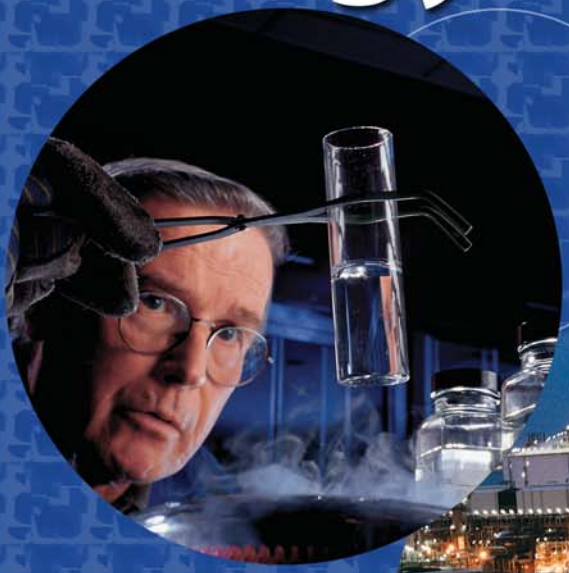
Florida's Energy Plan



January 17, 2006

Department of Environmental Protection

Table of Contents

"An adequate, reliable, diverse, efficient and affordable energy supply, coupled with a long-term commitment to energy conservation, is vital for maintaining Florida's growing economy and quality of life."

- Colleen M. Castille

Secretary
Department of Environmental Protection

January 17, 2006

Governor Jeb Bush
The Capitol
402 South Monroe Street
Tallahassee, Florida 32399

Dear Governor Bush:

Since your issuance of Executive Order #05-241 on November 10, 2005, the Department of Environmental Protection has worked diligently to gather information toward a comprehensive energy plan for the State of Florida. As directed in your Order, the Department explored options for diversifying Florida's electric generation capacity, increasing and diversifying transportation fuel supply and increasing the State's conservation and efficiency initiatives.

Nationwide, demand for energy and transportation fuel is outpacing supply. At times over the last 18 months the margin of spare capacity in the oil market has fallen from the historic norms. In addition, the storms and hurricanes of 2004 and 2005 impacted lives and properties in a way we have never experienced before, severely disrupting petroleum and oil production and the nation's fuel supply systems. Production platforms in the Gulf of Mexico were shut down, pipelines were inoperable, and refining systems were off line for months – exposing our vulnerability and reliance on natural gas.

By evaluating Florida's current and future energy supply and demand, the Department has developed a suite of recommendations, built on the principals of conservation and efficiency, which provide the foundation for a far-reaching energy plan. In developing its proposals, the Department adopted two guiding principles: reliance on markets and no new taxes. Instead of mandates, recommendations rely on the power of the marketplace, using targeted incentives and government's purchasing power to stimulate the free market. Consumers have already been impacted with rising fuel costs – government should not add to that burden.

The Department is recommending that legislation be introduced during the 2006 Regular Legislative Session to increase capacity and diversify Florida's electric generation and transportation fuel supply by:

- Amending the Power Plant Siting Act and the Florida Electrical Transmission Line Siting Act to reduce regulatory barriers and streamline permitting.
- Amending Chapter 403.519, Florida Statues, to allow the Florida Public Service Commission to consider fuel diversity and fuel reliability as factors when determining the need for new electric generation.

- Increasing grant funding for research and demonstration projects associated with renewable energy systems and alternative fuel vehicles.
- Providing consumer and corporate rebates to encourage investments in solar technologies and ENERGY STAR™ appliances.
- Providing sales and corporate income tax incentives to encourage the production of clean fuels in Florida and for pollution-free hydrogen fuel cells, vehicles and fueling infrastructure.
- Establishing an energy council to provide policy advice and counsel to the Governor, Speaker of the House and President of the Senate.

Administratively, the Department will immediately begin working with other state agencies and entities to improve energy diversity, sustainability, efficiency and conservation statewide by:

- Adopting updated interconnection standards to include all distributed generation technologies, such as wind, solar and biomass.
- Requiring all new State government buildings to meet U.S. Green Building Council's Leadership in Environmental Design standards.
- Expediting State performance contracting with Energy Service Companies.
- Promoting awareness of energy conservation, alternative energy technologies and alternative fuel vehicles.
- Facilitating redundant and diverse petroleum supply and distribution mechanisms into and within Florida.
- Encouraging fueling stations to adopt a generator sharing program before the upcoming hurricane season as a cooperative method for allocating generators and reestablishing temporary power service after storm events.
- Fostering a state-level partnership with local planning boards to encourage well-designed transportation and transit systems within new community development.

An adequate, reliable, diverse, efficient and affordable energy supply, coupled with a long-term commitment to energy conservation, is vital for maintaining Florida's growing economy and quality of life. Florida must act now to respond to growing demand and to overcome the vulnerabilities highlighted by the hurricanes. We look forward to finalizing a comprehensive energy plan that will provide long-term energy security for the State of Florida.

Sincerely,

Colleen M Castille
Secretary
Florida Department of Environmental Protection

STATE OF FLORIDA

OFFICE OF THE GOVERNOR

EXECUTIVE ORDER NUMBER 05-241

WHEREAS, according to a 2001 study by the United States Energy Information Administration, Florida ranks third in total energy consumption; and

WHEREAS, Florida's need for electrical generation is expected to grow by approximately 58 percent between 2002 and 2020; and

WHEREAS, Florida uses 8.6 billion gallons of gasoline per year, and consumption is growing by 300 million gallons per year; and

WHEREAS, less than one percent of Floridians own automobiles that use alternative fuels; and

WHEREAS, Florida has one of the nation's fastest growing populations with an average of 980 new residents arriving per day and approximately 80 million visitors arriving per year, thereby increasing the demand on Florida's energy supply; and

WHEREAS, current trends indicate Florida's dependence on natural gas to generate electricity will continue to increase; and

WHEREAS, Florida annually produces less than one percent of crude oil production and depends almost exclusively on other states and countries for supplies of oil; and

WHEREAS, catastrophic hurricane seasons in 2004 and 2005 have underscored Florida's vulnerability to disruptions in energy supply and the resulting impacts to Florida's economy, environment, and quality of life; and

WHEREAS, a long-term commitment to energy conservation in conjunction with an adequate, reliable, diverse, efficient, and affordable energy supply is vital to Florida's population growth, economic expansion and security; and

WHEREAS, the Governor's Office and the Governor's executive agencies are leading Florida's conservation efforts by adopting multi-phased, event based, cost-effective, efficient practices, which include, but are not limited to, replacing some traditional motor vehicles with hybrid vehicles, eliminating the use of non-essential equipment and appliances, turning off all lights, computers, and office equipment while not in use, and adjusting thermostats in state buildings;

NOW, THEREFORE, I, JEB BUSH, Governor of Florida, by virtue of the authority vested in me by the constitution and laws of the State of Florida, do hereby promulgate the following executive order:

Section 1. Energy Conservation.

The Governor's Office and the Governor's executive agencies are hereby directed to continue their energy conservation efforts to reduce the demand for energy in Florida and are further encouraged to develop innovative conservation initiatives to serve as a model for all Floridians. In addition, all other departments and agencies of state government, as well as all local governments, are hereby encouraged to develop and implement long-term conservation initiatives. For example, state and local governments should invest in energy efficient equipment and hybrid electric or alternative fuel vehicles.

Section 2. Energy Supply.

The State of Florida, through the Secretary of the Department of Environmental Protection shall develop a comprehensive energy plan by evaluating Florida's current and future energy supply and demand. This evaluation shall include an analysis of the following sectors: utility providers; petroleum companies; automobile manufacturers; fuel suppliers; technology companies; environmental organizations; researchers; the United States Department of Energy; members of the Florida Public Service Commission; members of the Florida Energy 2020 Study Commission; and consumers.

To assist with developing the State's energy plan, the Secretary of the Department of Environmental Protection shall host the 2005 Florida Energy Forum before December 31, 2005, in Tallahassee, Florida and serve as chairperson for the Forum. Forum participants shall address the diversification of Florida's energy supplies, energy generation, transmission, distribution, conservation and energy security, as well as discuss the barriers presented by government and potential incentives that may be offered to help Florida's future energy needs.

The State's energy plan shall consider all relevant topics, including, but not limited to the following:

A. Florida's current and projected energy needs.

B. A review of Florida's efforts to meet its current energy needs, including, but not limited to, laws, regulations, executive orders, Florida's Building Code, alternative energy investments through the Office of Tourism Trade and Economic Development, Florida's Energy 2020 Study Commission, Florida's Energy Future: Opportunities for Our Economy, Environment and Security Report, and conservation plans implemented by the state.

C. Florida's ability to generate, transmit and distribute electric power.

1. Florida's current and projected electric generating capacity for natural gas, liquefied natural gas, oil, coal, nuclear power, alternative and renewable energy sources (hydrogen, solar, biomass, wind and landfill methane), and other emerging energy technologies.

2. Florida's current and projected infrastructure needs for the production and supply of natural gas, liquefied natural gas, oil, coal, nuclear power, alternative and renewable energy sources (hydrogen, solar, biomass, wind and landfill methane), and other emerging energy technologies.

3. Florida's current and projected consumer costs of natural gas, liquefied natural gas, coal, nuclear power, alternative and renewable energy sources (hydrogen, solar, biomass, wind and landfill methane), and other emerging energy technologies.

4. Current regulatory oversight, both state and federal, of natural gas, liquefied natural gas, coal, nuclear power, alternative and renewable energy sources (hydrogen, solar, biomass, wind and

landfill methane), and other emerging energy technologies.

5. A review of Florida's successes in achieving energy efficiency.

6. Goals, both public and private, for the diversification of Florida's electric power supply.

D. Florida's ability to generate, store and distribute fuel.

1. Florida's current and projected capacity for gasoline, diesel fuel, ethanol, biodiesel, hydrogen and natural gas.

2. Florida's current and projected infrastructure needs for the production and supply of gasoline, diesel fuel, ethanol, biodiesel, hydrogen and natural gas.

3. Florida's current and projected consumer costs of gasoline, diesel fuel, ethanol, biodiesel, hydrogen and natural gas.

4. Current regulatory oversight, both state and federal, of gasoline, diesel fuel, ethanol, biodiesel, hydrogen and natural gas.

5. A review of Florida's successes in achieving energy efficiency.

6. Goals, both public and private, for the diversification of Florida's fuel supply.

E. Traditional and alternative fuel vehicles, consumer access to alternative fuels, the current and projected costs to consumers for traditional and alternative fuels, and the current and projected infrastructure needs for the production and supply of alternative fuel vehicles and the relative costs and benefits of any said alternatives.

F. Methods by which Florida can protect its energy supplies during an emergency.

G. Methods by which the State can reduce barriers and provide incentives to increase energy efficiency in power and fuel consumption.

At the conclusion of the 2005 Florida Energy Forum, the Governor's Office and the Department of Environmental Protection will issue an updated energy strategy by no later than January 17, 2006.

H. All agencies under the control of the Governor are directed, and all other agencies are requested, to render assistance and cooperation to the 2005 Florida Energy Forum.

J. The Department of Environmental Protection shall provide all funds and administrative support necessary to implement the provisions of this Executive Order.

IN TESTIMONY WHEREOF, I have hereunto set my hand and have caused the Great Seal of the State of Florida to be affixed at Tallahassee, The Capitol, this 10th day of November, 2005.

Jeb Bush

I. Executive Summary

Florida's economy and quality of life depends on a secure, adequate and reliable supply of energy. As the fourth most populous state, Florida ranks third nationally in total energy consumption.

With more than 17 million citizens and nearly 1,000 new residents arriving daily, Florida is one of the fastest growing states in the nation. Because of its expanding economy, current forecasts indicate that Florida's electricity consumption will increase by close to 30 percent over the next ten years. But electricity demand presents just one challenge. Next to buildings, transportation is Florida's second largest energy use sector. The demand for motor vehicle transportation fuel currently tops 28 million gallons per day and is expected to increase to more than 32.3 million gallons per day during the next decade, assuming a 15 percent population increase.

Since the last review of Florida's energy policy in 2000, several unpredictable events have heightened concern over energy reliability, security and supply. The 2003 blackout in the northeast, along with tremendous back-to-back hurricane seasons in 2004 and 2005, demonstrated the impact power outages and fuel interruptions have on the nation's economic welfare.

Producing less than one percent of the energy it consumes and limited by its geography, Florida is more susceptible to interruptions in energy supply than any other state. Unlike other states that rely on petroleum pipelines for fuel delivery, more than 98 percent of Florida's transportation fuel arrives by sea. The state's reliance on imported petroleum products, in addition to its anticipated growth in consumption, underscores its vulnerability to fluctuations in the market and interruptions in fuel production, supply and delivery.

The need to pursue a comprehensive energy plan for Florida cannot be understated. Energy demand is increasing at a significant rate. In turn, such increases have the potential to contribute to a continued limited market and sustained higher oil and natural gas prices.

Energy Production and a Growing Economy

Florida depends almost exclusively on other states and nations for supplies of oil and gasoline, generating less than one percent of the nation's crude oil production annually.

To generate electricity, Florida primarily relies on natural gas, coal and oil imports.

Together, fossil fuels represent 86 percent of Florida's total generating capacity. Less than 10 percent of its generating capacity is derived from cleaner nuclear and renewable fuels. In fact, no new nuclear plants have entered service in Florida since 1983.

Current forecasts indicate that new generation capacity will be 80 percent natural gas-fired and 19 percent coal-fired. Meeting these projections could prove expensive at today's prices and lead to an over-reliance on one fuel type, affecting the reliability of electric utility generation supply in Florida. While expansions for natural gas capacity are needed and already underway, improving generation fuel diversity would enhance reliability over the long-term. Too great a reliance on a single fuel source leaves Floridians subject to the risks of price volatility and supply interruption.

A New Class of Energy

Although the nation's reliance on traditional fossil fuels is currently high, Florida is investing in alternative fuels and developing "next generation" energy technologies. In 2003, Governor Jeb Bush launched "H2 Florida" to accelerate the commercialization of hydrogen technologies and spur economic investment in Florida's economy. With a four to one return on investment, Florida and its federal partners have invested $9 million to date in hydrogen infrastructure. Construction of a "hydrogen highway" is underway, 28 hydrogen demonstration projects are in progress and more than 100 hydrogen research and development projects are taking place at Florida's universities.

Utilization of biofuels is in its infancy with the cost of renewable fuels relatively high compared with traditional hydrocarbon fuels. Currently, Florida has just one biodiesel facility and, absent a manufacturing plant, imports ethanol from refineries outside of the state. Increasing production, supply and infrastructure of biofuels through financial incentives would provide both economic and environmental returns for the state. Likewise, a stronger investment both residentially and commercially in solar technology would not only reduce utility costs but generate pollution-free power for Floridians. To date, solar technology has remained largely inefficient and expensive, however, costs are gradually decreasing as system quality and reliability increases. To encourage continued investment in solar energy, systems received a permanent exemption from Florida sales and use tax in 2005.

Storm Impacts and Hurricane Recovery

The unprecedented level of storm activity during the 2004 and 2005 hurricane seasons spotlighted Florida's vulnerability to energy supply disruptions both in terms of power generation and transportation fuel supply. The impacts of the 2005 summer storms were particularly widespread. During the peak of the hurricane season, Panhandle ports remained closed to ocean traffic for several days, leaving residents and businesses without fuel. As Hurricane Rita followed Hurricane Katrina through the Gulf of Mexico, the Florida Reliability Coordinating Council declared a generating Capacity Advisory, appealing for conservation to prevent potential brownouts. Across the nation, production shortages led to a jump in natural gas prices and an increase in oil prices; gasoline prices rose to more than $3 per gallon and winter heating expenses were expected to increase by up to 35 percent over the previous year.

The Gulf of Mexico is of critical importance to the nation, supplying 29 percent of the nation's domestic oil production and 19 percent of the domestic gas production. When Hurricane Katrina hit on August 30, 2005, 95 percent of daily oil production and 88 percent of daily gas production was shut down. The storm left offshore production facilities, coastal refineries, pipelines and other energy infrastructure severely damaged. By January 2006, nearly five months after the storm, more than a quarter of the oil production and 19 percent of natural gas production from federal leases in the Gulf

of Mexico remained shut down. Approximately 100 oil and gas platforms in federal waters remain out of service today. The United States Mineral Management Service estimates that cumulative production losses from Hurricanes Katrina and Rita so far amount to 547 million barrels of oil, equivalent to more than 20 percent of yearly oil production in the Gulf of Mexico. Full recovery of oil and natural gas production along the Gulf Coast is not expected until the summer of 2006, keeping pressure on energy prices.

A Vision for Florida's Future

Florida's energy policy was last reviewed by the Florida Energy 2020 Study Commission in 2000. The Commission addressed extended forecasts of energy supply and demand, reliability of the electric and natural gas supply within the state, emerging electric generation technologies, the potential impact of electrical restructuring and deregulation, and the environmental impact of electricity supply production, generation, and transmission in the state. Since then, considerable advances have been made in "next generation" energy technologies. In addition, Florida's experiences during the past two hurricane seasons have highlighted the critical need to reduce the state's susceptibility to energy disruptions.

To begin laying the foundation for Florida's energy future, Governor Bush signed Executive Order #05-241 on November 10, 2005, directing State government, through the Secretary of the Department of Environmental Protection (DEP), to develop recommendations for a new comprehensive statewide energy plan. The Order also directed State executive agencies to continue their energy conservation efforts and encouraged the development of additional innovative conservation initiatives to serve as a model for all Floridians.

To assist with developing new energy policy, the Order directed the DEP to convene a public energy forum. On December 14, 2005, DEP Secretary Colleen Castille hosted the 2005 Florida Energy Forum in Tallahassee, inviting representatives from Florida's Public Service Commission, the U.S. Department of Energy, utilities, fuel companies, alternative and renewable energy experts, businesses, the Florida Legislature and the environmental community to provide input and guidance on achieving energy security.

Forum participants examined a breadth of issues included in the charge from the Order, addressing the diversification of Florida's energy supplies, energy generation, transmission, distribution, conservation and efficiency, along with existing regulatory barriers and potential incentives for achieving energy security.

As a result, this report contains recommendations for achieving a diverse and reliable energy future that is built on the underlying principles of conservation and efficiency:

- The state's energy should be derived from a wide mix of available fuel sources and technologies, incorporating home-grown energy from renewable resources and alternative fuels and avoiding reliance on any one fuel type.
- The state's energy supply should be reliable, with redundancy in fuel delivery mechanisms and expanded capacity.
- Government, businesses and consumers should maximize the use of energy consumed,

employing sustainable practices, eliminating waste and adopting conservation measures.

- Government, businesses and consumers should utilize energy efficient products and practices that use less energy, conserve resources and reduce utility costs.
- Florida should support its energy strategy by leveraging the incentives provided in the 2005 Federal Energy Policy Act

To prevent duplication where other official entities are acting, this report touches briefly on improving electric infrastructure. Following damage to electric transmission service lines and subsequent extended power outages during the 2005 hurricane season, the Public Service Commission is hosting an Electric Infrastructure workshop with electric utilities, cooperatives and local governments on January 23, 2006 to focus on actions needed for minimizing future infrastructure damage.

The recommendations outlined in this report describe administrative actions for immediate implementation, proposals for legislative action during the 2006 Regular Legislative Session and policy improvements that will enhance electric power generation and transportation fuel supply to help provide energy stability over the long-term.

Recommendations for Electricity Generation

- Streamline and expedite the siting and permitting of generation resources by revising the provisions of the Florida Electrical Power Plant Siting Act.
- Streamline and expedite the siting and permitting of electric transmission and distribution resources by revising the provisions of the Florida Electrical Transmission Line Siting Act. Incorporate the siting of substations into the Transmission Line Siting Act.
- Promote fuel diversity, fuel supply reliability and energy security.
- Facilitate additional fuel delivery mechanisms in Florida for power generation. Expedite all State permits required for the redundancies and increased capacity.
- Adopt updated interconnection standards to include all distributed generation technologies.
- Establish an energy council to provide policy advice and counsel to the Governor, Speaker of the House and Senate President.
- Expedite State performance contracting with Energy Service Companies.
- Promote awareness of energy conservation and alternative energy technologies.
- Use discretionary enforcement authority to allow approved alternative energy projects that provide a greater public benefit in lieu of civil monetary penalties.
- Require all new State government building construction to meet the U.S. Green Building Council's Leadership in Environmental Design standards. Encourage local governments and community developers to adopt high performance green building practices.
- Provide grant funding for research and demonstration projects associated with the development and implementation of renewable energy systems. Expand solar, hydrogen, biomass, wind, ocean current and other emerging technologies.
- Identify alternative energy production and distribution industries as Qualified Target Industries.
- Provide consumer and commercial rebates to assist with initial cost of photovoltaic and solar thermal technology installations on residential and commercial buildings.
- Provide consumer rebates for purchases of energy efficient ENERGY STAR™ appliances.
- Provide sales and corporate tax incentives for the manufacture, purchase and use of fuel cells for supplemental and backup power.

Recommendations for Transportation Fuels

- Facilitate additional and diverse petroleum supply and distribution mechanisms into and within Florida. Expedite all State permits required for the redundancies and increased capacity.
- Encourage fueling stations to cooperatively adopt a system modeled after the Florida WARN System to facilitate the relocation and use of generators to reestablish service.
- Foster state-local partnerships to encourage well-designed transportation and transit systems between established communities and within new community development.
- Raise public awareness for alternative fuel vehicles through public programs. Encourage public entities, including school districts and local governments, to use biofuels in fleets.
- Provide grant funding for applied research and demonstration projects associated with the development and implementation of alternative fuel vehicles and other emerging technologies.
- Provide sales and corporate income tax credits for hydrogen vehicles and fueling infrastructure.
- Provide corporate sales and income tax incentives to improve production, develop distribution infrastructure and increase availability of clean fuels, including biodiesel and ethanol.

II. Florida's Ability to Generate, Transmit and Distribute Electric Power

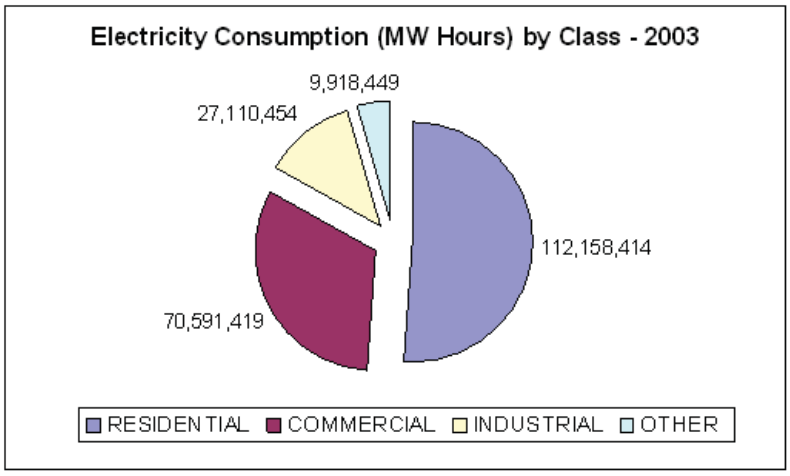
A. Current and Projected Electric Generating Supply and Demand

According to a 2001 study by the United States Energy Information Administration, Florida ranks third nationally in total energy consumption. Florida's demand for electric generation is expected to grow by approximately 58 percent between 2002 and 2020.

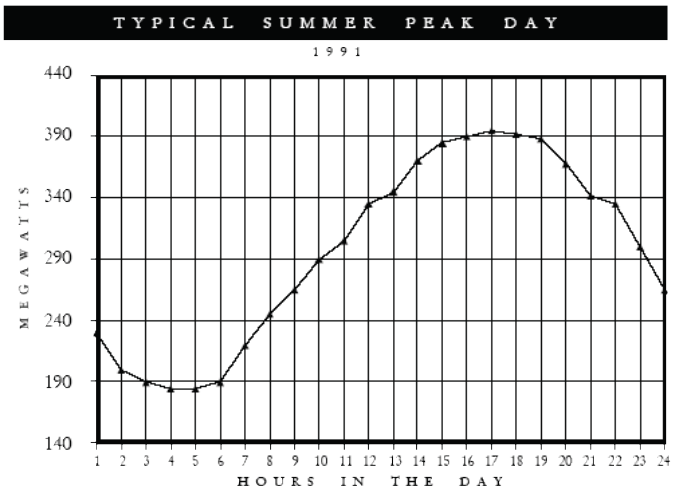
Florida currently has 57 electric utilities, consisting of five investor-owned (IOU), 18 cooperatively owned, and 34 municipally owned utilities. The largest investor owned utilities include Florida Power & Light Company (FPL), Progress Energy Florida, Tampa Electric Company (TECO), and Gulf Power Company (Gulf). The largest cooperatively owned utility is Seminole Electric Cooperative, and the largest municipally owned utilities are Jacksonville Electric Authority, Orlando Utilities Commission, City of Tallahassee, City of Lakeland, and Gainesville Regional Utilities.

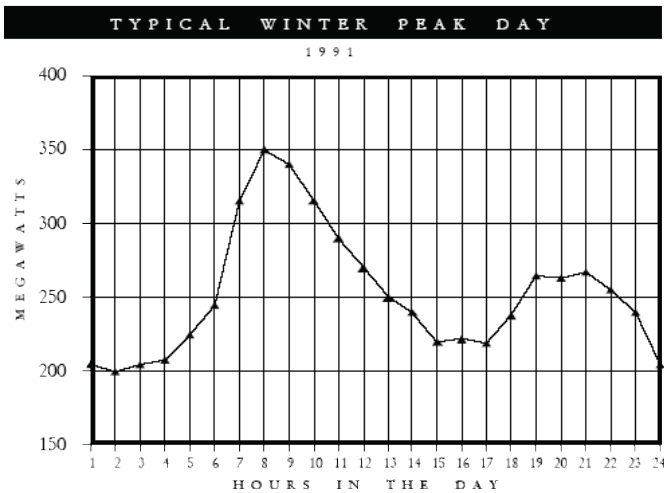
Based on 2003 data, 51 percent of all electric energy was consumed by residential customers, 32 percent by commercial customers, and 12 percent by industrial customers, with approximately two percent being used for other purposes. The following graphic displays the actual megawatt hours consumed by each customer class in 2003.

As illustrated above, the load profile of Florida is heavily influenced by the residential customer class. Due to high residential consumption, Florida must have adequate energy generation capacity to satisfy the changing needs of consumers throughout the day.



A representation of the typical summer and winter peak load profiles is shown below. [1]





It is Florida's fast growing population combined with the unique operational constraints of satisfying these peak summer and winter load profiles which dictates the need for continued growth in electric generation capacity.

Currently, Florida's electric utilities have 51,377 megawatts[2] (winter ratings[3]) of installed capacity[4] to meet the needs of customers. To meet Florida's growing demand for electricity, an acceleration of power plant construction is occurring. Over the next ten years, Florida's electric utility industry is constructing or planning to add approximately 19,390 megawatts (winter ratings) of new generating capacity. Future electric needs will also continue to be supplemented by utility demand-side management, energy efficiency programs and electricity production from renewable resources. Electricity consumption statewide, currently at 241,514 gigawatt-hours[5], is also expected to significantly increase during the ten-year planning horizon. Current forecasts indicate that electricity consumption will increase more than 67,276 gigawatt-hours (27.9 percent) over the next ten years.

To meet the changing load on Florida's electric systems, utilities must construct and operate various types of units. Baseload generation, primarily made up of large coal-fired and nuclear units, meets the load that is continuously on the system. These units have high capital costs but lower fuel costs associated with their operation. As the load rises during the day, intermediate units, primarily oil and natural gas-fired, are brought on line and then ramped down as the load decreases at night. These units may run for between 50 and 70 percent of the day and generally have lower capital costs to construct, but higher fuel costs. To meet peak demand combustion turbine units, primarily oil and natural gas-fired, are cycled on for shorter periods. These units may only run between five and 20 percent of the day depending upon weather conditions. Combustion turbine units generally

1 Florida Energy 2020 Study Commission Report, 2001

2 A megawatt (MW = 1,000 kilowatts) is a measure of real power at any instant in time, that is, a measure of demand on the grid at any moment in time. A typical home might have a demand that ranges from 1 to 10 kilowatts or more depending on what electrical appliances were being used.

3 Electric generating facilities have different megawatt ratings for the summer and winter seasons as cooler temperatures typically allow for higher output.

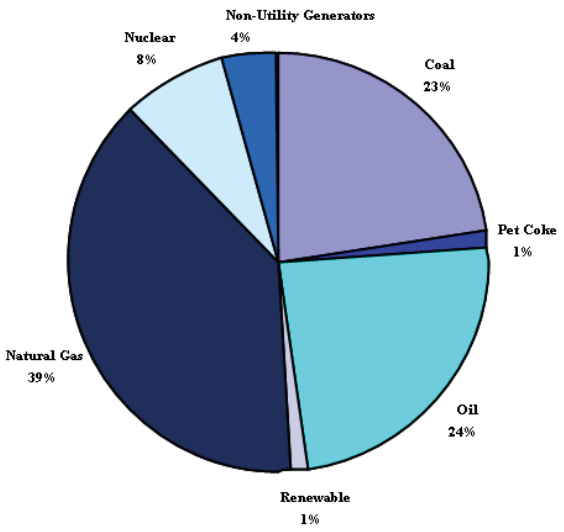
4 Includes existing generation and purchases from outside the state.

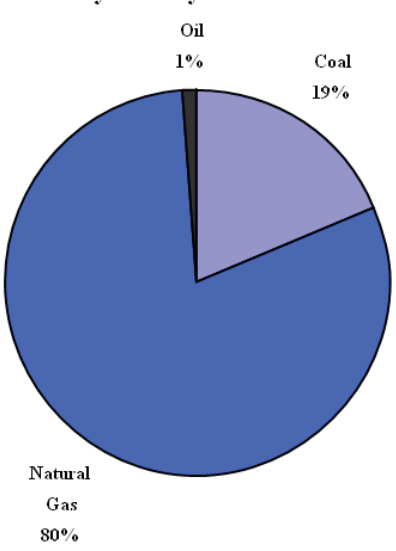
5 A gigawatt-hour ((GWH) = 1000 megawatt hours (MWH), and a MWH = 1000 kilowatt hours (KWH)) is a measure of the kilowatt demand aggregated over some time interval and represents the amount of electric energy consumed. A typical Florida residential customer will consume about 1,150 KWH per month.

have the lowest capital costs but the highest fuel costs due to lower efficiencies in converting fuel to electricity.

Electric utilities regularly conduct short and long-term planning exercises to ensure sufficient resources are in place to meet increasing demand. These studies determine the type of generation that is needed on the system. Baseload generation would generally take seven to ten years to receive regulatory approval and construction. Intermediate units, specifically combined cycle units, require approximately five years for approval and construction. Therefore, the ability of a utility in the short term to modify its overall fuel requirements is severely limited due to the time required to bring new generation online.

Presently, Florida's electric generating capacity is based on a variety of fuels: natural gas represents 39 percent of installed capacity, coal represents 23 percent, and oil represents 24 percent. Cumulatively, these petroleum based fuels represent approximately 86 percent of Florida's total generating capacity. Additionally, Florida's installed generating capacity includes nuclear generation (eight percent), Non Utility Generators (four percent), and renewables (one percent). In the future, new generation capacity additions are forecasted to be primarily 80 percent natural gas-fired and 19 percent coal-fired.





The charts above show the current installed generating capacity by primary fuel source and the projected new generation capacity additions for 2005-2014. One area of concern, which these charts highlight, is the projected growth of natural gas as the primary fuel source. While these projected new generating capacity additions are typically selected for construction based on the most cost-effective combination of capital and operating (fuel) costs, maintaining generation fuel diversity is quickly becoming a concern as well.

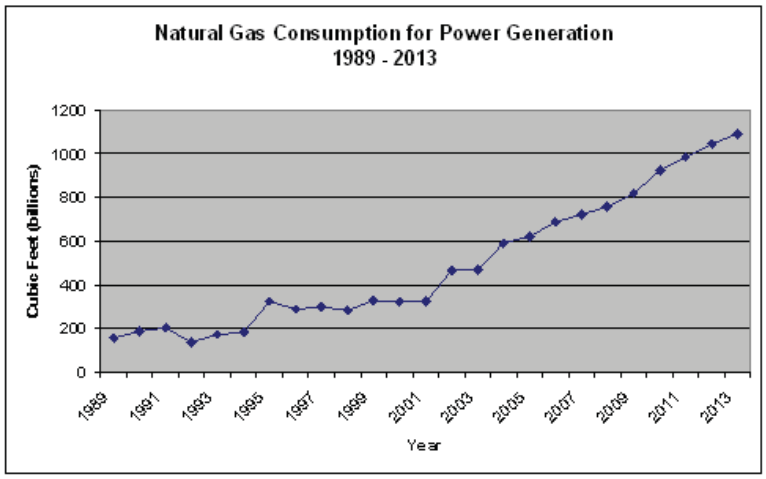
The following section specifically examines the expected trends in installed capacity and total fuel consumption for each major source of electrical power generation: natural gas, oil, coal, nuclear, interchange purchases, purchases from Non-Utility Generators (NUGs), and renewable energy sources.

Natural Gas

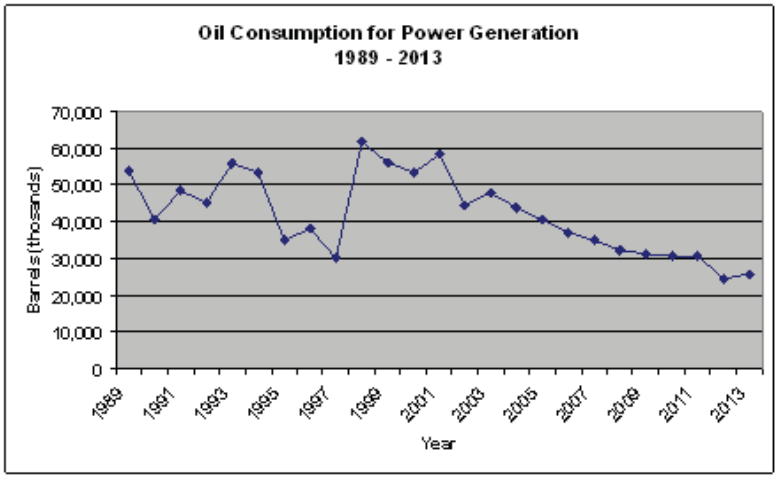
Florida's utilities continue to project a substantial increase in natural gas-fired generation. Natural gas-fired generation, currently at 29.9 percent of total statewide energy consumption, is expected to increase to 44.4 percent over the next ten years. Of the approximately 19,100 megawatts in gross capacity additions[6] projected in the state over the 2014 planning horizon, nearly 15,300 megawatts is anticipated to come from gas-fired capacity in the form of new combined cycle and combustion turbine (CT) units. Natural gas consumption forecasts do not include usage from proposed new Independent Power Producer (IPP) generating units.

Oil

Florida ranks first among all states in the amount of electricity it produces from oil. Forecasts indicate that oil-fired energy will decrease from 12.2 percent to 7.0 percent of total statewide energy



production over the next ten years. Oil-fired generation decreased substantially during the 1980s in response to rising oil prices in the 1970s. Many utilities, however, still use oil in peaking combustion turbine units as a primary and secondary fuel. Due to escalating natural gas prices, utilities have recently burned oil more frequently in baseload and intermediate combined cycle units for economic



6 Gross additions exclude capacity decreases due to unit derating, retirement, or terminating contracts.

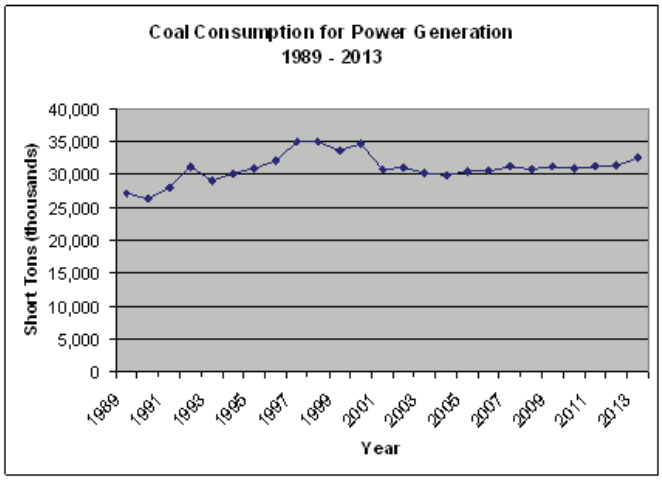
reasons. In addition, recent experience with Hurricanes Katrina and Rita illustrate the need for electric utilities to have oil available as a backup fuel when interruptions to natural gas supplies occur.

Coal

Coal generation increased substantially during the 1980s in response to the oil price increases of the 1970s. Coal plants have traditionally been operated based on low forecasts of coal prices relative to oil or natural gas. However, coal plants are capital-intensive. Stricter environmental regulations may lead to increased capital investments at coal plants. In 2004, the state's utilities forecasted increases in coal-fired capacity of approximately 1,100 megawatts from the previous year's forecast of new coal capacity to be added. The 2005 forecast shows an expected 3,786 megawatts of new coal capacity over the next ten years.

Nuclear

Nuclear generation increased considerably during the 1970s and early 1980s. Nuclear plants were



built based on low fuel price forecasts relative to oil or natural gas. However, nuclear plants are capital-intensive, take as much as ten years to certify and build and present concerns surrounding the storage and disposal of spent fuel rods. No new nuclear plants have entered service in Florida since 1983. While no utility's Ten-Year Site Plan contains proposed nuclear units, Progress Energy Florida recently announced its intention to pursue a new nuclear generating unit in Florida within the next ten years. Any nuclear additions would be operational past the 2014 planning horizon.

Interchange Purchases

Florida's utilities continue to rely on capacity and energy purchases from out-of-state utilities. Interchange purchases are typically short-term purchases of excess capacity and energy between utilities. Florida can safely import around 3,600 megawatts over the Southern Company-Florida interconnection. Approximately 2,500 megawatts of the interface is currently reserved for firm sales and for delivery of capacity from generating units owned by Florida utilities located in Southern Company's region. Approximately 1,100 megawatts remains available for non-firm, economy transactions.

Purchases from Non-Utility Generators

Non-utility generators (NUGs) build and operate power plants to satisfy contractual requirements with retail-serving electric utilities. NUGs sell firm capacity to many of Florida's utilities under long-term and short-term purchased power contracts. Forecasts indicate that the amount of NUG electricity purchased by Florida's utilities will decrease from three percent to 1.5 percent of statewide energy consumption during the planning horizon. The forecasted decrease is due to the expiration of 377 megawatts of firm purchase contracts with qualifying facilities and 339 megawatts of firm purchase contracts with renewable sources. However, once the current contracts expire, these generators will remain in place in Florida and should remain available to provide capacity and energy under new purchased power contracts with utilities.

Renewables

The renewable resources presently in the state are derived from a small amount of hydroelectric, landfill gas, biomass and waste-to-energy sources. Electric utilities and NUGs produce renewable energy in Florida. Non-utility producers of renewable energy use some of their output onsite, selling the remainder to electric utilities either under firm contracts or on an as-available basis.

Hydroelectric units at two sites in northwest Florida, one utility-owned and one operated by the Federal government, supply approximately 50 megawatts of renewable capacity. Hydroelectric generation accounts for less than 0.1 percent of Florida's generation mix. There are no planned new units due to the absence of a feasible location, as Florida's flat terrain does not lend itself to hydroelectric power.

Landfill gas provides a combined 2.5 megawatts of capacity to Gainesville Regional Utility (GRU) and Jacksonville Electric Authority (JEA). When factoring in direct use and co-generation applications, landfill gas provides nearly 40 megawatts of power statewide. Further development of landfill gas energy resources could result in an additional 68 megawatts.[7]

Florida's utilities purchase 506 megawatts of non-utility generator capacity fired by municipal solid waste, wood and wood waste, and waste heat. The scheduled expiration of contracts during the planning horizon will reduce the amount of firm renewable capacity to 167 megawatts by 2014, a decrease of 339 megawatts.

Wind turbine efficiencies have increased and costs have dropped due to research and development advances and manufacturing improvements. A recent study funded by the U.S. Department of Energy's Wind Powering America program concluded that Florida's onshore wind resources traditionally considered "marginal to good" could now be "fair to excellent." In addition, utility scale wind power generation appears to be economically viable at certain offshore and at direct coastal sites within view of the Atlantic Ocean and Gulf of Mexico.

The study further suggests that large utility-scale wind power generation is unlikely to be economically viable at inland sites more than a few hundred yards from the coastline anywhere within Florida today, with the possible exception of outer Cape Canaveral, the Panama City Beach region and the lower Florida Keys. However, there are several locations where small, distributed wind power appears feasible. Steep hills that reach 100 to 300 feet above the surrounding terrain

7 USEPA Landfill Methane Outreach Program

near electric loads and distribution lines were identified in the highlands northwest of Orlando and northeast of Tampa. In addition, coastal sites in view of open Ocean or Gulf waters have good wind resources. Mounting small wind turbines on existing cell phone towers could avoid the cost of tower construction – about half the cost of a small-wind project. To improve the economics of Florida wind energy, turbine blade design can be engineered and optimized to better match Florida's low-speed wind resources.[8]

Solar technology has been in use for years with a gradual decrease in cost and an increase in system quality and reliability. Most are building owner purchased systems and the majority of those are solar thermal (water heating) systems. Solar swimming pool heaters are the leading solar product installed in Florida.

Additionally, utility-based solar programs exist. The City of Lakeland Electric and Water Department has a solar thermal program where the utility installs and owns the solar water heater and sells the produced hot water to the customer. This program recently passed a rate impact measures test (RIM test) conducted by a consulting firm hired by the utility to evaluate conservation and demand-side management measures.

Under both state and federal law, any generator who uses renewable resources is allowed to sell any or all of its electric output to a utility for "full avoided cost." Full avoided cost is defined as the cost of the next increment of power that the utility would have incurred if it had produced the power. Thus, as electric production cost increases, renewable generators have an economic incentive to sell to the grid.

8 "Florida Wind Initiative", USDOE Wind Powering America, 2005.

Proposed New Generation Capacity[9]

Company	Plant	MY Capacity Planned	Fuel Type	Type of Plant or Units Proposed	Est. On-line Date
Hillsborough Co	Hills Co. Resource Recovery Facility	17	Garbage	Resource Recovery Facility	N/A
Florida Power & Light	SW St. Lucie Coal – 2 Units	1700	Coal	Conventional	2012, 2014
Southern Co.	Demonstration Project at Stanton	285	Coal	Integrated Gasification Combined Cycle	2010
Seminole Electric	Unit 3 at Palatka	750	Coal	Pulverized/ Conventional	2012
JEA/FMPA	Coal Project	800	Coal	Conventional	2112
Gainesville Regional Util.	Deerhaven expansion	220	Coal	Cola Fluidized Bed/Biomass/ Other	2010
Progress Energy	Hines Unit 5	540	Gas	Combined Cycle	2009
Seminole Electric	Unknown – 2 Units	364	Gas	CC	2008, 2009
Pasco Co	Pasco Co. Resource Recovery Facility	20	Garbage	RRF	N/A
Palm Beach Co	Palm Beach Co Resource Recovery Facility	28	Garbage	RRF	2010
JEA	Circulating Fluidized Bed	250	Coal	CFB	2013
Progress Energy	Hines Unit 6	540	Gas	CC	2010
Progress Energy	Central Florida Nuclear	N/A	Nuclear	Nuclear	2015
Progress Energy	Unknown CC	536	Gas	CC	2012
Tampa Electric Co	Undetermined	502	Gas	CC	2013
Seminole Electric	Unknown – 3 Units	546	Gas	CC	2013, 2014
Progress Energy	Unknown CCs – 2 Units	1,072	Gas	CC	2013, 2014
JEA/Biomass Industries Group	Unknown – 2 Units	240	E-grass	Biomass	N/A

9 Projected electrical capacity under the Power Plant Siting Act

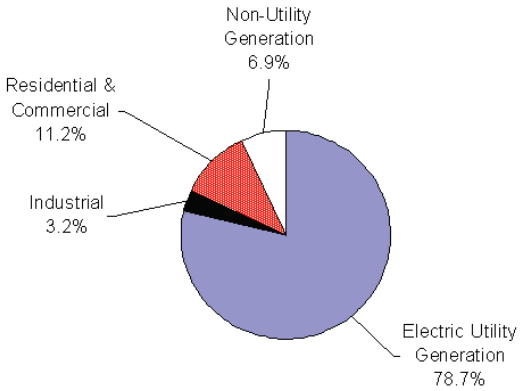
B. Current and Projected Infrastructure Needs for Production and Supply

Florida has limited native fuel resources. Energy sources native to Florida include solar, biomass and hydroelectric power in northwest Florida. All other fuels used by Florida's utilities are fossil (natural gas, oil and coal) or nuclear, which must be brought into the state by various transport systems. Coal is delivered by rail or barge, oil is delivered by tanker and nuclear fuel is delivered by rail and truck.

Natural Gas Pipeline Adequacy

Florida currently relies primarily on two major gas pipeline companies, Florida Gas Transmission (FGT) and Gulfstream Natural Gas (Gulfstream), to supply natural gas to electric utilities, industrial customers, local distribution companies and two smaller pipelines serving customers in the Panhandle (Southern Natural Gas and Gulf South). Florida Gas Transmission currently has a system pipeline capacity of 2.2 billion cubic feet per day (BCF/day), while Gulfstream has a system pipeline capacity of 1.1 BCF/day. More than 85 percent of the state's natural gas consumption is for electricity generation by utilities and non-utility generators.

Natural Gas Consumption by End-User – 2004



Forecasts indicate that electric utility generation will cause a 92 percent increase in natural gas requirements over the next ten years. Increased dependency on natural gas could affect the reliability of electric utility generation supply in Florida. The primary threat to reliability is the possibility of natural gas supply disruption. The Florida Reliability Coordinating Council (FRCC) has formed a Gas/Electricity Interdependency Task Force to determine reliability impacts and to recommend mitigating measures should reliability risks arise. The North American Electric Reliability Council (NERC) has established a Gas/Electricity Interdependency Task Force whose scope is almost identical to that of the FRCC task force. The NERC task force completed a study in May 2004, concluding in part that gas pipeline reliability can substantially affect electric generation, and that electric system reliability can have an impact on gas pipeline operations. The FRCC continues to review the recommendations made by the NERC task force to determine where to focus future analyses. The FRCC task force stated that the region has adequate pipeline capacity for reliability purposes for both current and future natural gas demand. However, the FRCC task force's conclusion assumes that the generating units that have the capability to burn oil will do so at times of peak demand. Therefore, economics may be the driving factor for any future expansion of gas pipelines.

Based on the forecasted requirements of electric utilities and other sectors, the Public Service Commission (PSC) estimates that total pipeline demand will require an average of 3.15 BCF/day by 2014. Given the current pipeline capacity of FGT and Gulfstream, sufficient capacity currently exists to serve forecasted 2014 requirements. The estimate could be understated because it relies on average daily demand rather than on maximum delivery levels specified in gas transportation contracts.

Because the 2014 forecasted pipeline capacity requirement might be underestimated based on average demand, the PSC also conducted a forecast based on the projected peak demand for gas capacity. Based on this methodology, it is estimated that by 2014, incremental pipeline capacity requirements could increase up to 1.34 BCF/day.

Florida Gas Transmission

FGT operates 5,000 miles of pipeline nationwide, 3,300 miles of which are in Florida. Six expansions have occurred since its inception in 1959, which have increased the pipeline's capacity from its original 0.278 BCF/day to its current 2.2 BCF/day. In October 2005, FGT filed an application with the Federal Energy Regulatory Commission (FERC) seeking authority to construct its Phase VII Expansion Project. This project involves the construction of 33 miles of 36-inch diameter pipeline looping and the installation of 9,800 horsepower of compression. The expansion will provide approximately 0.16 BCF/day of additional capacity to transport natural gas from a connection with Southern Natural Gas Company's proposed Cypress Pipeline project.

Gulfstream

Gulfstream placed Phase I of its two-phase natural gas transmission system into service in 2002. Phase I, with a capacity of 1.1 BCF/day, crosses the Gulf of Mexico between Pascagoula, Mississippi and Manatee County, Florida with more than 430 miles of 36-inch pipe. In February 2005, Phase II, a 110-mile extension to Florida's east coast, entered service to serve Florida Power and Light's gas-fired generating units at the Martin and Manatee plant sites.

Cypress

Southern Natural Gas has proposed expanding its existing interstate natural gas pipeline system between Port Wentworth, Georgia and an interconnection with FGT's system near Jacksonville, Florida. Project construction will occur in three phases. Phase I includes the initial pipeline of 165 miles of 24-inch diameter pipe. Phase II and III will consist of additional compression and looping. The source of natural gas will be Southern Natural Gas's Elba Island liquefied natural gas (LNG) facility near Savannah, Georgia. The Cypress pipeline will have the ability to flow gas between Florida and Georgia in both directions. In addition, the pipeline will provide Florida with a new, geographically diverse source of gas that will help mitigate supply disruptions caused by natural disasters such as hurricanes. In 2005, the PSC approved Progress Energy Florida's long-term contract to purchase gas supply on the Cypress pipeline. Phase I of the pipeline is expected to be in service in 2007, with Phase II and III becoming operational in 2009 and 2010, respectively.

Bahamas LNG Projects

Two consortia have proposed pipeline projects to transport LNG from the Bahamas to Florida. Two of the projects, the Tractabel Calypso Project and the AES Ocean Express Project, have received FERC approval, granting both projects a Presidential Permit to construct. The third project, the El Paso Seafarer Pipeline System, filed its certificate application with the FERC in November 2004, and the application is pending. These projects must first receive approval from the Bahamian government before construction can begin. The applicants have not yet contracted with an anchor utility customer to purchase the gas.

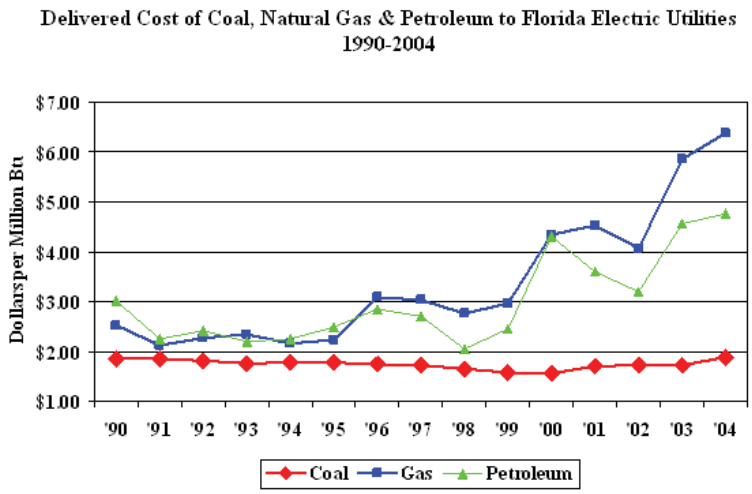
c. Current and Projected Consumer Costs

Electricity rates include base rates that include costs for electric generating capacity, transmission and distribution facilities, operation and maintenance expenses and administrative expenses such as billing. Rates are a function of the type of generating units on a utility's system, the costs to operate those units, including fuel, and the cost to transmit and distribute power to consumers.

Total Monthly Bill for 1,000 Kilowatt Hours – Residential Electric Service (For Florida Investor-Owned Utilities) Effective January 1, 2006

	Florida Power and Light Company	Progress Energy Florida, Inc.	Tampa Electric Company	Gulf Power Company
Base Rate	$38.12	$41.18	$51.92	$49.30
Fuel Cost Recovery	$58.41	$49.79	$54.35	$30.92
Energy Conservation Cost Recovery	$1.42	$0.76	$1.69	$0.88
Environmental Cost Recovery	$0.26	-$3.72	$0.62	$3.64
Capacity Cost Recovery	$6.03	$3.56	$9.93	$2.72
Storm Damage Cost Surcharge	$1.65	n/a	$3.61	$2.71
Gross Receipts Tax	$2.72	$2.74	$2.74	$2.31
Total Monthly Bill	$108.61	$109.56	$109.61	$92.48

Fuel costs incurred by the electric utilities to generate needed power are directly passed through to customers. The cost of fuel does not have any "markup" or generate earnings for the utilities.



The cost of renewable fuels remains relatively high compared with traditional hydrocarbon fuels, but advancements in renewable technologies have made some of these fuels more cost-competitive. The following chart compiled from several sources provides the estimated consumer cost per kilowatt hour of select renewable fuels.

Electric Power Consumer Costs ($/KWh)[10]	
Renewable Energy Source	Current Price
Hydrogen	0.26
Solar Thermal (for water heating)	0.054
Solar Photovoltaic (PV)	0.18 - 0.32
Biomass	0.08 - 0.12
Wind	0.04 - 0.06
Landfill Methane	0.02 - 0.06
Waste-to-Energy (WTE)	0.04 - 0.15

D. Current Regulatory Oversight of Electric Utilities

Florida Public Service Commission (PSC)

The PSC has authority to ensure the provision of adequate, reliable, reasonable cost electricity to consumers. The PSC has specific authority under Chapter 366, Florida Statues, to regulate the rates and service of investor-owned electric utilities in the state. It also has authority to oversee the reliability of the electric grid, to determine the need for new electric generating facilities (Section 403.519, F.S.), to establish utility conservation goals (Sections 366.80-.82, F.S.) and oversight of the safety of electric facilities (Section 366.04, F.S.).

The PSC has authority to set the rates of natural gas utilities that provide service to end-use customers. Proposed intrastate natural gas pipelines must receive an affirmative determination of need from the PSC prior to construction (Section 403.9422, F.S.) Inspection of natural gas facilities to help ensure safe operations is also conducted by the PSC.

10 Hydrogen figure derived from actual operating data reported to the Florida Energy Office. Solar figures provided by the Florida Solar Energy Center. Wind figure provided by National Renewable Energy Laboratory. Remaining figures derived from the 2003 report titled "An Assessment of Renewable Electric Generating Technologies for Florida".

Department of Environmental Protection (DEP)

Power Plants

The Power Plant Siting Act is a centralized, coordinated licensing process encompassing the permitting and other authorizations, including proprietary interests, of all state, regional, and local agencies in the jurisdiction of which an electric power plant is proposed to be located. The Act provides for a single certification (license) for those electric power plants, as defined by the Act, which are steam or solar powered, 75 megawatts or greater and are constructed after October 1, 1973. Only electric utilities as defined by the Act may apply for certification. The process includes mandatory land use and certification hearings by an administrative law judge, a Determination of Need by the PSC, with ultimate approval/denial authority vested in the Siting Board (Governor & Cabinet). The DEP coordinates the process.

Transmission Lines

The Transmission Line Siting Act is a centralized, coordinated licensing process encompassing permitting and other authorizations, including proprietary interests, of all state, regional, and local agencies in the jurisdiction of which a transmission line is proposed to be located. The Act provides for a single certification (license) for transmission lines. Transmission lines subject to the Act are those that are 230 kilovolts or greater, 15 miles or more in length and cross a county line. The process includes a mandatory hearing by an administrative law judge, a Determination of Need by the PSC, with ultimate approval/denial authority vested in the Siting Board (Governor & Cabinet). The DEP coordinates the process.

Natural Gas

The Natural Gas Pipeline Siting Act is a centralized, coordinated licensing process encompassing permitting and other authorizations, including proprietary interests, of all state, regional, and local agencies in the jurisdiction of which a natural gas pipeline is proposed to be located. Natural gas pipelines subject to the Act are those that are 15 miles or more in length and cross a county line. There are exemptions for pipelines that are designated for local distribution only and for pipelines that have received a certificate of public convenience and necessity from FERC. Most pipelines do receive a certificate of public convenience and necessity. As a result, no pipeline has been certified yet under the Act. The process includes a mandatory hearing by an administrative law judge, a Determination of Need by the PSC, with ultimate approval/denial authority vested in the Siting Board (Governor and Cabinet). The DEP coordinates the process.

Environmental Impacts

The DEP administers resource protection and pollution control permitting processes for all federal environmental permits that are delegated to or approved by the State. Federally delegated or approved permit programs include air permits such as Title V and Prevention of Significant Deterioration permits, water permits including National Pollutant Discharge Elimination System permits and Underground Injection Control. The DEP also administers state environmental permits for facilities that are not subject to the siting acts. The DEP also regulates any impacts to State owned lands.

Other State Regulatory Authorities

Power generation associated with some sources of renewable power is regulated through a variety of delegated authorities. The following section is intended to provide highlights of regulatory oversight but may not be all-inclusive:

Solar

Regulatory standards are tied to the type of buildings that consider solar technology, and there are few restrictions on how the technology is utilized or requirements for its use. All solar equipment sold in Florida must be certified by the Florida Solar Energy Center (FSEC) pursuant to Section 377.705, F.S. Certifications are issued by FSEC and the Solar Rating and Certification Corporation. Contractors are trained and tested by the FSEC and must obtain licensure through the Florida Department of Business and Professional Regulation pursuant to Section 489.105, F.S. As established by the PSC, interconnection of small photovoltaic systems (up to ten kilowatts) is allowed.[11] The interconnection requests are processed by the utility company, who will accept all requests meeting the standards of the application process. Building codes for installation of solar systems are regulated by the Department of Community Affairs.

Biomass

Biomass covers a broad array of fuel sources and different permitting may be applicable depending on the source utilized. Federal regulatory standards for biomass are administered by the United States Environmental Protection Agency through the authority of the Biomass Research and Development Act of 2000. In Florida, the DEP regulates biomass energy under the authority of the Clean Air Act.

Waste-to-Energy

Waste-to-energy is regulated by the DEP, which also permits waste-to-energy facilities.

Wind Energy

Florida Statues regarding the Renewable Energy Access Laws require that ordinances, deed restrictions, covenants or similar binding agreements cannot prohibit solar equipment use (and other renewable energy technologies). As such, regulatory oversight for wind energy is largely a local government issue.

e. Florida's Energy Efficiency and Alternative Energy Initiatives

Demand-side management (DSM) reduces customer peak demand and energy requirements, resulting in the deferral of need for new generating units. Utilities have offered DSM programs since 1980 under the requirements of the Florida Energy Efficiency and Conservation Act. The Act emphasizes reducing the growth rate of weather-sensitive peak demand, reducing and controlling the growth rate of electricity consumption and reducing the consumption of expensive resources such as petroleum fuels. To meet these objectives, the PSC sets numeric conservation goals and utilities develop and implement DSM programs to meet these goals.

Overall, Florida's utilities have been successful in meeting the overall objectives of the Act. Since 1980, utility conservation programs have reduced statewide summer peak demand by 4,951

11 Section 25-6.065, Florida Administrative Code

megawatts, winter peak demand by 5,511 megawatts and annual energy consumption by 5,488 gigawatt-hours. By 2014, DSM programs are forecasted to reduce summer peak demand by 5,563 megawatts, winter peak demand by 6,068 megawatts, and annual energy consumption by 6,883 gigawatt-hours.

State of Florida – Estimated Savings from Electric Utility DSM Programs[12]		
DSM Savings	**2005**	**By 2014**
Summer Peak Demand	4,951 MW	5,563 MW
Winter Peak Demand	5,511 MW	6,068 MW
Annual Energy Consumption	5,488 GWh	6,883 GWh

Numeric Conservation Goals and DSM Plans

The Florida Energy Efficiency and Conservation Act requires that all investor-owned utilities and any municipal or cooperative utility with annual energy sales of at least 2,000 gigawatt-hours as of July 1, 1993 meet numeric conservation goals set by the PSC. Seven Florida utilities are subject to this requirement: Progress Energy – Florida, Florida Power & Light, Gulf Power, TECO, Florida Public Utilities Company, JEA, and Orlando Utilities Commission.

The PSC set new numeric demand and energy goals for these seven utilities in July 2004. The new numeric goals were generally lower than the previous goals set by the PSC in 1999 for three primary reasons: (1) the Florida Building Code contains increased minimum energy efficiency levels, limiting the amount of incremental savings from utility sponsored programs; (2) many utility DSM programs have reached a saturation in participation levels; and (3) the relatively low cost of new generating units has reduced the cost-effectiveness of several DSM programs.

Energy Conservation Cost Recovery

Investor-owned utilities have the opportunity to recover prudently incurred expenditures associated with PSC-approved DSM programs through the Energy Conservation Cost Recovery Clause (ECCR). Since 1981, Florida's investor-owned utilities have collected approximately $4.15 billion through the ECCR, with nearly $2.54 billion recovered in the last ten years. Annual ECCR expenditures have stabilized at just under $250 million per year over the past six years for two primary reasons: 1) DSM programs have reached saturation in participation levels, and 2) DSM program cost-effectiveness continues to decline due to the lower cost of new generating units. However, as utility plans include more solid fuel generation options, DSM program cost-effectiveness will improve.

Federal and State Solar Energy Initiatives

To conserve energy and reduce electricity bills, the State is providing 150 solar water heaters to residents in 20 underserved communities throughout the state. Named *Front Porch Sunshine*, Florida is the first in the nation to install solar energy technology in weatherized, low-income homes.

Florida schools are using the state's free supply of sunshine to light classrooms and the imaginations of students. Florida's *SunSmart Schools Program* is installing 29 solar electric systems in schools

12 Demand savings are cumulative from 1980. Energy savings are on an annual basis.

throughout the state. The program combines State funding with private partnerships to provide clean energy and science education. The electric power generated by the system is used to power the school's classrooms, with excess energy returned to the local power grid. The system also provides an on site classroom for students to learn more about solar power and the benefits of energy conservation.

SunBuilt is the latest program to expand solar energy technology in communities throughout Florida. A partnership between DEP, the Florida Home Builders Association and the Florida Solar Energy Research and Education Foundation, *SunBuilt* provides rebate checks to home builders who install solar hot water heaters in newly constructed homes. *SunBuilt* Builders are eligible to receive rebates for each solar equipped home constructed. The reliable, low-maintenance solar systems use the sun's energy, instead of electricity, to heat water. A solar collector installed on the roof holds water that is heated by the sun. A traditional water heater serves as a backup supply of hot water on overcast or rainy days. Benefiting both the economy and the environment, the amount of energy generated annually by a single solar water heater is equal to two barrels of oil, lessening the state's dependence on petroleum imports.

Federal and State Energy Efficiency Initiatives

Florida's 35 million hotel guests can now opt to take a break at a *Green Lodge* – a new State designation that recognizes environmentally-friendly hotels and motels. The voluntary program establishes environmental guidelines for hotels and motels to conserve natural resources and prevent pollution. Hotels and motels reduce costs and earn designation by investing in simple and innovative 'green' practices that conserve water, save energy and reduce waste.

Rebuild America is a growing network of community-driven voluntary partnerships that foster energy efficiency and renewable energy in commercial, government and public-housing buildings. For example, the University of Central Florida is outfitting three buildings on campus with energy efficient technologies. The project will dramatically reduce energy consumption in these buildings, with energy savings reinvested in the project for wider application across campus. In addition, school districts in Florida, North Carolina and Tennessee were selected by the National Energy Foundation to receive energy education materials and teacher training. In school year 2003-04, four school districts with more than 19 million square feet of building space reported saving 18,346,495 kilowatt hours and nearly $1.2 million from energy conservation practices.

In 2004-05, the *Florida Energy Conservation Assistance Program* provided energy surveys of more than 9,717,000 square feet of building space for state/municipal governments, small businesses, agricultural and hospitality in Florida. The surveys identified more than $11.8 million of possible energy savings for the clients involved.

Federal and State Hydrogen Initiatives

In July 2003, Governor Jeb Bush launched "H2 Florida," a statewide initiative to accelerate the commercialization of hydrogen technologies, spur investment and economic opportunity and safeguard the nation's natural resources. H2 Florida partners the State of Florida with industry, governments and academia to showcase hydrogen technologies and stimulate a consumer market for cleaner, sustainable sources of energy. The State's commitment supports that of the White House's proposed investment of $1.7 billion over five years to develop hydrogen-powered fuel cells, hydrogen

infrastructure and advanced automotive technologies.

Florida has 28 hydrogen demonstration projects underway and seven state universities are conducting more than 100 hydrogen research and development projects. In 2003, the Florida Energy Office and Florida Power and Light installed a fuel cell at Hugh Taylor Birch State Park. Since that installation, the Florida Energy Office has installed fuel cells at North Port High School and Homosassa Springs State Park. Additionally, the DEP has purchased 12 fuel cells to provide backup power at their District and Branch Offices statewide.

III. Florida's Ability to Produce, Store and Distribute Transportation Fuel

A. Current and Projected Supply and Demand for Transportation Fuel

Transportation is Florida's second largest energy use sector comprising more than a third of the total energy used. Florida depends almost exclusively on other states and nations for supplies of oil and gasoline, producing less than one percent of the nation's crude oil production annually. Florida consumes 8.6 billion gallons of gasoline per year, and consumption is growing by 300 million gallons per year.[13]

Current transportation fuel needs are approximately 28.1 million gallons per day[14], not including aviation fuels. Motor gasoline and diesel fuel make up more than 87 percent of Florida's transportation energy costs, with aviation fuel accounting for less than 10 percent.[15]

In ten years, Florida's transportation fuel demand is expected to increase to 32.3 million gallons per day, assuming a 15 percent increase in the state's population.[16]

Refined Petroleum Products

Florida's reliance on imported petroleum products, in addition to its anticipated growth in consumption during the next decade, underscores a potential vulnerability to interruptions in fuel supply delivery during natural or man-made disasters.

Ethanol

The demand for ethanol is driven largely by the federal Energy Policy Act of 1992 (EPAct 1992), which required that public and private vehicle fleets operated within selected Metropolitan Statistical Areas (MSA) acquire and operate Alternative Fuel Vehicles (AFV). Florida contains nine designated MSAs in which the EPAct 1992 AFV standards apply. There are seven ethanol fueling stations in Florida, all of which are restricted for private fleet usage for EPAct 1992 compliance. The demand for ethanol-based fuels is expected to grow in coming years as at least one major automobile manufacturer (Ford Motor Company) has announced plans to increase production of AFVs by 2010.

Florida currently has no operational ethanol plants in the state. Florida meets this demand for ethanol by imports from refineries outside of the state. Ethanol stations are subject to fire and building code requirements, regulated by the National Fire Protection Association and the Florida Department of Community Affairs respectively. Depending upon the size of the facility, additional

13 Florida Department of Revenue

14 Daily consumption based on data from Florida Department of Revenue.

15 Florida's Energy Future, January 2003.

16 Assumes an average of 1.5% growth annually for the next ten years, based on U.S. Census Bureau population trend from 2000-2004.

permits for storm and wastewater and air emission permits may be required from DEP.

Biodiesel [17]

The total "dedicated" biodiesel production capacity in the United States is approximately 180 million gallons per year. Another 100 million gallons is projected to be online by May 2006 and an additional 470 million gallons are planned nationwide.

In Florida, a multi-feedstock biodiesel plant in Lakeland has the capacity to produce 18 million gallons annually and will eventually produce up to 30 million gallons. Two additional companies have set up biodiesel distribution facilities at the Port of Tampa and Port Everglades.

Hydrogen

Florida's current hydrogen capacity is less than 20 gallons of gasoline equivalent per day (gge/day). Florida currently has one hydrogen energy station in operation, two stations in the construction and permitting stages and two stations in the planning phase. Once permitted and constructed, the two additional hydrogen fueling stations will provide more than 130 additional gallons of gas equivalent per day.

Once all five hydrogen stations are installed and operating, they will meet the demand of 15 vehicles - approximately 290 gallons of gas equivalent per day.

B. Current and Projected Infrastructure Needs for Production and Supply

As the demand for transportation fuels increases over the coming years, Florida's infrastructure for producing, storing and transporting that fuel to market will also increase. The following table summarizes Florida's current and projected transportation fuels capacity.

Transportation Fuel Capacity (million gallons)	Current 2005	Projected
Gasoline – Bulk Storage	342[18]	
Gasoline – Retail Storage	187[19]	
Diesel – Bulk Storage	141	
Diesel – Retail Storage	24	
Ethanol	0	80 MMG/Yr
Biodiesel	18 MMG/Yr	66 MMG/Yr
Hydrogen	3000 gge[20]	

17 National Biodiesel Board

18 Represents bulk storage capacity at the ports. Volume derived from data reported to DEP, Bureau of Petroleum Storage Systems, adjusted down by 20% to account for unused min/max levels kept in the tanks.

19 Represents storage capacity at retail stations. Volume derived from data reported to DEP, Bureau of Petroleum Storage Systems, adjusted down by 10%.

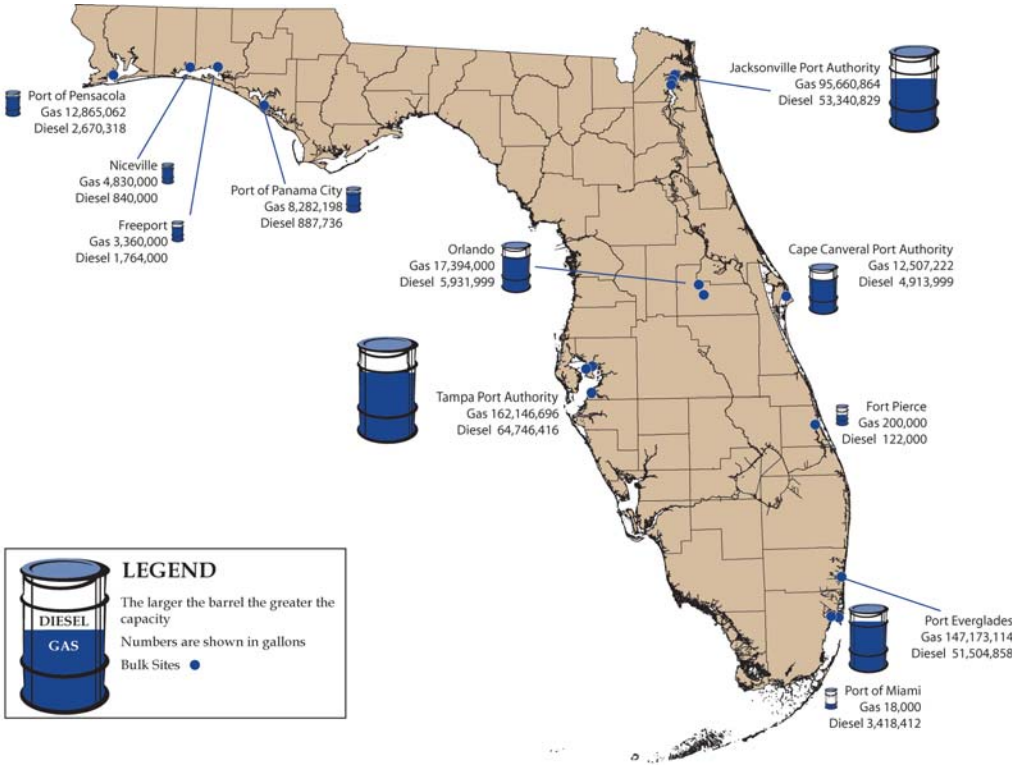
20 gge = gallons of gasoline equivalent.

In-state Oil Production

Florida's oil production capability is approximately 10,000 barrels per day, or 120 million gallons of gasoline per year. Production has been steadily declining for the past few decades due to the declining economic efficiency of the state's oil fields. Crude oil production within Florida is negligible in meeting the state's current or future demand for motor fuel as Florida does not contain any native refinery capacity. Crude oil is moved via pipeline to refineries outside the state for processing.[21] Additional oil production within Florida is not expected to occur within the planning horizon.

Refined Petroleum Products

Florida receives 98 percent of its fuel by sea via barge and tanker ship into seven ports. Ninety percent is received into three ports: the Port of Tampa, the Port of Jacksonville and Port Everglades. The remaining two percent is supplied from out-of-state via tanker truck. Fuel is supplied by domestic and international refineries as well as the pipeline spur in Bainbridge, Georgia.



From bulk storage, fuel is distributed by approximately 1,000 tanker trucks under various commercial arrangements to more than 9,200 retail gas stations in the state.[22] Fuel distribution fluctuates based on the supply and demand for fuel and the business objectives of petroleum companies and suppliers.

21 Sources: Oil and Gas Annual Production Reports, Florida Geological Survey, 2004, and the Florida Petroleum Council, Fuel Fact Sheet

22 Florida Petroleum Council

Ethanol

While there are currently no ethanol production plants in Florida, there is the potential for two or three plants in southwest Florida becoming operational over the next few years with a combined annual production capacity of 80 million gallons.

Florida's seven ethanol fueling stations are not open to the public and serve organizational fleets such as the Department of Transportation.

Biodiesel

Annual biodiesel production capacity in Florida is 18 million gallons and is anticipated to grow to 30 million gallons in the near future. Storage capacity for imported biodiesel is expected to grow to over 36 million gallons within the next year.

The National Biodiesel Board currently lists nine companies as distributors of biodiesel throughout Florida. Biodiesel is not readily available through retail fueling stations.

Hydrogen

Nationally, approximately 20 hydrogen stations providing fuel to controlled fleets are in operation. Florida currently has one station in operation, two stations in the construction and permitting stages and two stations in the planning phase.

- Existing Hydrogen Station in Operation
  - o BP facility on State Road 426 in Oviedo
    - Designed to support controlled fleet of five fuel cell vehicles
    - Generation capacity: <20 gge/day
- Hydrogen Stations Under Construction/Permitting
  - o Chevron Hydrogen Company facility at Boggy Creek Road and Tradeport Drive in Orlando
    - Designed to support controlled fleet of four shuttle buses
    - Generation capacity: <120 gge/day
  - o Hydrogenics facility at the Orlando International Airport
    - Designed to support controlled fleet of two baggage carriers
    - Generation capacity: <16 gge/day
- Planned Hydrogen Stations
  - o Supplier To Be Determined on International Drive in Orlando
    - Designed to support controlled fleet of 4 shuttle buses
    - Generation Capacity: <120 gge/day
  - o Supplier To Be Determined at NASA/Kennedy Space Center in Cape Canaveral
    - Designed to support controlled fleet of two shuttle buses
    - Generation Capacity: <60 gge/day

c. Current and Projected Consumer Costs

Transportation Fuel Consumer Costs ($/gallon)	Current 2005
Diesel	2.30 - 2.60
Ethanol	1.22 - 1.60
Biodiesel	2.40 - 3.70
Hydrogen	$8.56/gge

Ethanol is sold into the gasoline blending market where it competes with other oxygenates, octane components and gasoline. As such, ethanol prices are highly correlated with the price of gasoline and gasoline blending components. Additionally, biodiesel is sold into the diesel blending market and correlates with the price of diesel. Availability of hydrogen is limited to specific fleet applications.

d. Current Regulatory Oversight

The following section is intended to provide highlights of regulatory oversight but may not be all-inclusive.

Refined Petroleum Products

- The U.S. Environmental Protection Agency regulates emissions associated with the combustion of petroleum products and regulates the sulfur content in the fuel.
- The DEP certifies the installation of above ground and underground storage tanks.
- The Florida Department of Agriculture and Consumer Services regulates fuel quality, maintains blending requirements, sets the Reid Vapor Pressure requirements and is responsible for the weights and measures associated with dispensers at retail stations.
- The Florida Department of Revenue applies taxes to petroleum products.
- The Florida Department of Transportation is responsible for all regulation associated with on road distribution including truck weights, tanker truck storage requirements, operational hours, etc.
- The Florida Department of Community Affairs is responsible for all building codes associated with retail facilities and the construction of any structures.
- The Florida Department of Financial Services is responsible for all hazardous material requirements, including fire and safety codes.

Hydrogen Refueling Stations

Codes for permitting both stationary fuel stations and hydrogen motor fuel dispensing stations are currently being developed. The report "The Regulator's Guide to Hydrogen Development" details the methodology to be used in creating these guidelines and was developed through a collaborative effort involving the National Fire Protection Association (NFPA), the International Code Council (ICC), Pacific Northwest National Laboratory and the National Renewable Energy Laboratory. Stationary hydrogen refueling facilities must meet NFPA codes and building codes. Building codes are regulated by the Florida Department of Community Affairs, while the fire codes are created through the NFPA. The Vehicular Fuel Systems Code of 2006, Chapters 12.1

– 14.13.9, is the specific reference for the NFPA rules regarding hydrogen fueling stations.

Ethanol Refueling Stations

Ethanol stations are subject to fire and building code requirements.

Owners or operators of vehicles powered by alternative fuel are required to obtain a valid Alternative Fuel Use Permit from the Florida Department of Revenue. This decal is in lieu of the excise tax on gasoline. Refueling stations are not allowed to fuel an alternative fuel vehicle that does not display the appropriate decal. State and local government alternative fuel vehicle fleets are exempt from paying the decal fee.

Biodiesel Refueling Stations

Pursuant to Chapter 206, F.S., biodiesel is not categorized as an alternative fuel, but as a diesel fuel and is subject to all regulatory issues cited for refined petroleum products. The Florida Department of Revenue alternative fuel decals do not apply to biodiesel.

e. Fuel Efficiency and Alternative Fuel Initiatives in Florida

Florida has the fourth largest number of registered hybrids in the nation. Florida's state government agencies have committed to purchase alternative fuel and clean energy vehicles. More than 22 percent of DEP's fleet is comprised of "green" transportation with more than 90 hybrid vehicles and more than 290 alternative fuel vehicles. The State of Florida's entire vehicle fleet comprises just over 19,000 cars and light trucks. Of that amount, 107 are hybrid and 1,491 are alternative fueled vehicles.[23] Since its inception in 1993, the U.S. Department of Energy's Clean Cities Program -- with 88 coalitions nationwide, including two in Florida -- has helped conserve enough petroleum to fuel two million cars for a year.

The U.S. Department of Energy's Clean Cities Program is advancing the economic, environmental and energy security of the United States by adopting practices that reduce petroleum consumption in the transportation sector. Clean Cities carries out this mission through a network of volunteer coalitions, which develop public/private partnerships to promote alternative fuels and vehicles, fuel blends, fuel economy and hybrid vehicles.

Florida has 28 hydrogen demonstration projects underway and seven state universities are conducting more than 100 hydrogen research and development projects. By 2006, Florida aims to establish metro-Orlando as a "hydrogen hub," building four hydrogen energy stations to supply hydrogen vehicle fleets in Central Florida.

In September 2005, Florida received its first fleet of hydrogen vehicles. Five Ford Focus Fuel Cell vehicles were delivered to the DEP and Progress Energy Florida. The vehicles are in use at Wekiva Springs State Park, DEP's Central District and at Progress Energy's Longwood facility and will also be showcased in regional alternative and clean energy conferences, summits and events.

In January 2006, the DEP, Ford, Hydrogenics, Tug Technologies, and Delta Airlines expect to begin demonstrating hydrogen baggage carriers at the Orlando International Airport. Additionally, in the fall of 2006, DEP, ChevronTexaco and Ford will provide eight hydrogen shuttle busses to the Orlando-area for use in the tourism industry.

23 Florida Department of Management Services

IV. Overview of Florida Statutes

Currently, Florida law addresses energy concerns with several distinct statutory chapters. These statutes provide the institutional structure for the regulation and implementation of energy policy in the State of Florida. Responsibilities for energy regulation and policy implementation are divided between a legislative commission, the PSC and two executive level agencies: the Florida Department of Community Affairs and the DEP.

Chapter 186, F.S.

Chapter 186, F.S., promotes intergovernmental coordination and the effective allocation of resources by outlining a coordinated planning process. Section 186.801, F.S., highlights the requirement that all regulated utilities submit a Ten-Year Site Plan to the PSC. This document estimates a utilities power-generating needs and the general location of its proposed power plant sites.

Chapter 350, F.S.

Chapter 350 F.S. provides the enabling legislation for the utility regulatory body, the PSC. This chapter contains the statutory provisions under which the PSC operates including how commissioners are chosen and confirmed, the purview and statutory authority of the commission, and the funding mechanism through the Florida Public Service Regulatory Service Trust Fund.

Chapter 366, F.S.

Chapter 366, F.S., governs the PSC's jurisdiction over electric and gas utilities.

This statute gives the PSC authority over five broad areas for all electric utilities in the state, including municipals and rural cooperatives. The chapter provides the source for the Commission's rate making authority, including cost recovery. It also specifically addresses cogeneration and small power production, the requirements of the Florida Energy Efficiency and Conservation Act, ensures the development and maintenance of a reliable and coordinated power grid, as well as electric safety requirements.

This chapter directs the PSC to establish and maintain continuous liaison with all other appropriate state and federal agencies whose policy decisions and rulemaking authority affect those utilities over which the commission has primary regulatory jurisdiction.

Chapter 368, F.S.

Chapter 368, F.S., authorizes the establishment of rules and regulations covering the design, fabrication, installation, inspection, testing and safety standards for installation, operation and maintenance of gas transmission and distribution systems, including gas pipelines, gas compressor

stations, gas metering and regulating stations, gas mains, and gas services up to the outlet of the customer's meter set assembly, gas-storage equipment of the closed-pipe type fabricated or forged from pipe or fabricated from pipe and fittings and gas-storage lines.

This Chapter also creates the rate making authority of the PSC for natural gas transmission companies for any service relating to the transmission or sale of natural gas in the state. The section applies only to facilities located wholly within this state for the transmission or delivery for sale of natural gas. Local distribution pipelines are exempt.

Chapter 377, F.S.

Chapter 377, F.S., addresses the regulation, planning and development of the energy resources of the state. It is the policy of the State of Florida to conserve and control the natural resources of oil and gas to prevent waste of natural resources and to safeguard the health, property and public welfare of the citizens of the state.

Chapter 377, F.S., specifically addresses the funding by electric utilities of local governmental solid waste facilities that generate electricity, the Solar Energy Standards Act of 1976, functions of the Florida Department of Community Affair's Energy Emergency Contingency Plan and Federal and State Conservation Programs.

Finally, Chapter 377, F.S., provides the language for the duties and activities of the Florida Energy Office.

Chapter 403, F.S.

Chapter 403, F.S., recognizes that the predicted growth in electric power demand requires the development of a procedure for the selection and utilization of sites for electrical generating facilities and the identification of a state position with respect to each proposed site. Thus, Chapter 403, F.S., outlines the requirements of the Florida Electrical Power Plant Siting Act which applies to any steam or solar electrical generation facility except those that are less than 75 megawatts.

This statute also provides an exclusive forum for determination of need for an electrical power plant. Chapter 403, F.S., addresses electric power transmission concerns by outlining the Transmission Line Siting Act, which applies only to a transmission lines that operates at 230 kilovolts or more, while transmission lines which are less than 15 miles in length or which do not cross a county line are exempt and by providing a process for the determination of need for transmission lines. Chapter 403, F.S., also creates the Natural Gas Pipeline Siting Act. The DEP also regulates electric and magnetic fields from electrical transmission lines under the provisions of sections 403.061(30) and 403.523(14), F.S.

Chapter 553, F.S.

Chapter 553, F.S., addresses thermal efficiency standards by instructing the Florida Department of Community Affiars to provide a thermal efficiency code to provide for a statewide uniform standard for energy efficiency in the thermal design and operation of all buildings statewide, consistent with energy conservation goals, and to best provide for public safety, health, and general welfare.

Chapter 553, F.S., also specifies that the Florida Building Commission shall adopt the Florida Energy Efficiency Code for Building Construction within the Florida Building Code, and shall

modify, revise, update, and maintain the code to implement the provisions of this thermal efficiency code and amendments thereto, in accordance with the procedures of Chapter 120, F.S. The DCA shall, at least triennially, determine the most cost-effective energy-saving equipment and techniques available and report its determinations to the commission, which shall update the code to incorporate such equipment and techniques.

Chapter 553, F.S., addresses energy efficiency by providing statewide minimum standards for energy efficiency in certain products, consistent with energy conservation goals. The standards are required to be based on feasible and attainable efficiencies which will reduce Florida's energy consumption growth rate and the growth rate of energy demand.

Finally, Chapter 553, F.S., outlines the Building Energy Efficiency Rating System to provide for a statewide uniform system for rating the energy efficiency of buildings.

V. Recommendations for Electric Power Generation

Diversification Recommendations

Recommendation #1

Streamline and expedite the siting and permitting of generation resources by revising the provisions of the Florida Electrical Power Plant Siting Act. By 2006, reduce the average processing time for new power plants by three months while maintaining opportunities for public input and protecting Florida's environment. (Department of Environmental Protection, Siting Board)

The Power Plant Siting Act (PPSA) is a centralized, coordinated licensing process encompassing the permitting, land use and zoning, and proprietary interests of all state, regional, and local agencies in the jurisdiction of which an electric power plant is proposed for location. The PPSA provides for a single certification (license) for those electric power plants, as defined by the PPSA, which are steam or solar powered, 75 megawatts or greater, and are constructed after October 1, 1973. The provisions apply to nuclear power, although regulation of nuclear radiation is preempted by the federal government. Only electric utilities as defined by the PPSA may apply for certification. The process includes mandatory land use and certification hearings by an administrative law judge, a Determination of Need by the Public Service Commission (PSC), with ultimate approval/denial authority vested in the Siting Board, which consists of the Governor and Cabinet. The DEP coordinates the process.

While the PPSA has proved an effective mechanism for the licensing of new generation, recommended changes for simplifying and expediting the review process, ensuring protection for the environment and maintaining public participation include:

- Simplifying and streamlining completeness and sufficiency procedures;
- Reducing mandatory hearings;
- Revising time limits;
- Clarifying applicability; and
- Clarifying the statutes defining the authority of the Siting Board to review local government determinations on land use consistency to ensure the successful development of projects critical to the State's welfare.

Improving the efficiency of the PPSA and clarifying provisions will expedite power plant licensing, ensure quicker development of diverse generation infrastructure and enhance reliability.

Recommendation #2

Streamline and expedite the siting and permitting of electric transmission and distribution resources by revising the provisions of the Florida Electrical Transmission Line Siting Act. By 2006, reduce the average processing time for new transmission resources by three months while maintaining opportunities for public input and protecting Florida's environment. (Department of Environmental Protection, Siting Board)

Similar to the PPSA, the Transmission Line Siting Act (TLSA) is a centralized, coordinated licensing process encompassing permitting, land use and zoning, and proprietary interests of all state, regional, and local agencies in the jurisdiction of which a transmission line is proposed for location. The TLSA provides for a single certification (license) for transmission lines subject to the TLSA. Transmission lines subject to the TLSA are those which are 230 kilovolts or greater, 15 miles or more in length and cross a county line. The process includes a mandatory hearing by an administrative law judge, a Determination of Need by the PSC, with ultimate approval/denial authority vested in the Siting Board. The DEP coordinates the process.

Recommended changes for simplifying the TLSA , expediting the review process, improving efficiency and enhancing reliability, while protecting the environment and maintaining public participation include:

- Simplifying and streamlining completeness and sufficiency procedures;
- Reducing mandatory hearings;
- Revising time limits;
- Clarifying who may be an applicant; and
- Clarifying comprehensive planning and zoning issues.

Improving the efficiency of the TLSA and clarifying provisions will expedite transmission line licensing and ensure quicker development of reliable transmission infrastructure.

Recommendation #3

Promote fuel diversity, fuel supply reliability and energy security.

• Provide the Public Service Commission with authority to ensure fuel diversity, fuel supply reliability and energy security as priority considerations when evaluating the state's energy needs. (Public Service Commission, Florida Legislature)

• Study transmission grid reliability to examine the efficiency and reliability of power transfer and emergency contingency conditions. (Public Service Commission)

• Study subterranean placement of distribution lines and the hardening of infrastructure to address issues arising from the 2004 and 2005 hurricane seasons. Upon determination of need, the Legislature should provide the Public Service Commission statutory authority to establish standards to reduce the vulnerability of Florida's power distribution infrastructure to hurricanes. (Public Service Commission)

The Florida PSC is charged with ensuring the development of reliable electric system resources in a manner that is economically competitive and protective of consumers. While a diverse fuel base enhances system reliability and energy security, it is currently not a major factor in the PSC's decision making. Empowering the PSC to include fuel diversity, fuel supply reliability, and energy security as high priorities in its decision making processes will enable the development of a diverse infrastructure in the state.

Chapter 366, Florida Statutes, provides the PSC with the authority and mechanisms for ensuring the provision of adequate, reliable, reasonable cost electricity to consumers. The PSC should support an update of Chapter 366, Florida Statutes, to include fuel diversity and fuel supply reliability as criteria for the installation of new electric generating infrastructure.

Chapter 403.519, Florida Statues, provides the guidelines for a determination of need for an electric generating facility. Prior to building a facility, Rule 25-22.082, Florida Administrative Code, requires that an applicant apply for a determination of need. A clause should be added to Chapter 403.519, Florida Statutes, to ensure the PSC considers fuel diversity and fuel reliability as factors when determining the need for new generation.

With a growing economy, additional transmission capacity will likely become necessary. There also may be a need to improve the efficiency and reliability of transferring power within certain regions of the state. It is therefore recommended that the PSC conduct a study of transmission grid reliability and emergency contingency conditions. The utilities in the state are encouraged to provide assistance to the PSC in conducting the study.

Distribution lines are essential to the delivery of generated power to residential and commercial consumers. These lines are particularly vulnerable to disruption when impacted by a hurricane. The PSC should work with local and state officials to review the feasibility of subterranean placement of distribution lines and other infrastructure hardening issues.

Recommendation #4

Facilitate additional fuel delivery mechanisms in Florida for power generation. Expedite all State permits required for redundancies and increased capacity. (Department of Environmental Protection, Board of Trustees of the Internal Improvement Trust Fund)

The interruption in the supply of natural gas and petroleum resulting from Hurricane Katrina in 2005 left Florida in an extended state of emergency. Source refineries for petroleum and a pipeline delivering a major portion of Florida's natural gas supply were damaged and offline. Because of these major interruptions, Florida's utilities began implementing emergency procedures using back up fuels and urging consumers to reduce electricity consumption and conserve fuel.

Florida can limit interruptions to electric generation fuel supply by diversifying its sources of fuel. Two natural gas pipelines have been approved to deliver liquefied natural gas, and there is interest in establishing additional natural gas and petroleum pipelines. The DEP recommends the State continue to explore mechanisms for creating redundancy in fuel supply and fuel delivery.

Recommendation #5

Adopt updated interconnection standards to include all distributed generation technologies. (Public Service Commission)

Distributed generation refers to self-generated, modular electricity generators sited close to the customer load. Distributed generation technologies include wind, solar, biomass, fuel cells, gas microturbines, hydrogen, combined heat and power, and hybrid power systems. Distributed generation systems can be integrated with electricity provided from a utility, enabling utilities to defer or eliminate costly investments in transmission and distribution system upgrades, and provide customers with better quality, more reliable energy supplies.

PSC Rule 25-6.065, which references the Institute of Electrical and Electronics Engineers' standard IEEE 929, currently allows for streamlined standards for the interconnection of "small photovoltaic systems" of 10 kilowatts or less to the local power grid.

It is recommended that PSC Rule 25-6.065 be expanded to incorporate the updated national standard IEEE 1547, which considers uniform connection standards associated with all distributed generation technologies including larger systems greater than 10 kilowatts. Uniform connection standards will minimize barriers to distributed generation interconnection.

Recommendation #6

By September 1, 2006, establish an energy council of diverse stakeholders to provide policy advice and counsel to the Governor, Speaker of the House and Senate President. (Florida Legislature)

Energy is essential to the economic health of Florida. With the increase in population and demand for energy, and the threat of supply disruptions it is imperative that policy makers are provided with objective recommendations on current and projected energy issues. The council should be comprised of a diverse group of stakeholders, including utility providers, researchers, fuel suppliers, technology manufacturers, environmental interests and others, and should advise the State on ideas and solutions to address energy needs and concerns.

Conservation Recommendations

Recommendation #7

Expedite State performance contracting with Energy Service Companies. By 2006, State government should generate energy savings of over $1 million or 3.5 million kilowatt hours annually as a result of these contracts. (Department of Management Services, Department of Financial Services, State Agencies)

In 1997, the Department of Corrections executed an energy savings contract with Florida Power and Light involving 16 institutions covering 4.6 million square feet. Over four years, the energy service contract has achieved a savings in electric, water and operating costs of more than $1.3 million annually.

In 2003, at the direction of Governor Bush, the State began to initiate contracts with Energy Service Companies (ESCOs) to evaluate State facilities for energy efficiency improvements. The ESCOs operate under performance contracts, receiving payment based on the savings generated for the State.

The DEP recommends the Department of Financial Services, Department of Management Services and State agencies expedite contract negotiations with ESCOs and implement performance contracts to allow earlier construction and energy savings.

Recommendation #8

Promote awareness of energy conservation and alternative energy technologies.

- Incorporate energy conservation, efficiency and alternative energy technologies into curriculum at K-12 public schools and universities. (Department of Environmental Protection)
- Encourage architects, engineers, building contractors, developers and community planners to practice sustainable, energy efficient design and green building strategies. (Department of Environmental Protection)
- Encourage manufacturers and independent power providers to take advantage of waste energy and use cogeneration technologies. (Department of Environmental Protection)

Fostering energy conservation and efficiency begins with awareness. Through a network of existing partners, the State is building understanding about energy conservation, energy efficiency and alterative and renewable energy technologies for the home and workplace.

As advancements in clean energy technologies and energy efficient practices evolve, continued outreach and education is needed to make these opportunities mainstream. For example, Combined Heat and Power (CHP) is an efficient, clean, and reliable approach to generating power and thermal energy from a single fuel source. By better understanding the potential benefit of CHP, Florida's industrial sector can increase operational efficiency and decrease energy costs, while reducing emissions of greenhouse gases.

Other education efforts can have the ability to reach a variety of audiences including the online Utility Report Card for public schools energy officials, training for home builders on energy efficient and hurricane resistant construction practices, case studies on biogas generation for dairy farmers, and energy-related classroom activities for elementary school students.

The DEP is also currently pursuing nearly $380,000 in funding from the State Technologies Advancement Collaborative to lead a five-state initiative to promote ENERGY STAR™ benchmarking tools and technical assistance for K-12 public schools and local governments throughout the Southeast United States. This outreach project builds on Florida's existing SunSmart Schools Program, which has installed 29 solar electric systems in public schools throughout the state. The program combines State funding with private partnerships to generate clean energy used by the school and create a hands-on science project for students.

Recommendation #9

Use discretionary enforcement authority to allow approved alternative energy projects that provide a greater public benefit in lieu of civil monetary penalties. (Department of Environmental Protection)

The DEP has the authority to collect cash penalties for violations of environmental laws. The agency currently manages an enforcement program called "Pollution Prevention Projects in Enforcement" that allows DEP to settle enforcement actions by requiring the completion of an environmental project in lieu of civil penalties. The program requires the company to invest 1.5 times the value of the civil penalty in the pollution prevention project.

Where less serious violations occur, the DEP recommends allowing options for implementing alternative energy or energy efficiency projects in lieu of cash penalties, where the project provides a greater environmental and community benefit than civil enforcement. The DEP would recommend appropriate projects on a case by case basis.

Recommendation #10

Require all new State government building construction to meet the U.S. Green Building Council's Leadership in Environmental Design standards. Encourage local governments and community developers to adopt high performance green building practices. (Department of Management Services, Department of Community Affairs)

State government is leading by example with a strategic goal to reduce energy consumption by 25 percent below 2002 levels at all State government facilities by 2007.

To improve building efficiencies within State government and achieve the 2007 energy reduction goals, all new State buildings should meet the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) standards. Developed by all sectors of the building industry, the LEED program is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings.

To improve building efficiencies outside of State government, the Department of Community Affairs should encourage local governments and community developers to adopt the Florida Green Building Coalition's recommendations for municipalities, such as expediting residential building permits for homes built to high energy efficient standards. Utilities should be encouraged to offer rebates for new and renovated ENERGY STAR™ certified homes.

Economic Incentive Recommendations

Recommendation #11

Provide grant funding for research and demonstration projects associated with the development and implementation of renewable energy systems. Expand solar, hydrogen, biomass, wind, ocean current and other emerging technologies. By 2007, the grant portfolio should realize an aggregate return on investment greater than two to one. (Department of Environmental Protection)

The DEP is currently administering approximately $5 million in grant funding to advance renewable and emerging alternative energy technologies for electricity generation. Additional funding is needed to build on these efforts and continue vital research and demonstration of these next generation technologies.

Industry and the State's universities contain the experience and expertise necessary to improve alternative energy technologies. By sponsoring further research, development and demonstration projects, the State can continue fostering these technologies in the marketplace and spurring economic investment in Florida.

Recommendation #12

Identify alternative energy production and distribution industries as Qualified Target Industries. (Enterprise Florida, Governor's Office of Tourism, Trade and Economic Development, Department of Revenue)

Administered through the Governor's Office of Tourism, Trade, and Economic Development, Qualified Target Industries (QTI) incentives are available to companies that create high wage jobs in targeted industries. Economic incentives include refunds on insurance premiums and corporate income, intangible personal property, sales and ad valorem taxes.

QTI designation will authorize tax refunds for companies that invest in Florida's alternative energy production and distribution industries.

Recommendation #13

Provide consumer and commercial rebates to assist with initial cost of photovoltaic and solar thermal technology installations on residential and commercial buildings. By 2007, achieve at least 725 new solar installations in Florida. (Department of Environmental Protection)

Photovoltaic systems convert sunlight into electrical current but have high initial costs associated with installation. Similarly, while solar water heaters are considered cost effective, the thermal technology has a higher initial cost than traditional fossil-fuel based water heaters. When installed, however, solar water heaters can provide as much as 80 percent of the hot water demand of the typical Florida residence.

By reducing installation costs, a rebate program would create an incentive for utilizing photovoltaic systems and solar water heaters both residentially and commercially. Promoting these technologies would also provide an economic benefit for Florida's native solar industry, reduce consumer energy costs and reduce grid demand at peak times. In addition, photovoltaic systems of two kilowatts or higher power output can supplement grid supplied power.

Subject to appropriation, the DEP will establish a solar rebate program for solar thermal and solar photovoltaic technologies, providing:

- Rebates per installed watt for photovoltaic systems in residential, commercial, public and non-profit applications.
- Rebates for the installation of solar thermal systems, excluding swimming pool heaters. A fixed rebate will be offered for residential applications. For commercial, public and non-profit applications, the rebate will be on a system performance basis.

Recommendation #14

Provide consumer rebates for purchases of energy efficient ENERGY STAR™ appliances. By 2007, achieve an energy savings of 20 million kilowatt hours per year. (Department of Environmental Protection)

ENERGY STAR™ is a government-backed program that promotes the use of industrial and household energy efficient appliances. According to ENERGY STAR™, the national average for household expense for energy bills is $1,500 a year. With ENERGY STAR™ products and home improvements, energy savings can reach 30 percent or more than $450 per year.

Subject to appropriation, the DEP will establish a rebate and incentive program for Florida residents on the purchase of eligible ENERGY STAR™ appliances. Specified funds will be directed toward an incentive program to support residents in low income communities.

Under the 2005 Federal Energy Policy Act, additional federal financial incentives may be available to consumers that purchase ENERGY STAR™ appliances.

Recommendation #15

Provide sales and corporate tax incentives for the manufacture, purchase and use of fuel cells for supplemental and backup power. Grow demand for hydrogen energy technologies by 100 percent over the next two years. (Department of Environmental Protection, Department of Revenue)

Hydrogen fuel cells are unique in terms of the variety of their potential applications, providing energy for systems from laptop computers to utility power stations. Offering several benefits over conventional combustion-based technologies, fuel cells are currently used in many power plants and generators and are virtually pollution free.

Additional investments in the fuel cell industry will continue the advancement of fuel cells for use in backup and supplemental electricity generation and lead to lower cost, higher efficiency products.

Sales and corporate income tax incentives will spur investment in the fuel cell industry promoting advancements and improvements in the technology. Tax incentives will encourage Florida businesses to invest in alternative energy for backup and supplemental power.

V. Recommendations for Transportation Fuels

Diversification Recommendations

Recommendation #1

Facilitate additional and diverse petroleum supply and distribution mechanisms into and within Florida. Expedite all State permits required for redundancies and increased capacity. (Department of Environmental Protection, Board of Trustees of the Internal Improvement Trust Fund)

Florida imports 98 percent of its transportation fuel into three major ports. Although Florida did not experience extended closures at its major ports during the 2004 and 2005 hurricane seasons, the state experienced long lines and limited fuel supplies at retail stations following each storm. In addition, shortages were experienced by emergency responders and electricity generating facilities. The interruption in the supply of petroleum resulting from Hurricane Katrina in 2005 left Florida in an extended state of emergency.

Several factors can impact Florida's fuel supply and the 2004 and 2005 hurricane seasons caused several of them to surface. Reoccurring problems in the current fuel supply and distribution networks can be linked to the following:

• Storage capacity limitations in the Panhandle: In 2004, Hurricane Ivan severely damaged a Transmontaigne fuel terminal in Pensacola. The facility is still closed.

• Seaside re-supply disruptions: Since Florida is dependant upon re-supply via sea, long term port closures impact fuel availability.

• Electricity outages at supply terminals and retail stations: Widespread electricity outages plagued fuel distribution in Florida during the 2004 and 2005 hurricane seasons.

• Inadequate ground transportation of fuel: The 2004 and 2005 hurricane seasons proved that pre and post-storm activities caused demand for fuel to exceed supply at retail stations. A lack of fuel delivery trucks resulted in rapid draw down and retail facility outages.

To meet Florida's increasing demand for fuel, the DEP recommends facilitating the expansion of fuel infrastructure, exploring the feasibility of developing petroleum pipelines to create redundancies in fuel delivery mechanisms and increasing petroleum storage capacity at Florida's ports.

Recommendation #2

Encourage fueling stations to cooperatively adopt a system modeled after the Florida WARN System to facilitate the relocation and use of generators to reestablish service. By June 1, 2006, register 10 percent of Florida's fueling stations as participants in the network. Double participation by June 1, 2007. (Department of Environmental Protection, Florida Petroleum Industry)

During the 2004 and 2005 hurricane seasons some fueling stations used generators to provide electric power to the station and the fueling pumps. This power enabled the stations to quickly return to operation and provide fuel. Fuel stations without generators were reliant on the restoration of local power.

Utilizing a system similar to the Florida WARN (Wastewater/water Agency Response Network) System will facilitate the installation of temporary power to return fuel to hurricane-affected communities without mandating the use of generators at gas stations or requiring government intervention in the market place. A web-based system would enable private entities to share resources. Generators in unaffected areas can be moved to impacted areas by private parties.

Conservation Recommendations

Recommendation #3

Foster state-local partnerships to encourage well-designed transportation and transit systems between established communities and within new community development. (Department of Environmental Protection, Department of Community Affairs, Department of Transportation)

Smart growth is development that serves the economy, community and the environment. The features that distinguish smart growth in a community vary from place to place. In general, sustainable growth invests time, attention, and resources in restoring community and vitality to center cities and older suburbs. This growth tends to be more town-centered, is transit and pedestrian oriented, and has a greater mix of housing, commercial and retail uses. It also preserves open space and many other environmental amenities.

The DEP recommends exploring the potential for partnerships with local planning boards that foster smart growth, with emphasis on improved transportation and transit systems. The partnerships are not intended to create regulations or process but rather to facilitate information sharing about emerging technologies and existing infrastructure that reduce a community's dependence on fossil fuels.

The State should also facilitate continued discussions between the Florida Department of Transportation, local governments and the CSX Corporation to utilize existing freight tracks for commuter rail service in Central Florida. Mass transit projects like this aid in reducing congestion on Florida roads and provide a viable transportation alternative for commuters.

Recommendation #4

Raise public awareness for alternative fuel vehicles through public programs. Encourage public entities, including school districts and local governments, to use biofuels in fleets. (Department of Environmental Protection)

Numerous alternative fuel vehicle options exist, including hybrid electric, biodiesel, ethanol blends, electric, compressed natural gas, liquefied natural gas, propane and hydrogen.

Increased awareness about vehicle options will help foster demand for these alternative fuels and vehicles. Improved market penetration will help economies of scale. Government can lead by example and create market demand to help drive unit costs down.

Economic Incentives

Recommendation #5

Provide grant funding for applied research and demonstration projects associated with the development and implementation of alternative fuel vehicles and other emerging technologies. By 2007, the grant portfolio should realize an aggregate return on investment greater than two to one. (Department of Environmental Protection)

The DEP is currently administering approximately $7 million in grant funding to support transportation-related research, development and demonstrations in alternative fuels and advanced energy technologies in Florida. Additional funding is needed to build on these efforts and continue vital research and demonstration of these next generation technologies.

Industry and the State's universities contain the experience and expertise necessary to improve alternative fuels and energy technologies. By sponsoring further research and demonstration projects, the State can continue to bring these technologies closer to market.

Recommendation #6

Provide sales and corporate income tax credits for hydrogen vehicles and fueling infrastructure. By 2007, increase demand for mobile hydrogen technologies by 50 percent. (Department of Environmental Protection, Department of Revenue)

Worldwide, energy companies, automakers and petroleum companies are investing more than $2 billion annually to expand the hydrogen technology industry. Nationally, President George W. Bush proposed a $1.7 billion, five-year investment to develop hydrogen-powered fuel cells, hydrogen infrastructure and advanced automotive technologies.

Since July 2003, the State has invested $3.8 million for hydrogen research, development and demonstration and has experienced an overall return on investment of nearly four to one. Continued investment from the State will stimulate Florida's hydrogen economy, create incentives for corporate investment, diversify the economy and create high-wage jobs.

Recommendation #7

Provide corporate sales and income tax incentives to improve production, develop distribution infrastructure and increase availability of clean fuels, including biodiesel and ethanol. (Department of Environmental Protection, Department of Revenue)

While biodiesel production capacity in Florida is growing, a large percentage of product is railed out-of-state.

Bulk storage capacity for biodiesel currently exists at the Port of Tampa and Port Everglades, although there are no existing plans for additional storage elsewhere in the state. To reduce costs and increase demand within the state, the DEP recommends expanding bulk storage at main petroleum terminals in Central and North Florida to allow fuel companies to blend biodiesel at the rack. By increasing availability and access, the state can enhance the market for biodiesel.

Fuel-grade ethanol production is growing in Florida and across the nation, although retail access to ethanol-blended fuel is limited. The DEP recommends using E85 (a blend of 85 percent ethanol and 15 percent gasoline) to fuel government fleets with flex-fuel vehicles, creating an immediate market for E85 and spurring private investment in infrastructure. The DEP also recommends exploring the potential for lower blends of ethanol, such as E10 (a blend of 10 percent ethanol with 90 percent gasoline), which may be viable for mainstream use without the need for flex-fuel vehicles.

Corporate sales and income tax credits will be offered to the production, storage and distribution of clean fuels. Investment from the State will stimulate investment in Florida, create incentives for corporate investment, diversify the economy and create high-wage jobs.

In addition to the economic incentives proposed by the State, the U.S. Department of Agriculture (USDA) has a comprehensive energy strategy to help farmers and ranchers deal with high energy costs. As part of its support for energy projects, the USDA awarded $1.2 million in Small Business Innovation Research grants to eight projects involving biomass fuels, byproducts, and power. In addition, the USDA's Rural Development program plans to maximize its use of approximately $1.4 billion in various business and electric loans and loan guarantees to help farmers, ranchers, and rural communities create renewable energy systems and businesses. This program provides guarantees up to eighty percent of a loan made by a commercial lender. The DEP recommends utilizing federal loans by Florida businesses to expand and enhance ethanol production in the state.