parking supply through special permits or waivers
- Pursue opportunities to minimize parking supply through shared or banked parking
- Subsidize transit passes
- Provide on-site amenities such as banks, dry cleaning, food service, childcare
- Provide bicycle storage areas
- Roadway improvements to improve traffic flow

Water Reduction or Management Measures:

- Utilize composting
- Promote and facilitate recycling
- Incorporate internal environmental accounting practices to promote waste reduction

Higher density development encourages a more walkable community, which is identified as a GHG reduction goal in the NYSDEC guidance and in the County Plan regarding green/urban centers, and is reiterated in NYSDEC's Lead Agency Determination of January 28, 2015: "Compact, high density development is more likely to result in a community that is more walk-able, bike-able and more conducive to mass transit while reducing vehicle miles traveled and generation of greenhouse gas emission from combustion. As a general rule, high density development, appropriately sited, is considered more environmentally sustainable and conserves open space." <sup>5</sup>

### **Sustainability**

The Mid-Hudson Regional Sustainability Plan<sup>6</sup> advocates making all growth Smart Growth. Future land use in Kiryas Joel can be expected to adopt a number of Smart Growth elements as have been enumerated in the Plan and elsewhere: mixing land uses in a community setting, compact building design, walkable neighborhoods, creating a distinctive community with a strong sense of place, preserve critical environmental areas, directing development towards existing communities, providing transportation choices - all of these elements foster improved accessibility, affordability, reduced traffic, consolidated infrastructure, and environmental protection as an alternative to traditional suburban sprawl.

With an emphasis on job retention and job creation in the region, the Mid-Hudson Regional Economic Development Council's Strategic Plan also highlights strategies for improving the region's economic base as well as upgrading existing facilities for

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<sup>5</sup> New York State Department of Environmental Conservation Commissioner's Determination of Lead Agency Under Article 8 of the Environmental Conservation Law. January 28, 2015. Pg. 4.

<sup>6</sup> Ecology and Environment, Inc., "Mid-Hudson Regional Sustainability Plan" Prepared for: Mid-Hudson Planning Consortium. March 2013.

improved sustainability. One goal cited in the Plan relates closely to the compact growth of Kiryas Joel: "Target regional growth in urban centers, whose compact, mixed-use development pattern creates an opportunity for growth that is sustainable, cost-effective, energy- and natural resource-conserving, climate-friendly, affordable, and attractive to young workers."<sup>7</sup>

The Council's most recent report cites a number of strategies that have been implemented in the region to revitalize the regional infrastructure, housing and urban centers.<sup>8</sup> Specific to Kiryas Joel, it cites a recent award to the Village of \$200,000 in Community Development Block Microenterprise Program funds to assist nine microenterprises and create nine jobs in Kiryas Joel.<sup>9</sup> This State program is made available to assist existing business owners and new business start-ups that pledge to create job opportunities for persons from low- to moderate-income families. In addition, the Kiryas Joel Wastewater Project is reported to be on track (with \$594,000 awarded to it) to undertake improvements to its wastewater treatment plant (see section 3.5.6). These are examples of where the Village has sought and secured targeted funds that will promote sustainability and Smart Growth.

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<sup>7</sup> Mid-Hudson Regional Economic Development Council, "Strategic Plan." 2011. Pg. 43.

<sup>8</sup> Mid-Hudson Regional Economic Development Council, "Accelerating Growth, Spearheading Success - 2014 Progress Report." 2014.

<sup>9</sup> <https://www.governor.ny.gov/news/governor-cuomo-announces-13-million-economic-development-housing-and-infrastructure-projects>. December 4, 2014.