Progress Energy

July 21, 2008

VIA ELECTRONIC MAIL

Mr. Mark Futrell
Public Utilities Supervisor
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Re: RPS Data Collection

Dear Mr. Futrell:

Please find attached Progress Energy Florida, Inc.'s ("PEF") completed RPS Data Collection forms. Thank you for the opportunity to provide this RPS data and should you have any questions, please don't hesitate to contact me at (727) 820-5184.

Sincerely,

John T. Burnett LMS

John T. Burnett
Associate General Counsel

JTB/lms
Attachments

RPS Data Form 1: Renewable Generating Technologies

Company Name: Progress Energy Florida

Applicable Utility Service Area: Mid to North-west Florida Regions

Renewable Technologies:
Solar
Photovoltaic (PV)
Photoelectrochemical (H2)
Thermal Electric Plant
Wind
Inland
Coastal
Offshore
Hydroelectric
Dam (Incremental)
Diversion (Run of the River)
Pumped Storage
Geothermal
Dry Steam
Flash
Binary
Ocean Energy
Wave Action
Tidal Change
Thermal Gradients (OTEC)
Ocean Currents
Biomass - Direct Combustion
Plant Matter
Animal Waste
Vegetable Oil
Biomass - Conversion to Liquid
Biodiesel / Renewable Diesel
Ethanol - Cellulosic
Ethanol - Non-Cellulosic
Pyrolysis
Biomass - Conversion to Gas
Anaerobic Digester
Gasification
Renewable Natural Gas
Landfill Gas
Methane Combustion
Municipal Solid Waste
Biogenic
Non-Biogenic
Hydrogen, renewable
Fuel Cells
Combustion
Waste Heat
Sulfuric Acid Manufacturing

RPS Data Form 2: Conventional Generating Technologies

Company Name: Progress Energy Florida

Applicable Utility Service Area: Mid to North-west Florida Regions

Conventional Technologies:
Natural Gas
Combustion Turbine
Combined Cycle
Coal
Integrated Gasified Combined Cycle
Supercritical Pulverized Coal
Nuclear
Steam Generation

RPS Data Form 3: Commercial Availability Data

Company Name: Progress Energy Florida

Applicable Utility Service Area: Mid to North-west Florida Regions

Energy Resource	Typical Unit Annual Capacity Rating (MW)	Earliest Commercial In-Service Date (Year)	Typical Construction & Permitting Time (Years)	Useful Life of Unit (Years)	Fuel Type	
Conventional Technologies:						
Natural Gas						
Combustion Turbine	198	2010	2	25	Nat Gas	
Combined Cycle	1200	2013	4	25	Nat Gas	
Coal						
Integrated Gasified Combined Cycle	625	2014	6	25	Coal	
Supercritical Pulverized Coal	850	2013	5	40	Coal	
Nuclear						
Steam Generation	1120	2016	8	40	uranium	
Renewable Technologies:						
Solar						
Photovoltaic (PV)	0.002-0.01	2009	<1	25	Solar	
Photoelectrochemical (H2)	0.002	2011	1	25	Solar	
Thermal Electric Plant	75	2013	2	25	Solar	
Wind						
Inland	0.002-0.010	2009	1	20	Wind	
Coastal	0.002-0.010	2010	1.5	20	Wind	
Offshore	2	2014	6	20	WInd	
Hydroelectric						
Dam (Incremental)	1 to 3	2013	4	50	Water	
Diversion (Run of the River)	1 to 3	2013	4	50	Water	
Pumped Storage	1	2013	4	50	Water	
Geothermal						
Dry Steam					Earth-heat	Not applicable in Florida
Flash					Earth-heat	Not applicable in Florida
Binary					Earth-heat	Not applicable in Florida
Ocean Energy						
Wave Action	0.75	2010	1	20	Water	Ocean technologies still in developmental phase
Tidal Change	10	2010	1	20	Water	
Thermal Gradients (OTEC)					Water	OTEC systems currently are restricted to experimental and demonstration units
Ocean Currents					Water	There are no commercial grid connected turbines operating
Biomass - Direct Combustion						
Plant Matter	50	2012	3	30	Wood	Stoker
Animal Waste	50	2013	4	30	Manure	Poultry Litter on Stoker Grate
Vegetable Oil	Same as Oil-Fired CT	2012	3	15	Biomass	Same as Oil fired CT
Biomass - Conversion to Liquid						

RPS Data Form 3: Commercial Availability Data

Company Name: Progress Energy Florida

Applicable Utility Service Area: Mid to North-west Florida Regions

Energy Resource	Typical Unit Annual Capacity Rating (MW)	Earliest Commercial In-Service Date (Year)	Typical Construction & Permitting Time (Years)	Useful Life of Unit (Years)	Fuel Type	
Biodiesel / Renewable Diesel	Same as Oil-Fired CT	2012	3	15	Biomass	Same as Oil fired CT
Ethanol - Cellulosic	N/A	2020	N/A	N/A	Biomass	Ethanol is typically a transportation fuel, It is not considered a power generation fuel
Ethanol - Non-Cellulosic	N/A	2012	N/A	N/A	Biomass	Ethanol is typically a transportation fuel, It is not considered a power generation fuel
Pyrolysis	Same as Oil-Fired CT	2030	5	15	Biomass	
Biomass - Conversion to Gas						
Anaerobic Digester	0.15	2012	3	30	Biomass	
Gasification	50	2015	4	30	Biomass	
Renewable Natural Gas	Same as CT w/NG	2015	3	15	BioGas	Renewable NG is a biogas that is upgraded to NG qualtiy and burned as NG. Renewable feedstocks could be from landfills, digesters, etc.. It is assumed it is burned in a CT as direct replacement for NG.
Landfill Gas						
Methane Combustion	5	2013	4	30	Methane	
Municipal Solid Waste						
Biogenic	50	2013	2	30	Waste	
Non-Biogenic	50	2013	2	30	Waste	
Hydrogen, renewable						
Fuel Cells	0.002	2011	1	10	Solar/Hydrogen	
Combustion	Same as natural gas fired CT	2013	4	25	Hydrogen	
Waste Heat						
Sulfuric Acid Manufacturing	5	2010	2	30	Wst Heat	

RPS Data Form 4: Performance Characteristics Data

Company Name: Progress Energy Florida

Applicable Utility Service Area: Mid to North-west Florida Regions

Energy Resource	Contribution to Summer Peak Demand (MW)	Contribution to Winter Peak Demand (MW)	Average Annual Heat Rate (BTU/kWh)	Equivalent Avail Factor (%)	Average Annual Generation (MWH)	Resulting Capacity Factor (%)	
Conventional Technologies:							
Natural Gas							
Combustion Turbine	175	201	10,359	77	173,448	10	
Combined Cycle	1,161	1,258	7,163	92	6,832,800	65	
Coal							
Integrated Gasified Combined Cycle	620	630	8,309	87	4,653,750	85	
Supercritical Pulverized Coal	850	859	8,844	92	6,329,100	85	
Nuclear							
Steam Generation	1,092	1,120	9,715	92	8,830,080	90	
Renewable Technologies:							
Solar							
Photovoltaic (PV)	.0015-.0076	0	N/A	15	2 to 12	15	
Photoelectrochemical (H2)	.0015-.0076	0	N/A	15	2 to 12	15	
Thermal Electric Plant	75	75	N/A	18	100,000	18	
Wind							
Inland	0.002-0.010	0	N/A	10	1.6 - 8.4	10	
Coastal	0.002-0.010	0	N/A	10	1.6 - 8.4	10	
Offshore	1	minimal	N/A	50	4,000,000	45	
Hydroelectric							
Dam (Incremental)	1 to 3	1 to 3	N/A	70	6,000 to 18,000	85	
Diversion (Run of the River)	1 to 3	1 to 3	N/A	70	6,000 to 18,001	85	
Pumped Storage	1	1	N/A	70	6,000 to 18,002	85	
Geothermal							
Dry Steam							Not applicable in Florida
Flash							Not applicable in Florida
Binary							Not applicable in Florida
Ocean Energy							
Wave Action	0.75	0.75	N/A	85	1000	15%	Ocean technologies still in developmental phase
Tidal Change	10	10	N/A	98	41732	48%	
Thermal Gradients (OTEC)							OTEC systems currently are restricted to experimental and demonstration units
Ocean Currents							There are no commercial grid connected turbines operating
Biomass - Direct Combustion							
Plant Matter	50	50	13750	94	370000	85	
Animal Waste	50	50	13750	90	350000	80	
Vegetable Oil	Same as Oil-Fired CT	Same as Oil-Fired CT	Same as Oil-Fired CT	Same as Oil-Fired CT	Same as Oil-Fired CT	Same as Oil-Fired CT	
Biomass - Conversion to Liquid							
Biodiesel / Renewable Diesel	Same as Oil-Fired CT	Same as Oil-Fired CT	Same as Oil-Fired CT	Same as Oil-Fired CT	Same as Oil-Fired CT	Same as Oil-Fired CT	

RPS Data Form 4: Performance Characteristics Data

Company Name: Progress Energy Florida

Applicable Utility Service Area: Mid to North-west Florida Regions

Energy Resource	Contribution to Summer Peak Demand (MW)	Contribution to Winter Peak Demand (MW)	Average Annual Heat Rate (BTU/kWh)	Equivalent Avail Factor (%)	Average Annual Generation (MWH)	Resulting Capacity Factor (%)	
Ethanol - Cellulosic	0	0	0	0	0	0	Ethanol is typically a transportation fuel, It is not considered a power generation fuel
Ethanol - Non-Cellulosic	0	0	0	0	0	0	Ethanol is typically a transportation fuel, It is not considered a power generation fuel
Pyrolysis	Same as Oil-Fired CT	Same as Oil-Fired CT	Same as Oil-Fired CT	Same as Oil-Fired CT	Same as Oil-Fired CT	Same as Oil-Fired CT	
Biomass - Conversion to Gas							
Anaerobic Digester	0.15	0.15	14000	90	1000	79	
Gasification	50	50	11000	94	370000	85	
Renewable Natural Gas	Same as CT w/NG	Same as CT w/NG	Same as CT w/NG	Same as CT w/NG	Same as CT w/NG	Same as CT w/NG	
Landfill Gas							
Methane Combustion	5	5	13,500	85	37,250	85	
Municipal Solid Waste							
Biogenic	47	55	12200	80	398580	83%	NESSIE
Non-Biogenic	47	55	12200	80	398580	83%	NESSIE
Hydrogen, renewable							
Fuel Cells	0.002	0.002	N/A	96%	16	94%	
Combustion	Same as CT w/NG	Same as CT w/NG	Same as CT w/NG	Same as CT w/NG	Same as CT w/NG	Same as CT w/NG	
Waste Heat							
Sulfuric Acid Manufacturing	5	5	15500	80	35040	80%	PCS

RPS Data Form 5: Environmental Characteristics Data

Company Name: Progress Energy Florida

Applicable Utility Service Area: Mid to North-west Florida Regions

Energy Resource	Emission Rates: Carbon Dioxide (CO2) (lb/kWh)		Sulfur Dioxide (S02) (lb/kWh)		Nitrogen Oxide (NOx) (lb/kWh)	Mercury (Hg) (lb/kWh)		Water Usage (aal/kwh)		Typical Unit Annual Capacity Rating (MW)	
Conventional Technologies:											
Natural Gas											
Combustion Turbine	1.26		0		3.4E-04	0		0.09		198	
Combined Cycle	0.845		0		7.9E-05	0		0.234		1200	
Coal											
Integrated Gasified Combined Cycle	1.98		4.5E-04		2.6E-04	5.96E-08		0.173		625	
Supercritical Pulverized Coal	1.83		1.3E-03		5.3E-04	1.65E-08		0.518		850	
Nuclear											
Steam Generation	0		0		0	0		2.58		1120	
Renewable Technologies:											
Solar		Notes		Notes			Notes		Notes		
Photovoltaic (PV)	See Note	1	Negligible		Negligible	Negligible		Unknown		0.002-0.01	emissions found at 300 lb/MWh Note 1
Photoelectrochemical (H2)	Unknown		Negligible		Negligible	Negligible		Unknown		0.002	
Thermal Electric Plant	Unknown		Negligible		Negligible	Negligible		Unknown		75	
Wind											
Inland	See Note	1	Negligible		Negligible	Negligible		Unknown		0.002-0.010	emissions found at 60 lb/MWh Note 1
Coastal	See Note	1	Negligible		Negligible	Negligible		Unknown		0.002-0.010	emissions found at 60 lb/MWh Note 1
Offshore	See Note	1	Negligible		Negligible	Negligible		Unknown		1	emissions found at 60 lb/MWh Note 1
Hydroelectric											
Dam (Incremental)	See Note	1	Negligible		Negligible	Negligible		N/A		1 to 3	emissions found at 9 lb/MWh Note 1
Diversion (Run of the River)	Unknown		Negligible		Negligible	Negligible		N/A		1 to 3	
Pumped Storage	See Note	1	Negligible		Negligible	Negligible		N/A		1	emissions found at 519 lb/MWh Note 1
Geothermal											
Dry Steam	Negligible		Negligible		Negligible	Negligible		Unknown			
Flash	Negligible		Negligible		Negligible	Negligible		Unknown			
Binary	Negligible		Negligible		Negligible	Negligible		Unknown			
Ocean Energy											
Wave Action	Unknown	2	Negligible		Negligible	Negligible		N/A		0.75	
Tidal Change	Unknown	2	Negligible		Negligible	Negligible		N/A		10	
Thermal Gradients (OTEC)	Unknown	2	Negligible		Negligible	Negligible		N/A			OTEC systems currently are restricted to experimental and demonstration units
Ocean Currents	Unknown	2	Negligible		Negligible	Negligible		N/A			There are no commercial grid connected turbines operating
Biomass - Direct Combustion											
Plant Matter	0		0.001		0.0016	0		same as coal		50	

RPS Data Form 5: Environmental Characteristics Data

Company Name: Progress Energy Florida

Applicable Utility Service Area: Mid to North-west Florida Regions

Emission Rates

Energy Resource	Carbon Dioxide (CO2) (lb/kWh)		Sulfur Dioxide (S02) (lb/kWh)		Nitrogen Oxide (NOx) (lb/kWh)		Mercury (Hg) (lb/kWh)	Water Usage (aal/kwh)		Typical Unit Annual Capacity Rating
Animal Waste	0		0.001		0.0035		0	same as coal		50
Vegetable Oil	0		Same as Oil-fired CT.		Same as Oil-fired CT.		Same as Oil-fired CT.	Same as Oil-fired CT.		Same as Oil-Fired CT.
Biomass - Conversion to Liquid										
Biodiesel / Renewable Diesel	0		Same as Oil-fired CT.		Same as Oil-fired CT.		Same as Oil-fired CT.	Same as Oil-fired CT.		Same as Oil-Fired CT
Ethanol - Cellulosic	0		N/A		N/A		N/A	N/A		N/A
Ethanol - Non-Cellulosic	0		N/A		N/A		N/A	N/A		N/A
Pyrolysis	0		Same as Oil-fired CT.		Same as Oil-fired CT.		Same as Oil-fired CT.	Same as Oil-fired CT.		Same as Oil-Fired CT.
Biomass - Conversion to Gas										
Anaerobic Digester	0		0		0.0004		0	0		0.15
Gasification	0		0.001		0.0016		0	same as coal		50
Renewable Natural Gas	0		same as CT w/NG		same as CT w/NG		same as CT w/NG	same as CT w/NG		Same as CT w/NG
Landfill Gas										
Methane Combustion	117	3	1	4	92	4	Negligible	Unknown		5
Municipal Solid Waste										
Biogenic	0.8		0.0008		0.0008		0	Same as coal	NESSIE	50
Non-Biogenic	0.8		0.0008		0.0008		0	Same as coal	NESSIE	50
Hydrogen, renewable										
Fuel Cells	Unknown		Unknown		Unknown		Unknown	Unknown		0.002
Combustion	Unknown		Unknown		Unknown		Unknown	Unknown		Same as natural gas fired CT.
Waste Heat										
Sulfuric Acid Manufacturing	Unknown		Unknown		Unknown		Unknown	Unknown		5

Notes: 1 - IAEA (Source) lists emissions in lb/MWh for life-cycle (includes manufacture, operation, and disposal)

2- operation should produce no emissions; life cycle may produce emissions

3 - emissions are pounds per million Btu. Source: EIA

4 - emissions are pounds per billion Btu. Source: EIA

RPS Form 6: Estimated Cost Data

Company Name: Progress Energy Florida

Applicable Utility Service Area: Mid to North-west Florida Regions

Energy Resource	Installed Capital Data			Fixed O&M Data		Variable O&M Data		Energy			
	1st Yr Com. Operation (Year)	Cost[1] ($/kW)	Escal. Rate (%)	Cost[1] ($/kW-Yr)	Escal. Rate (%)	Cost[1] ($/kWh)	Escal. Rate (%)	Cost[1] ($/kWh)	Escal. Rate (%)	Levelized Cost[2] - Life of Unit (cents/kWh)	
Conventional Technologies:											
Natural Gas											
Combustion Turbine	2010	483	3.00	61.16	2.25	0.0120	2.25	0.1042	1.33	11	No fuel in Levelized Cost
Combined Cycle	2013	1007	4.00	7.09	2.25	0.0020	2.25	0.0565	2.37	2	No fuel in Levelized Cost
Coal											
Integrated Gasified Combined Cycle	2014	4407	3.00	51.14	2.25	0.0039	2.25	0.0261	2.54	9	No fuel in Levelized Cost
Supercritical Pulverized Coal	2013	2193	3.00	16.35	2.25	0.0054	2.25	0.0247	2.54	3	No fuel in Levelized Cost
Nuclear											
Steam Generation	2016	7771	3.00	63.27	2.25	0.0032	2.25	0.0084	1.00	12	No fuel in Levelized Cost
Renewable Technologies:											
Solar											
Photovoltaic (PV)	2008	7,000	3	16	3	0.001	3	N/A	N/A	54	
Photoelectrochemical (H2)	2010	17,000	3	20	3	0.001	3	N/A	N/A	128	
Thermal Electric Plant	2011	4,000	3	16	3	0.001	3	N/A	N/A	31	
Wind											
Inland	2009	7,500	3	40	3	0.0001	3	N/A	N/A	95	
Coastal	2010	7,500	3	40	3	0.0001	3	N/A	N/A	95	
Offshore	2013	16,000	3	42	3	0.0001	3	N/A	N/A	41	
Hydroelectric											
Dam (Incremental)	2013	900 - 1,200	3	7.5	3	0	-	N/A	N/A	1 - 2	
Diversion (Run of the River)	2013	900 - 1,200	3	7.5	3	0	-	N/A	N/A	1 - 2	
Pumped Storage	2013	900 - 1,200	3	7.5	3	0	-	N/A	N/A	1 - 2	
Geothermal											
Dry Steam											Not applicable in Florida
Flash											Not applicable in Florida
Binary											Not applicable in Florida
Ocean Energy											
Wave Action	2010	5290	6	264	3	N/A	N/A	N/A	N/A	67	Ocean technologies still in developmental phase
Tidal Change	2010	2845	6	111	3	N/A	N/A	N/A	N/A	10	
Thermal Gradients (OTEC)	2025										OTEC systems currently are restricted to experimental and demonstration units
Ocean Currents	2025										There are no commercial grid connected turbines operating
Biomass - Direct Combustion											
Plant Matter	2012	2700	6	100	2.5	0.002	2.5	Same as Pulverized Coal	Same as Coal	8.9	
Animal Waste	2013	5000	6	200	2.5	0.003	2.5	2 times Pulverized Coal	Same as Coal	9.9	

RPS Form 6: Estimated Cost Data

Company Name: Progress Energy Florida

Applicable Utility Service Area: Mid to North-west Florida Regions

Energy Resource	Installed Capital Data: 1st Yr Com. Operation (Year)	Installed Capital Data: Cost[1] ($/kW)	Installed Capital Data: Escal. Rate (%)	Fixed O&M Data: Cost[1] ($/kW-Yr)	Fixed O&M Data: Escal. Rate (%)	Variable O&M Data: Cost[1] ($/kWh)	Variable O&M Data: Escal. Rate (%)	Energy: Cost[1] ($/kWh)	Energy: Escal. Rate (%)	Levelized Cost[2] - Life of Unit (cents/kWh)	
Vegetable Oil	2012	Same as Oil-fired CT.	6	Same as Oil fired CT.	2.5	Same as Oil-fired CT.	2.5	Same as Oil-fired CT.	Same as Oil-fired CT.	1-2 times CT w/oil.	Capital and non-fuel O&M are same as oil-fired CT. Fuel costs vary depending on feed stock. Total Levelized costs are 1 to 2 times CT w/oil.
Biomass - Conversion to Liquid											
Biodiesel / Renewable Diesel	2012	Same as Oil-fired CT.	6	Same as Oil fired CT.	2.5	Same as Oil-fired CT.	2.5	1-3 times CT w/oil.	Same as Oil-fired CT.	1-2 times CT w/oil.	Capital and non-fuel O&M are same as oil-fired CT. Fuel costs vary depending on feed stock. Total Levelized costs are 1 to 2 times CT w/oil.
Ethanol - Cellulosic	2020	N/A	6	N/A	2.5	N/A	2.5	N/A	N/A	N/A	Ethanol is typically a transportation fuel, not a power generation fuel
Ethanol - Non-Cellulosic	2012	N/A	6	N/A	2.5	N/A	2.5	N/A	N/A	N/A	
Pyrolysis	2030	Same as Oil-fired CT.	6	Same as Oil fired CT.	2.5	Same as Oil-fired CT.	2.5	1-3 times CT w/oil.	Same as Oil-fired CT.	1-2 times CT w/oil.	Capital and non-fuel O&M are same as Natural Gas CT. Fuel costs vary depending on feed stock. Total Levelized cost ar 1 to 2 times CT w/NG.
Biomass - Conversion to Gas											
Anaerobic Digester	2012	4000	6	60	2.5	0.004	2.5	Same as CT w/NG	2.5	7.9	
Gasification	2013	3700	6	95	2.5	0.002	2.5	Same as CT w/NG	2.5	11.1	
Renewable Natural Gas	2015	Same as CT w/NG.	6	Same as CT w/NG.	2.5	Same as CT w/NG.	2.5	1-3 times CT w/NG.	Same as CT w/NG.	1-2 times CT w/NG.	Capital and non-fuel O&M are same as Natural Gas CT. Fuel costs vary depending on feed stock. Total Levelized cost ar 1 to 2 times CT w/NG.
Landfill Gas											
Methane Combustion	2013	1,500 - 2,000	3	30	3	0.0042	3			3 -4	
Municipal Solid Waste											
Biogenic	2013	3496	6	65	3	0.002	3		3	6	NESSIE
Non-Biogenic	2013	3496	6	65	3	0.002	3		3	6	NESSIE
Hydrogen, renewable											
Fuel Cells	2011	10,000	3	17	3	0.0043	3			130	w/o hydrogen cost
Combustion	2011	1,300	4	7	2.25	0.002	2.25			2	w/o hydrogen cost
Waste Heat											
Sulfuric Acid Manufacturing	2010	1300	6	7.14	2.25	0.002	2.25			2	