6.H.4 NATURAL RESOURCES AND ENERGY SUPPLY

This section provides an evaluation of the use of energy and consumption of natural resources under future conditions with implementation of the No Action and runway development alternatives for 2012. The demand for energy in 2020 is provided for disclosure purposes only. The information provided in this evaluation is supported by the procedures and methodology described in Appendix O.2, *Natural Resources and Energy Supply*.

When planning airport improvement projects, FAA policy recommends that facility development include principles of sustainability in design. The FAA encourages the consideration of energy reduction measures in the planning and design of airport improvement projects. These principles are consistent with the governmental policy[5] and NEPA regulations that require all agencies to, "utilize a systematic interdisciplinary approach, which will ensure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision-making."[6]

The evaluation of the future demand for energy and natural resources was evaluated as described for the 2005 Existing conditions presented in Chapter Five, *Affected Environment*, Section 5.H.4, *Natural Resources and Energy Supply*.

6.H.4.1 Stationary Facilities

The demand for electric and natural gas power in 2012 and 2020 was assumed to increase regardless of implementation of the runway development alternatives. An increase in annual passengers would occur in the future without changes to any of the airport's stationary facilities. Therefore, the demand for electric and natural gas for the future baseline years were projected based on the increase in annual passengers served at FLL.

Additional power would be required in 2012 and 2020 with implementation of the runway development alternatives. Each runway development alternative for 2012 includes the same 785,003 square feet of new passenger terminal space. In 2020, each runway development alternative includes 67,355 square feet of new passenger terminal space. Therefore in 2020, there would be a total of 852,358 square feet of new terminal space that would require air conditioning and hot water for all of the runway development alternatives.

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[5] Executive Order 13123, *Greening the Government Through Efficient Energy Management*, published at Federal Register Volume 64, Page 30851 (64 FR 30851), dated June 8, 1999, as stated in FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures (including Change 1)*, Appendix A, Section 13, *Natural Resources and Energy Supply*, March 20, 2006.

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

An increased demand for electric power to light the redeveloped runways and supporting airfield improvements would vary depending on the runway development alternative. The airfield improvements proposed under each runway development alternative[7] were evaluated for both 2012 and 2020.

6.H.4.2 Aircraft Operations

The demand for fuel in future years was assumed to increase for all alternatives. Based on the aviation forecasts presented in Chapter Three*, Purpose and Need*, there would be an increase in aircraft operations in the future that would occur with or without changes to the airfield. This increase in aircraft operations would increase the fuel required for operation of aircraft, ground support equipment (GSE), and other airport support vehicles. The demand for aviation fuel (JET-A, and aviation gasoline, AvGas), unleaded gasoline, and diesel fuel for the No Action Alternative (Alternative A) in 2012 and 2020 was projected based on this forecast increase in annual operations and is used as the baseline for comparison of the runway development alternatives.

The forecast increase in annual aircraft operations under all 2012 alternatives, including the No Action Alternative, is the same. Similarly, the forecast increase in annual aircraft operations under all 2020 alternatives, including the No Action Alternative, is the same. The increase in aircraft operations would cause an increase in aircraft departure queue delay for the baseline condition. This increase in delay time would increase the demand for JET-A and Avgas.

Future demand for fuel would increase and vary by runway development alternative including the No Action Alternative. The airfield configurations and runway use proposed under each runway development alternative would cause different average taxi times and departure queue delay times. These changes in aircraft taxi and delay times would affect the demand for JET-A and AvGas. The impact of the airfield layout on fuel consumption was evaluated for each runway development alternative in 2012.

6.H.4.3 Assessment Procedures And Results

A summary of the energy demand for all of the alternatives is provided in **Table 6.H.4-1, *Annual Energy Demand – 2012 and 2020***. The power demand values with the 2020 alternatives are provided for disclosure purposes only.

The data in Table 6.H.4-1 show the demand for electrical energy would increase with all alternatives. Each runway development alternative would require additional power to cool the new terminal additions and to light the airfield. The demand for natural gas power is the same for each runway development alternative. All runway development alternatives include the same additional terminal space that would need to be cooled and provided with hot water.

[7] Except for Alternative B1b and B1c, which propose the exact same airfield configuration.

Table 6.H.4-1
ANNUAL ENERGY DEMAND – 2012 AND 2020
Fort Lauderdale-Hollywood International Airport

ALTERNATIVES	UTILITY POWER DEMAND (MBTU/yr)		FUEL TYPE AND ANNUAL THROUGHPUT (millions of gallons)			
	ELECTRIC	NATURAL GAS	JET-A	AVGAS	GASOLINE	DIESEL
2012 ALTERNATIVES						
A (No Action)	396,542	2.98	160.3	5.146	0.43	1.11
B1	617,924	3.20	156.7	5.123		
B1b[1]	618,103		156.5	5.122		
B1c[1]	618,103		157.9	5.130		
B4	617,171		156.0	5.118		
B5	617,380		156.7	5.123		
C1	619,154		159.4	5.140		
D1	618,103		156.5	5.122		
D2	617,171		156.0	5.118		
2020 ALTERNATIVES						
A (No Action)	498,905	3.75	203.2	5.994	0.52	1.33
B1	739,168	6.49	190.5	5.917		
B1b	739,347		190.3	5.915		
B1c	739,347		190.3	5.915		
B4	738,415		190.0	5.914		
B5	738,624		190.5	5.917		
C1	740,399		194.5	5.941		
D1	741,123		193.5	5.935		
D2	740,976		192.4	5.929		

Note: MBTU/yr is million British thermal units per year.
JET-A fuel is used for jet- and turboprop-engine aircraft; AVGAS is low-lead aviation gasoline used for small general aviation aircraft powered by piston engines.

The full build-out of Alternative D1 could not occur until 2020. The 2012 Alternative D1 includes the implementation of Alternative B1b. The 2020 Alternative D1 includes the implementation of Alternative B1b, followed in subsequent years by the implementation of a second parallel runway north of Runway 9L/27R with the same physical configuration as Alternative C1.. The 2020 Alternative D1 combines the benefits associated with both Alternative B1b and Alternative C1. *See* Chapter Four, *Alternatives*, Section 4.2.2.6, *Runway Development Alternatives Screening Results*, Subsection, *D Alternatives – South and North Airfield Development*.

The full build-out of Alternative D2 could not occur until 2020. The 2012 Alternative D2 includes the implementation of Alternative B4. The 2020 Alternative D2 includes the implementation of Alternative B4, followed in subsequent years by the implementation of a second parallel runway north of Runway 9L/27R with the same physical configuration as Alternative C1.. The 2020 Alternative D2 combines the benefits associated with both Alternative B4 and Alternative C1. *See* Chapter Four, *Alternatives*, Section 4.2.2.6, *Runway Development Alternatives Screening Results*, Subsection, *D Alternatives – South and North Airfield Development*.

[1] Alternative B1c – 2012 includes aircraft noise abatement measures that would increase average aircraft taxi time and increasing the demand for aviation fuel above the level estimated for Alternative B1b.

Source: Broward County, 2005.
Landrum & Brown analysis, 2007.

The demand for JET-A and AvGas would increase correspondingly to the taxi time and aircraft departure queue delay determined for each runway development alternative (*See* Appendix O.2, *Natural Resources and Energy Supply*). The demand for gasoline and diesel fuel would increase correspondingly to the forecast increase in annual aircraft operations.

The impact of the runway development alternatives on energy demand in 2012 is summarized in **Table 6.H.4-2**, ***2012 Energy Demand Impacts - Change in Energy Demand Versus the 2012 No Action Alternative***. The demand for energy for each alternative was compared to the 2012 No Action Alternative (Alternative A). The difference in demand between the 2012 No Action and the energy demand for each runway development alternative equates to the net impact on energy supply. In 2012, the greatest demand would be for electrical energy to support the additional terminal space proposed. The increase in demand for natural gas was minimal because it is the least used fuel/energy source at FLL.

In 2012, the demand for JET-A and AvGas decreased with each runway development alternative. This decrease is due to net decrease in combined taxi time and aircraft departure queue delay time with redevelopment of the runway and taxiway system. No change in the demand for gasoline or diesel fuel would occur with implementation of any of the runway development alternatives. As described in Section 5.H.4.3, *Aircraft Operations*, gasoline and diesel fuel are used by GSE and other ground support vehicles. The increase in their use in the future is tied to the forecast increase in aircraft operations, which remains the same for all 2012 alternatives. Changes in aircraft taxi time or delay time would not influence the use of GSE or other airport support vehicles.

Table 6.H.4-2
2012 ENERGY DEMAND IMPACTS - CHANGE IN ENERGY DEMAND VERSUS THE 2012 NO ACTION ALTERNATIVE[1]
Fort Lauderdale-Hollywood International Airport

ALTERNATIVES	ENERGY TYPE					
	CHANGE IN UTILITY POWER DEMAND (MBTU/yr)		CHANGE IN FUEL DEMAND (millions of gallons)			
	ELECTRIC	NATURAL GAS	JET A	AVGAS	GASOLINE	DIESEL
B1	221,382	0.22	-3.5	-0.023	0.00	0.00
B1b	221,561	0.22	-3.8	-0.024	0.00	0.00
B1c	221,561	0.22	-2.4	-0.015	0.00	0.00
B4	220,629	0.22	-4.3	-0.027	0.00	0.00
B5	220,838	0.22	-3.6	-0.023	0.00	0.00
C1	222,612	0.22	-0.8	-0.005	0.00	0.00
D1	221,561	0.22	-3.8	-0.024	0.00	0.00
D2	220,629	0.22	-4.3	-0.027	0.00	0.00

Note: MBTU/yr is million British thermal units per year.
JET-A fuel is used for jet- and turboprop-engine aircraft; AVGAS is low-lead aviation gasoline used for small general aviation aircraft powered by piston engines.

The full build-out of Alternative D1 is not anticipated to occur until 2020. The 2012 Alternative D1 includes the implementation of Alternative B1b. The 2020 Alternative D1 includes the implementation of Alternative B1b, followed in subsequent years by the implementation of a second parallel runway north of Runway 9L/27R with the same physical configuration as Alternative C1.. The 2020 Alternative D1 combines the benefits associated with both Alternative B1b and Alternative C1. *See* Chapter Four, *Alternatives*, Section 4.2.2.6, *Runway Development Alternatives Screening Results*, Subsection, *D Alternatives – South and North Airfield Development*.

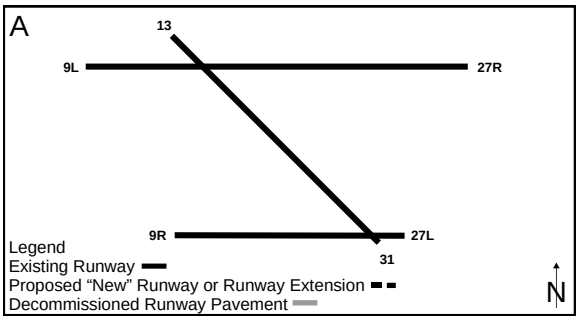
The full build-out of Alternative D2 is not anticipated to occur until 2020. The 2012 Alternative D2 includes the implementation of Alternative B4. The 2020 Alternative D2 includes the implementation of Alternative B4, followed in subsequent years by the implementation of a second parallel runway north of Runway 9L/27R with the same physical configuration as Alternative C1.. The 2020 Alternative D2 combines the benefits associated with both Alternative B4 and Alternative C1. *See* Chapter Four, *Alternatives*, Section 4.2.2.6, *Runway Development Alternatives Screening Results*, Subsection, *D Alternatives – South and North Airfield Development*.

[1] Negative values indicate a decrease in demand for energy as compared to the 2012 No Action Alternative; a positive value indicates an increase in the energy demand.

Note: MBTU/yr is million British thermal units per year.

Source: Landrum & Brown analysis, 2007.

6.H.4.3.1 ALTERNATIVE A: NO ACTION



Alternative A assumes no changes to the airfield. The 2012 No Action condition includes the forecast increase in aircraft operations which would occur regardless of whether the runway development alternatives are implemented. This forecast increase in annual aircraft operations would result in increased use of GSE, Auxiliary Power Units (APUs), and the volume of consumed fuel at FLL in 2012.

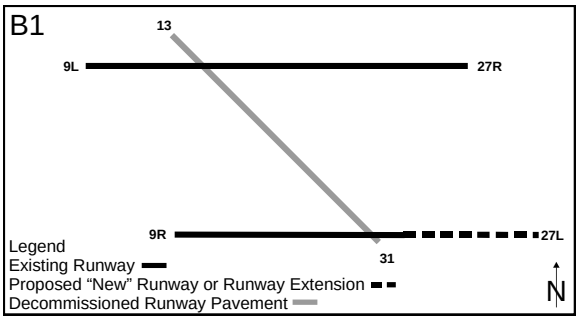
Table 6.H.4-3, *Alternative A (No Action) – 2012 Annual Energy Demand*, indicates the demand for electricity would exceed the use of natural gas at the airport, due to the need to air condition the terminal buildings because of southern Florida's sub-tropical climate. The demand for JET-A fuel would be much higher than the requirement for AVGAS, due to the operation of more large jet aircraft than small general aviation aircraft. Jet aircraft are fueled for longer flights than small general aviation or commuter aircraft. The majority of fuel consumed at the airport for GSE would be primarily diesel fuel.

Table 6.H.4-3
ALTERNATIVE A (NO ACTION) – 2012 ANNUAL ENERGY DEMAND
Fort Lauderdale-Hollywood International Airport

ENERGY TYPE					
UTILITY POWER DEMAND (MBTU)		**FUEL DEMAND** (millions of gallons)			
ELECTRIC	**NATURAL GAS**	**JET-A FUEL**	**AVGAS**	**GASOLINE**	**DIESEL**
396,542	2.98	160.3	5.146	1.11	0.43

Source: Landrum & Brown analysis, 2007.

6.H.4.3.2 ALTERNATIVE B1 REDEVELOP AND EXTEND EXISTING RUNWAY 9R/27L TO AN 8,600-FOOT BY 150-FOOT ELEVATED RUNWAY



Alternative B1 includes a 3,324-foot extension of Runway 27L. The number of annual aircraft operations forecast to occur with Alternative B1 are the same as for the 2012 No Action Alternative (Alternative A). Redevelopment of Runway 9R/27L and changes in the runway use would change the demand for fuel from that given under 2012 Alternative A. With implementation of Alternative B1, average aircraft taxi time would increase above the 2012 baseline level due to the extended location of the end of Runway 27L. The additional aircraft taxi time required between the terminal and the end of Runway 27L would cause an increase in the demand for JET-A and AvGas. Due to the availability of a longer south runway, there would be a decrease in departure queue delay times. The decrease in departure queue delay times under Alternative B1 would offset additional fuel consumption resulting from increased taxi times. Therefore, there would be a net decrease in aircraft operating time under Alternative B1 compared to 2012 Alternative A.

Alternative B1 includes construction of 785,003 square feet of new terminal area. This additional terminal space would require cooling and hot water which would increase the demand for electric and natural gas power in 2012.

Table 6.H.4-4, *Alternative B1 – 2012 Annual Energy Demand*, indicates the demand for electricity would exceed the use of natural gas at FLL in 2012, due to the need to air condition the terminal buildings because of southern Florida's sub-tropical climate. The demand for JET-A fuel would be much higher than the demand for AVGAS, due to the operation of more large jet aircraft than small general aviation aircraft. The majority of fuel consumed to operate GSE would be diesel fuel.

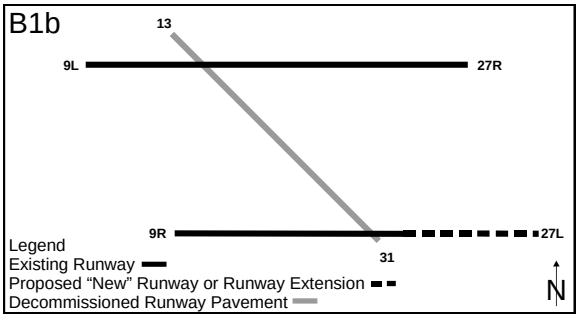
Table 6.H.4-4
ALTERNATIVE B1 – 2012 ANNUAL ENERGY DEMAND
Fort Lauderdale-Hollywood International Airport

ENERGY TYPE					
UTILITY ENERGY DEMAND (MBTU)		FUEL ENERGY DEMAND (millions of gallons)			
ELECTRIC	NATURAL GAS	JET-A FUEL	AVGAS	GASOLINE	DIESEL
617,924	3.20	156.7	5.123	0.43	1.11

Source: Landrum & Brown analysis, 2007.

Overall, the demand for utility energy would increase 63.1 percent (55.8 percent for electric and 7.3 percent for natural gas). The demand for fuel would decrease by 2.6 percent (2.2 percent decrease for JET-A and 0.4 percent decrease for AvGas).

6.H.4.3.3 ALTERNATIVE B1b: REDEVELOP AND EXTEND EXISTING RUNWAY 9R/27L TO AN 8,000-FOOT BY 150-FOOT ELEVATED RUNWAY WITH EMAS



Alternative B1b includes a 2,724-foot extension of Runway 27L. The number of annual aircraft operations forecast to occur with Alternative B1b are the same as for the 2012 Alternatives A and B1. Redevelopment of Runway 9R/27L and changes in the runway use would change the demand for fuel from that given under 2012 Alternative A. With implementation of Alternative B1b, average aircraft taxi time would increase above the 2012 baseline level due to the extended location of the end of Runway 27L. The additional aircraft taxi time required between the terminal and the end of Runway 27L would cause an increase in the demand for JET-A and AvGas. Due to the availability of a longer south runway, there would be a decrease in departure queue delay times. The decrease in departure queue delay times under Alternative B1b would offset additional fuel consumption resulting from increased taxi times. Therefore, there would be a net decrease in aircraft operating time under Alternative B1b compared to 2012 Alternative A.

Alternative B1b includes construction of 785,003 square feet of new terminal area. This additional terminal space would require cooling and hot water which would increase the demand for electric and natural gas power in 2012.

Table 6.H.4-5, *Alternative B1b – 2012 Annual Energy Demand*, indicates the demand for electricity would far exceed the use of natural gas at FLL in 2012, due to the need to air condition the terminal buildings because of Florida's sub-tropical climate. The demand for JET-A fuel would be much higher than the demand for AVGAS, due to the operation of more large jet aircraft than small general aviation aircraft. The majority of fuel consumed to operate GSE would be diesel fuel.

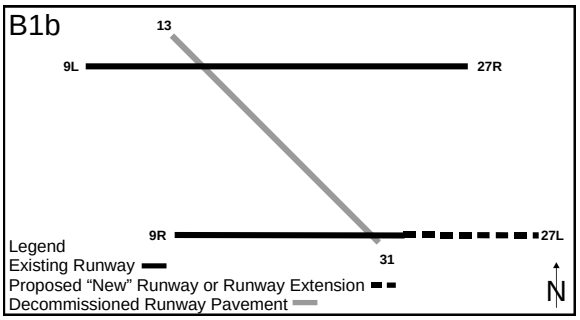
Table 6.H.4-5
ALTERNATIVE B1b – 2012 ANNUAL ENERGY DEMAND
Fort Lauderdale-Hollywood International Airport

ENERGY TYPE					
UTILITY ENERGY DEMAND (MBTU)		FUEL ENERGY DEMAND (millions of gallons)			
ELECTRIC	NATURAL GAS	JET A FUEL	AVGAS	GASOLINE	DIESEL
618,103	3.20	156.5	5.122	0.43	1.11

Source: Landrum & Brown analysis, 2007.

Overall, the demand for utility energy would increase 63.2 percent (55.9 percent for electric and 7.3 percent for natural gas). The demand for fuel would decrease by 2.9 percent (2.4 percent decrease for JET-A and 0.5 percent decrease for AvGas).

6.H.4.3.4 ALTERNATIVE B1c: (AIRPORT SPONSOR'S PROPOSED PROJECT): REDEVELOP AND EXTEND EXISTING RUNWAY 9R/27L TO AN 8,000-FOOT BY 150-FOOT ELEVATED RUNWAY WITH EMAS; RUNWAY USE DETERMINED BY BROWARD COUNTY'S INTERLOCAL AGREEMENTS



Alternative B1c includes the same 2,724-foot extension of Runway 27L as Alternative B1b. This alternative incorporates Broward County's Interlocal Agreements. Similar to Alternative B1b, implementation of Alternative B1c would result in an increase in average aircraft taxi time above the 2012 baseline level due to the extended location of the end of Runway 27L. The additional aircraft taxi time required between the terminal and the end of Runway 27L would cause an increase in the demand for JET-A and AvGas. However, due to the availability of a longer south runway, there would be a decrease in departure queue delay times. The Interlocal Agreements limit the use of the south runway by certain sized aircraft, the direction of arrival and departure, and the time of day departures are

allowed. Continued enforcement of the Interlocal Agreements may contribute to increased departure queue delay, which may offset a decrease in queue delay times gained by the added length of Runway 9R/27L. The decrease in departure queue delay times under Alternative B1c would offset additional fuel consumption resulting from increased taxi times. Therefore, there would be a net decrease in aircraft operating time under Alternative B1c compared to 2012 Alternative A.

Alternative B1b includes construction of 785,003 square feet of new terminal area. This additional terminal space would require cooling and hot water which would increase the demand for electric and natural gas power in 2012.

Table 6.H.4-6, *Alternative B1c – 2012 Annual Energy Demand*, indicates the demand for electricity would far exceed the use of natural gas at FLL in 2012, due to the need to air condition the terminal buildings because of Florida's sub-tropical climate. The demand for JET-A fuel would be much higher than the demand for AVGAS, due to the operation of more large jet aircraft than small general aviation aircraft. The majority of fuel consumed to operate GSE would be diesel fuel.

Table 6.H.4-6
ALTERNATIVE B1c – 2012 ANNUAL ENERGY DEMAND
Fort Lauderdale-Hollywood International Airport

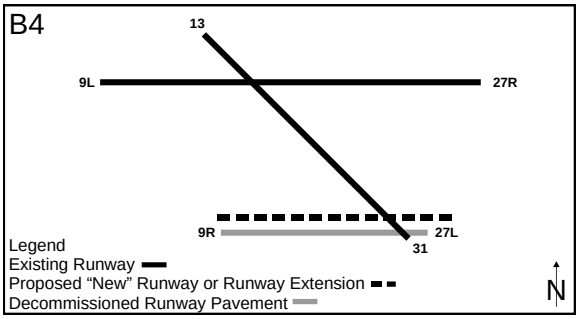
ENERGY TYPE					
UTILITY ENERGY DEMAND (MBTU)		FUEL ENERGY DEMAND (millions of gallons)			
ELECTRIC	NATURAL GAS	JET-A FUEL	AVGAS	GASOLINE	DIESEL
618,103	3.20	157.9	5.130	0.43	1.11

Note: Alternative B1c – 2012 includes aircraft noise abatement measures not included in Alternative B1b – 2012, which increase aircraft delay time on the ground.

Source: Landrum & Brown analysis, 2007.

Overall, the demand for utility energy would increase 63.2 percent (55.9 percent for electric and 7.3 percent for natural gas). However, the demand for fuel would decrease by 1.8 percent (1.5 percent decrease for JET-A and 0.3 percent decrease for AvGas).

6.H.4.3.5 ALTERNATIVE B4: BUILD A 6,001-FOOT AT GRADE RUNWAY WITH EMAS LOCATED 340 FEET NORTH OF EXISTING SOUTH RUNWAY (TO REPLACE EXISTING RUNWAY 9R/27L)



Alternative B4 includes redevelopment of Runway 9R/27L at a location 340 feet north of its present position. The redeveloped runway would be 724 feet longer, resulting in an overall decrease in average aircraft taxi time between the runway and the terminal. Alternative B4 assumes the same forecast of annual aircraft operations as Alternatives A, B1, B1b, and B1c. With implementation of Alternative B4, average aircraft taxi time would decrease below the 2012 baseline level due to the closer proximity of the runway to the terminal. This decrease in aircraft taxi time would result in a decrease in the demand for JET-A and AvGas. However, due to the availability of a longer south runway, there would be a decrease in departure queue delay times. The decrease in departure queue delay times with Alternative B4 would offset additional fuel consumption resulting from increased taxi times. Therefore, there would be a net decrease in aircraft operating time under Alternative B4 compared to 2012 Alternative A.

Alternative B4 includes construction of 785,003 square feet of new terminal area. This additional terminal space would require cooling and hot water which would increase the demand for electric and natural gas power in 2012.

Table 6.H.4-7, *Alternative B4 – 2012 Annual Energy Demand*, indicates the demand for electricity would far exceed the use of natural gas at FLL in 2012, due to the need to air condition the terminal buildings because of Florida's sub-tropical climate. The demand for JET-A fuel would be much higher than the demand for AVGAS, due to the operation of more large jet aircraft than small general aviation aircraft. The majority of fuel consumed to operate GSE would be diesel fuel.

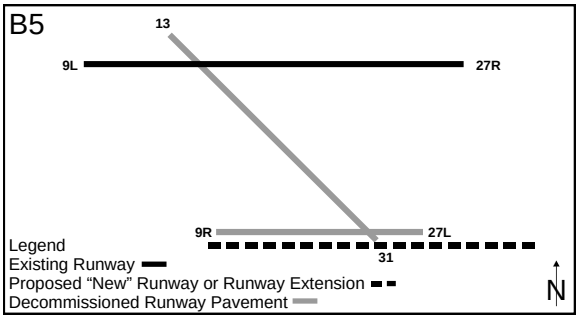
Table 6.H.4-7
ALTERNATIVE B4 – 2012 ANNUAL ENERGY DEMAND
Fort Lauderdale-Hollywood International Airport

ENERGY TYPE					
UTILITY ENERGY DEAMND (MBTU)		FUEL ENERGY DEMAND (millions of gallons)			
ELECTRIC	NATURAL GAS	JET-A FUEL	AVGAS	GASOLINE	DIESEL
617,171	3.20	156.0	5.118	0.43	1.11

Source: Landrum & Brown analysis, 2007.

The demand for utility energy would increase 63.9 percent (55.6 percent for electric and 7.3 percent for natural gas). The demand for fuel would decrease by 3.2 percent (2.7 percent decrease for JET-A and 0.5 percent decrease for AvGas).

6.H.4.3.6 ALTERNATIVE B5: BUILD A 7,800-FOOT ELEVATED RUNWAY WITH EMAS LOCATED 320 FEET SOUTH OF EXISTING SOUTH RUNWAY (TO REPLACE EXISTING RUNWAY 9R/27L)



Alternative B5 includes redevelopment of Runway 9R/27L at a location 320 feet south of its current position. The redeveloped runway would be 2,524 feet longer the existing Runway 9R/27L. Alternative B5 assumes the same forecast of annual aircraft operations as Alternatives A, B1, B1b, B1c, and B4. With implementation of Alternative B5, average aircraft taxi time would increase above the 2012 baseline level due to increased distance between the terminal and Runway 9R/27L. The additional aircraft taxi time would cause an increase in the demand for JET-A and AvGas. However, due to the availability of a longer south runway, there would be a decrease in departure queue delay times. The decrease in departure queue delay times under Alternative B5 would offset additional fuel consumption resulting from increased taxi times. Therefore, there would be a net decrease in aircraft operating time under Alternative B5 compared to 2012 Alternative A.

Alternative B5 includes construction of 785,003 square feet of new terminal area. This additional terminal space would require cooling and hot water which would increase the demand for electric and natural gas power in 2012.

Table 6.H.4-8, *Alternative B5 – 2012 Annual Energy Demand*, indicates the demand for electricity would far exceed the use of natural gas at FLL in 2012, due to the need to air condition the terminal buildings because of Florida's sub-tropical climate. The demand for JET-A fuel would be much higher than the demand for AVGAS, due to the operation of more large jet aircraft than small general aviation aircraft. The majority of fuel consumed to operate GSE would be diesel fuel.

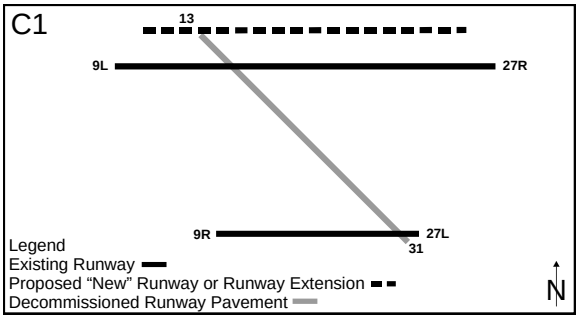
Table 6.H.4-8
ALTERNATIVE B5 – 2012 ANNUAL ENERGY DEMAND
Fort Lauderdale-Hollywood International Airport

ENERGY TYPE					
UTILITY ENERGY DEMAND (MBTU)		FUEL ENERGY DEMAND (millions of gallons)			
ELECTRIC	NATURAL GAS	JET-A FUEL	AVGAS	GASOLINE	DIESEL
617,380	3.20	156.7	5.123	0.43	1.11

Source: Landrum & Brown analysis, 2007.

The demand for utility energy would increase 63.0 percent (55.7 percent for electric and 7.3 percent for natural gas). The demand for fuel would decrease by 2.7 percent (2.3 percent decrease for JET-A and 0.4 percent decrease for AvGas).

6.H.4.3.7 ALTERNATIVE C1: BUILD A 7,721-FOOT AT GRADE RUNWAY LOCATED 850 FEET NORTH OF EXISTING RUNWAY 9L/27R (A DEPENDENT PARALLEL RUNWAY TO EXISTING RUNWAY 9R/27L)



Alternative C1 includes pre-development of a new north runway, Runway 8/26, 7,721-feet long and located 850 feet north of existing Runway 9L/27R. Alternative C1 assumes the same forecast of annual aircraft operations as Alternatives A, B1, B1b, B1c, B4, and B5. Use of Runway 8/26 would result in an increase in average aircraft taxi time, due to its location farther away from the terminal. The additional aircraft taxi time would cause an increase in the demand for JET-A and AvGas. However, due to the availability of a second parallel north runway, there would be a decrease in departure queue delay times. The decrease

in departure queue delay times under Alternative C1 would offset additional fuel consumption resulting from increased taxi times. Therefore, there would be a net decrease in aircraft operating time under Alternative C1 compared to 2012 Alternative A.

Alternative C1 includes construction of 785,003 square feet of new terminal area. This additional terminal space would require cooling and hot water which would increase the demand for electric and natural gas power in 2012.

The data in **Table 6.H.4-9, *Alternative C1 – 2012 Annual Energy Demand***, show the demand for electricity would far exceed the use of natural gas at the airport. This is because of the need for electric cooling in Florida's sub-tropical climate. The demand for JET-A fuel would be much higher than the requirement for AVGAS. This is because the airport operates many more large jet aircraft than small general aviation aircraft that use AVGAS. In addition, jet aircraft are fueled for longer flights than are the small GA or commuter aircraft. The majority of fuel consumed at the airport for GSE would be primarily diesel fuel.

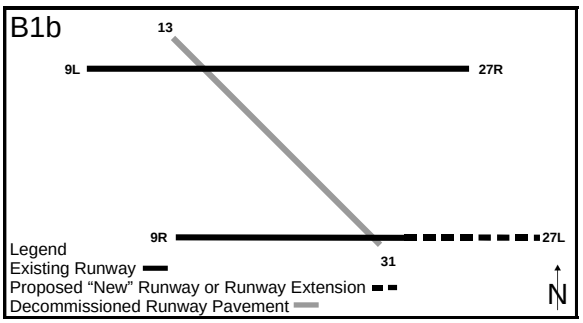
Table 6.H.4-9
ALTERNATIVE C1 – 2012 ANNUAL ENERGY DEMAND
Fort Lauderdale-Hollywood International Airport

ENERGY TYPE					
UTILITY ENERGY DEMAND (MBTU)		FUEL ENERGY DEMAND (millions of gallons)			
ELECTRIC	NATURAL GAS	JET-A FUEL	AVGAS	GASOLINE	DIESEL
619,154	3.20	159.4	5.140	0.43	1.11

Source: Landrum & Brown analysis, 2007.

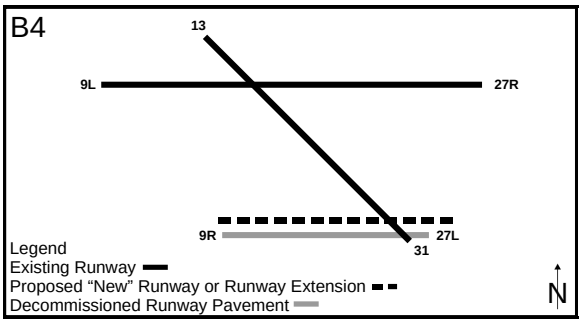
Overall, the demand for utility energy would increase 63.4 percent (56.1 percent for electric and 7.3 percent for natural gas). However, the demand for fuel would decrease by 0.6 percent (0.5 percent decrease for JET-A and 0.1 percent decrease for AvGas).

6.H.4.3.8 2012 ALTERNATIVE D1: REDEVELOP AND EXTEND EXISTING RUNWAY 9R/27L TO AN 8,000-FOOT BY 150-FOOT ELEVATED RUNWAY WITH EMAS (same as 2012 Alternative B1b)



Alternative D1 includes the development of two runways. The first phase of Alternative D1 has the same runway configuration as Alternative B1b, therefore in 2012 the energy impacts for Alternative D1 would be the same as for the 2012 Alternative B1b (*see* Section 6.H.4.3.3). The full build-out of Alternative D1 is not anticipated to occur until 2020 and includes the construction of a second parallel runway north of Runway 9L/27R with the same physical configuration as Alternative C1.

6.B.2.3.9 2012 ALTERNATIVE D2: BUILD A 6,001-FOOT AT GRADE RUNWAY WITH EMAS LOCATED 340 FEET NORTH OF EXISTING SOUTH RUNWAY (TO REPLACE EXISTING RUNWAY 9R/27L) (same as 2012 Alternative B4)



Alternative D2 includes the development of two runways. The first phase of Alternative D2 has the same runway configuration as Alternative B4, therefore in 2012 the energy impacts for Alternative D2 would be the same as for the 2012 Alternative B1b (*see* Section 6.H.4.3.5). The full build-out of Alternative D2 is not anticipated to occur until 2020 and includes the construction of a second parallel runway north of Runway 9L/27R with the same physical configuration as Alternative C1.

6.H.4.4 Consumption of Natural Resources

NEPA requires an evaluation of the need for natural resources in short supply that may be depleted by the construction required to implement a proposed Federal action.

No irreversible or irretrievable commitments of natural resources are anticipated for construction of the runway development alternatives. There would be no depletion of materials in short supply or substantial irreversible changes to the natural or cultural environment. While the source of the fill need to support an elevated runway at FLL is not yet known, there are several potential sources, including obtaining fill from quarries in Miami-Dade County or utilizing dredge materials from Port Everglades. If the dredge material could be used, it would create a beneficial use of resources. If material would be needed from quarries, there are several limestone quarries located in Miami-Dade County that could serve as a source for the embankment material needed for the construction of proposed runways and safety areas.

Construction impacts are discussed in Chapter Six, *Environmental Consequences* Section 6.H.5, *Construction Impacts*. Disposal of construction-related materials is discussed in Chapter Six, *Environmental Consequences*, Section 6.G.1, *Hazardous Materials*, and Section 6.G.2, *Solid Waste*.

6.H.4.5 Conclusion

Evaluation of the future energy and fuel demands does not indicate the use or consumption of energy or fuel sources that would be in short supply in the vicinity of FLL. Each of the runway development alternatives could increase the demand for utility power while decreasing the demand for fuel.

Alternative B4 would result in the smallest increase in electricity use of the runway development alternatives when compared to the No Action Alternative in 2012. This alternative would result in the greatest decrease in the demand for fuel, as compared to the other runway development alternatives in 2012. This decrease would be due to the closeness of redeveloped Runway 9R/27L to the terminal area. The location of the runway closer to the terminal area would greatly reduce taxi time. Alternative B4 would have the least impact on the amount of energy supplied to FLL.

Alternative C1 would result in the largest increase in electricity use and would have the greatest impact on the amount of energy supplied to FLL. Alternative C1 would cause an increase in utility energy comparable to the other runway development alternatives. However, this alternative would result in a small decrease in the demand for fuel, as compared to the other alternatives. This decrease would be due to the distance between Runway 8/26 and the terminal area. The location of Runway 8/26 would increase taxi time.

FPL and Peoples Gas were contacted and informed of the estimated increase in power demand due to the proposed project. Copies of the letters sent to both power companies are provided in Appendix O.2, *Natural Resources and Energy Supply*. Communication with the power companies was initiated pursuant to FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, where the FAA is required to contact the airport's energy suppliers to determine if projected demands can be met by the power company's existing or planned facilities.

Neither power company responded to FAA indicating an inability to meet the estimated increase in power demand. Therefore, based on the improvements outlined in FPL's *Ten-Year Power Plant Site Plan 2005-2014* (*See* Chapter Five, *Affected Environment*, Section 5.H.4.1, *Energy Sources*), the FAA assumes that FPL could accommodate the increased demand for electricity to the airport through 2020. Further, the Gulfstream Natural Gas Pipeline, operated by the Peoples Gas Company since 2002, is assumed to be capable of providing ample natural gas to FLL to meet the anticipated demand through 2020. Consequently, the increase in future energy and fuel demand resulting from any of the alternatives would not adversely affect future power and fuel supplies or the supply of natural resources.