5.H.4 NATURAL RESOURCES AND ENERGY SUPPLY

This section of the EIS for FLL provides an evaluation of the use of energy and the consumption of natural resources at the airport under Existing Conditions in 2005. The FAA recommends that the evaluation of natural resources and energy supply for project alternatives include enough detail to fully explain the projected demand for energy and natural resources, and state the measures that may be taken to minimize the impact. The proposed action and alternatives are examined to identify any proposed major changes in stationary facilities or the movement of aircraft and ground vehicles that would have a measurable affect on local supplies of energy or natural resources. For most actions, changes in energy demands or natural resource consumption would not result in significant impacts.[14] The evaluation of the demand for energy and use of natural resources under the runway development alternatives described in this EIS is provided in Chapter Six, *Environmental Consequences*, Section 6.H.4, *Natural Resources and Energy Supply*.

There are two primary sources of energy consumption at an airport – stationary facilities and aircraft operations. Stationary facilities use utility energy (electric energy and natural gas) to provide cooling, lighting, heat, and hot water to buildings, the airfield, and parking areas. Aircraft operations consume fuel energy (Jet-A fuel, low-lead aviation gasoline referred to as AVGAS, unleaded gasoline, and diesel fuel) to operate aircraft and power the ground support equipment (GSE) that service aircraft and support airport operations.[15] Airport development projects may impact the demand for energy by proposing the development of new buildings, runways, taxiways, or other on-airport facilities that could affect energy consumption.

In terms of natural resources, a construction project may require the acquisition of land, or require the removal of dirt, rock, or gravel that could deplete or destroy the supply of natural resources such as oil, coal, minerals, or trees. The assessment of the use of natural resources during construction is included in Chapter Six, *Environmental Consequences,* Section 6.H.4.

5.H.4.1 Energy Sources

Electrical power is provided to the airport by Florida Power and Light (FPL). Natural gas is provided by Peoples Gas. Fuel, such as jet fuel (JET-A and AVGAS), unleaded gasoline, and diesel fuel are provided to the airport through airport and airline contracts, and through FBO contracts with various suppliers.

[14] FAA, Order 1050.1E, *Environmental Impacts: Policies and Procedures (including Change 1)*, Appendix A, Section 13, *Natural Resources and Energy Supply*, March 20, 2006.

[15] For the purposes of this energy assessment, GSE is defined as aircraft ground support equipment as well as other types of ground access vehicles, including, but not limited to staff vehicles, shuttles, and maintenance vehicles.

5.H.4.1.1 FLORIDA POWER AND LIGHT (FPL)

FPL currently serves more than four million customers and is one of the largest and fastest-growing electric utilities in the U.S. The company added an additional 1,900 megawatts of power when the Manatee and Martin plants entered service in 2005. The current total system capability of FPL, including purchased power, is more than 22,000 megawatts (MW).[16]

Power is delivered to the airport by FPL from two power-generating plants located in Broward County, the Lauderdale Plant and the Port Everglades Plant, which deliver 859 and 1,201 MW of power,[17] respectively. The location of the two power plants is graphically depicted on **Exhibit 5.H.4-1, *Florida Power and Light (FPL) Power Generation Plants Serving Fort Lauderdale*.** Standard underground feeder lines provide 13,720 volts of electrical power to the airport transformer.[18]

An estimate of Florida's electric power needs is provided in the *FPL Ten-Year Power Plant Site Plan 2005-2014* (FPL Ten-Year Plan), which was submitted to the Florida Public Service Commission in April 2005. The FPL Ten-Year Plan includes a projection of how the energy needs will be met and a disclosure of information pertaining to preferred and potential power plant sites.

According to the FPL Ten-Year Plan's current forecast, Florida will require additional capacity of 550 MW each year through the 2012 to 2014 timeframe. The utility proposes to meet the additional capacity demand with two pulverized coal units. These units will combine highly efficient and reliable pulverized coal combustion technology with advanced emission control technology and plant design, allowing for recycling of generation byproducts into useful commercial products.

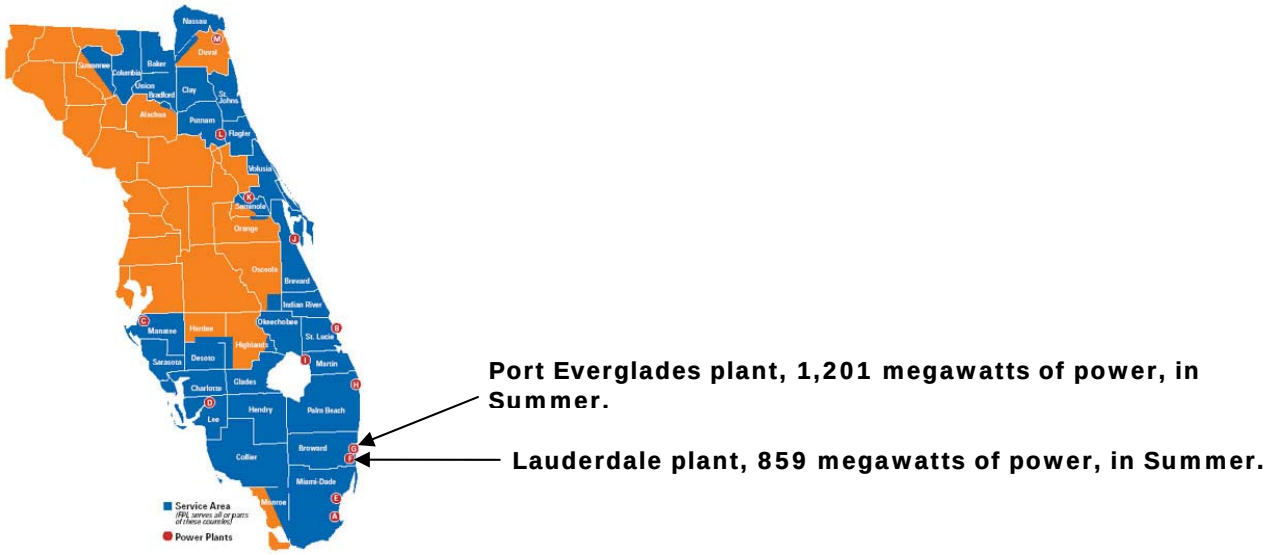
---

16 Florida Power and Light (FPL), *Changing Currents 2000-Present*, available on the FPL Web site at http://www.fpl.com/about/history/changing_currents.shtml#TopOfPage.

17 Florida Power and Light, *Ten Year Power Plant Site Plan 2005-2014*, Table I.A.1 *Capacity Resource by Unit Type*, peak power during August, Miami, Florida, April 2005.

18 Information obtained from Florida Power and Light, Wingate Service Center, Fort Lauderdale, Florida, teleconference conducted on January 7, 2005.

Exhibit 5.H.4-1
FLORIDA POWER AND LIGHT (FPL) POWER GENERATION PLANTS SERVING FORT LAUDERDALE



Source: Florida Power and Light (FPL). Data is available on the FPL Web site at www.fpl.com.

5.H.4.1.2 Peoples Gas

The Peoples Gas Company is the leading supplier of natural gas in Florida, providing service to over 300,000 customers in 29 Florida counties.[19] Peoples Gas Company requires more than 9,200 miles of system pipeline to provide service to its customers.

To meet the future natural gas needs of Florida customers, a new pipeline extending from Alabama to Florida began operating in 2002. The location of the pipeline is graphically depicted on **Exhibit 5.H.4-2, *Gulfstream Pipeline***. The new Gulfstream Natural Gas System pipeline will transport up to 1.1 billion cubic feet per day of natural gas to Florida from sources in Alabama and Mississippi.[20] This additional capacity will help ensure an adequate supply of natural gas to meet Florida's growing energy needs. The pipeline originates near Mobile, Alabama and extends 450 miles through the Gulf of Mexico, entering Florida in Manatee County. The pipeline will ultimately be extended across the state of Florida.

[19] Information provided by the Peoples Gas Web site at www.peoplesgas.com.
[20] Duke Energy, web site available at www.duke-energy.com/businesses/trans/pipelines/us/storage/gulfstream.asp.

Exhibit 5.H.4-2
GULFSTREAM PIPELINE

Source: Duke Energy, web site available on the Internet at www.duke-Energy.com/businesses/trans/pipelines/us/storage/gulfstream.asp.

5.H.4.1.3 Fuel Sources

Aviation fuel (JET-A and AVGAS), unleaded gasoline, and diesel fuel are provided to the airport through several sources. Unleaded gasoline and diesel fuel used for GSE and other ground access vehicles and equipment is obtained from local providers. FBOs at FLL provide JET-A and AVGAS for general aviation aircraft, which is obtained from Texaco, Phillips 66, Air BP, and AVFUEL, depending on the FBO. JET-A fuel, used by scheduled commercial service airlines, is stored at the FLL fuel farm, which is managed by the Aircraft Service International Group (ASIG). JET-A fuel is obtained from Air BP, Chevron, Citgo, Texaco, and Phillips 66, according to airline fuel contracts, and is stored collectively at the fuel farm. No deficiencies in the supply of fuel to the airport have been noted by Broward County.

5.H.4.2 Stationary Facilities

At FLL, electrical and natural gas energy is consumed to cool, power, and light the terminal buildings and airfield, as well as producing hot water for use in the terminal. The demand for electric power surpasses the demand for natural gas power. Electric power is required to air condition the four terminal buildings and attached concourses that cover 734,384 square feet of floor space. The three runways, associated taxiways, and apron areas require edge lights, runway centerline lights, a runway approach light system, and runway end zone lights.

5.H.4.3 Aircraft Operations

The annual aircraft landing and takeoff cycles (LTO) at FLL consume only a fraction of the aviation fuel used at the airport. The total amount of fuel required for annual aircraft operations at an airport is a function of the type of aircraft operating at the airport, the number of engines on each aircraft, and the number of annual aircraft operations of each aircraft type. Other factors include the lengths of time that aircraft are in operation on the ground, during takeoff, and during climbout, as well as the amount of fuel required for the aircraft to reach their flight destination after departure from FLL. The total demand for aircraft fuel was assumed to equal the annual throughput of JET-A and AvGas to the storage tanks at the airport. *See* Chapter Five, *Affected Environment*, Section 5.B, *Air Quality,* for details of aviation fuel throughput for the on-airport fuel storage tanks.

The fuel demand for aircraft-related GSE depends on the type of aircraft operating at the airport, type of GSE used to service the aircraft, the GSE fuel type, and the length of time required to provide service for each aircraft by each GSE unit.[21] For example, large passenger jets may require several types of equipment including catering trucks, cabin service trucks, belt loaders, cargo loaders, and an aircraft tractor, whereas, smaller air taxi aircraft may only require a ground power unit and a fuel truck.

All GSE use either unleaded gasoline or diesel fuel. The total demand for unleaded gasoline and diesel fuel was assumed to equal the annual fuel throughput to the storage tanks at the airport. Notably, the fuel throughput for the unleaded gasoline and diesel fuel storage tanks includes the fuel used by other ground access vehicles including staff cars, shuttles, and maintenance equipment. *See* Chapter Five, *Affected Environment*, Section 5.B, *Air Quality,* for details of fuel throughput for the on-airport fuel storage tanks.

5.H.4.4 Energy Requirements – 2005 Existing Conditions

A summary of the utility power and fuel demand estimated for FLL under the 2005 Existing Conditions is graphically depicted in **Table 5.H.4-1**.

[21] Specialized ground handling equipment (ground support equipment, GSE) is used to provide service to aircraft at the gate. Between arrival and departure, GSE are used to unload, clean, refuel, and load baggage along with food, water, and cargo.

Table 5.H.4-1
ANNUAL UTILITY POWER AND FUEL DEMAND –
2005 EXISTING CONDITIONS
Fort Lauderdale-Hollywood International Airport

ENERGY TYPE					
UTILITY ENERGY DEMAND		FUEL ENERGY DEMAND			
ELECTRIC (MBTU)	NATURAL GAS (MBTU)	JET-A FUEL (Gallons)	AVGAS (Gallons)	DIESEL (Gallons)	GASOLINE (Gallons)
315,056	2.37	127,776,286	5,888,875	1,000,835	390,504

Note: AvGas is low-lead aviation gasoline for general aviation aircraft.
MBTU is million BTU (British thermal unit). One BTU of heat is equal to 1/180 of the heat required to raise the temperature of one pound of water from 32 degrees Fahrenheit to 212 degrees Fahrenheit at a constant pressure of one atmosphere.

Source: Broward County Aviation Department, 2004 fuel and energy reports.
Landrum & Brown, 2007.

The airport provided reports indicating the total annual use of electric and natural gas energy during the complete 2004 calendar year in kilowatt hours (kWhr). The power units were converted to million British thermal units (MBTU) for ease in comparing the current levels to future levels of demand resulting from implementation of the No Action and runway development alternatives. *See* Chapter Six, *Environmental Consequences*, Section 6.H.4, *Natural Resources and Energy Supply*. The 2004 data was updated to 2005 levels by estimating increased use of electric power with respect to the increase in passenger enplanements.

The data in Table 5.H.4-1 indicates that the demand for electrical energy is much higher than the demand for natural gas at the airport. This would be due to the level of air conditioning required for buildings in the sub-tropical Florida climate. Natural gas energy is used to heat water and is a function of the annual number of passengers served by the airport. The demand for JET-A fuel is much higher than the demand for AVGAS. JET-A demand includes fueling commercial aircraft for flights to destinations within and outside Florida, whereas AVGAS is used primarily for relatively brief local non-commercial general aviation flights. The demand for gasoline and diesel fuels reflects the use of GSE to service aircraft at the gates, and as fuel for other ground access vehicles used at the airport.

5.H.4.5 Consumption of Natural Resources – 2005 Existing Conditions

Under the existing conditions there were no major changes to the Airport associated with the Proposed Project with regard to stationary facilities, movement of aircraft, or use of ground access vehicles. Further, there was no construction associated with the Proposed Project that occurred under the 2005 Existing Conditions that would require the use of natural resources. Consequently, there would be no effect on natural resources from either the operation or construction of

the Proposed Project under the 2005 Existing Conditions.[22] Impacts on the supply of natural resources resulting from operation and construction of the runway development alternatives are described in Chapter Six, *Environmental Consequences*, Section 6.H.4, *Natural Resources and Energy Supply*.

[22] FAA, Order 1050.1E, *Environmental Impacts: Policies and Procedures*, Appendix A, Section 13.2, March 20, 2006.

THIS PAGE INTENTIONALLY LEFT BLANK