## GAINESVILLE REGIONAL UTILITIES' LONG TERM ELECTRICAL SUPPLY PLAN

Presented to Alachua County Board of County Commissioners November 23, 2004



### We Need Base Load Capacity



### **USA Oil And Gas Production Has Peaked**

	Years of	
Fuel	Reserve	% Imported
Oil	16	52%
Gas	52	18%
Coal	480	0

**Source: U.S. DOE Energy Information Administration** 

# We Are Concerned About The Cost Of Fuels



Here's What We Hear From Our Community Outreach:

Our Community Expects:

- A Clean Environment
- Reliable Electric Supplies
- Resource Conservation And Renewable Energy
- Affordable Electric Rates
- A Financially Strong Utility

# We Reviewed A Wide Range Of Technologies

**Biomass Cofiring Biomass Gasifiers Biomass Stand Alone Bubbling Bed Boilers** Circulating Fluidized Bed Cogeneration (heat and power) Combustion Turbines - combined cycle Combustion Turbines - simple cycle **Direct Load Control Distributed Generators** Fuel Cells Geothermal Hydro-Electric Integrated Gasification Combined Cycle **Market Purchases** 

**Microturbines** Nuclear Plasma Arc Reduction Pulverized Coal Pulverized Coal - subcritical Pulverized Coal - supercritical **Refuse Derived Fuel Units** Repowering DH1 Solar Concentrating Collectors Solar Photovoltaic Solar Thermal Electric Solid Fuel Gasifiers **Tidal Generators** Wave Energy Generators Wind Turbines

### Finding The Balance

Environmental Quality (September 30)

**Customer Needs For Electricity** Conservation and Renewable Energy (November 1)

Affordability and Reliable Supply (November 15)

# Our Proposed Long Range Energy Supply Plan

- Energy Conservation
  - 7 New Programs
- Renewable Energy
  - **EGRU** *reen*
  - Biomass (Waste Wood)
- Solid Fuel Capacity (220 MW CFB)
  - Waste Wood
  - Coal
  - Petroleum Coke
- Additional Emission Controls
- Use of Reclaimed Water

### **CFB: Proven, Efficient and Flexible** (Circulating Fluidized Bed)



\*Conceptual Diagram

#### Emissions Would Be Reduced – Even With Higher Sulfur Fuels

	CURRENT - Deerhaven 2		FUTURE - Deerhaven 2 & CFB	
	Permitted	Actual	Permitted	Expected
Parameter	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)
SO <sub>2</sub>	12,761.6	6,992.6	3,707.5	2,800.4
NO <sub>X</sub>	7,444.2	3,316.5	1,580.3	1,215.7
PM	1,063.5	162.9	296.3	227.9
Hg	N/A	71 lbs/yr	N/A	20 lbs/yr

Note: Ambient air quality concentrations are not linearly related to mass reductions in emissions

# EFFECTS OF EXISTING AND PROPOSED POWER PLANTS ON AMBIENT AIR QUALITY

#### Air Modeling Results Sample Average Annual $NO_X$ Contributions From GRU Generation - 2003 Operations





#### Annual Average NO<sub>X</sub> Maximum Point Contributions In Alachua County



#### Annual Average SO<sub>2</sub> Maximum Point Contributions In Alachua County



#### Annual Average PM/PM<sub>10</sub> Maximum Point Contributions In Alachua County



#### 24-Hour Average PM/PM<sub>10</sub> Maximum Point Contributions In Alachua County



#### Annual Average PM<sub>2.5</sub> Maximum Point Contributions In Alachua County



#### 24-Hour Average PM<sub>2.5</sub> Maximum Point Contributions In Alachua County



### Overall CO<sub>2</sub> Intensity Would Be Reduced By 14%

Year	Carbon Emissions (Million Tons CO <sub>2</sub> )	Carbon Intensity* (Ib-CO2/Gross MWh)
2003	1.8	1,998
2012	3.2	1,721

 Adjusted To Reflect No Offsets in 2003. Carbon Offsets Include Treating Biomass As Carbon Neutral, Methane Reductions from Landfill Gas, Demand Side Management, Equipment Effiecency Upgrades and Photovoltiac Electric Installations.

## Affordability And Reliability Require Us To Manage Risk



# Potential Electric Supply Risks Change Through Time

- Financial Risks Are Relatively Minor Until Equipment Orders Are Placed
- This Is 3 to 4 Years After The Design Process Starts

### Each Step Of Our Proposed Process Provides Safeguards

- 1. Review By A Qualified And Independent Consultant (R.W. Beck)
- 2. Prepare An Engineering Design
  - Establish 220 MW CFB Costs
  - Establish Performance Criteria
- 3. Request Bids Against 220 MW CFB Option
  - Open To Alternative Technologies
  - Open To Creative Risk Management And Performance Ideas
- 4. Based On Outcome Of Bid Process, Finalize Plan

### Our Process Has Many Safeguards (Continued)

- 5. Obtain A "Determination of Need" From The Florida Public Service Commission
- 6. Obtain "Site Certification" From The Governor And Cabinet
  - County Has Legal Standing
- 7. Obtain Federal And State Environmental Permits
  - Extensive Public Participation
- 8. Secure Firm Contractual Commitments For Excess Capacity In Early Years
  - Eliminates Market Risks

### The Range Of Forecasts We've Tested



### The Range Of Natural Gas And Coal Prices We've Tested



### Range Of Potential Carbon Prices We've Tested (\$/Ton Carbon By 2015)

	LOW	<u>HIGH</u>
<ul> <li>Carper Bill<sup>1</sup></li> </ul>	\$18	\$ 51
<ul> <li>McCain Lieberman<sup>2</sup></li> </ul>	\$44	\$106
<ul> <li>Range Tested</li> </ul>	\$50	\$100

- 1. EIA Analysis of S.485 "The Clear Skies Act of 2003" and S.843 "The Clean Air Planning Act of 2003". Unsuccessful Legislation.
- 2. Charles River Associates analysis of S.139. Unsuccessful Legislation.

Source: <u>An Assessment of AEP's Actions To Mitigate The Economic Impacts of Emissions Policies</u>, American Electric Power, August 2004

## **Alternative Plans For Comparison**

(2005 Construction Costs-\$Million)

Plan	Cost
•Solid Fuel	
–220 MW CFB	
<ul> <li>Biomass</li> </ul>	\$415
<ul> <li>Coal</li> </ul>	ΨΤΙΟ
<ul> <li>Pet Coke</li> </ul>	
–Deerhaven 2 Retrofit	
Natural Gas	
-240 MW Combined Cycle	\$223
–Deerhaven 2 Retrofit	
<ul> <li>Rent Capacity</li> </ul>	
-Market Purchases	\$73
–Deerhaven 2 Retrofit	

# Savings From Solid Fuel Plan Are Substantial And A Sound Investment

	(\$ Millions)	
Scenario	Present Value Savings Compared To Rented Capacity	Benefit <sup>1</sup> To Cost <sup>2</sup> Ratio
Minimum Savings Potential <sup>3</sup>	191	1.6
Mid-Range Forecasts <sup>4</sup>	753	3.2
Maximum Savings Potential <sup>5</sup>	1,418	5.1

1. Benefits = Difference in total net present value costs from "Rent Capacity" plan plus present value of incremental capacity cost of plan

- 2. Cost = Present value of incremental capital cost compared to "Rent Capacity" plan
- 3. Smallest gas-coal price spread, low est customer demand forecast, \$100/ton carbon tax
- 4. Mid range fuel price spread and customer demand forecast, \$50/ton carbon tax
- 5. Biggest gas-coal price spread, highest customer demand forecast, \$0/ton carbon tax

## A Typical Residential Customer's Bill Would Be Much Less



# The Proposed Plan Is Robust Because It:

- 1. Improves Our Ability To Use Relatively Inexpensive And Abundant Domestic Fuels
- 2. Includes Substantial Investments In State-Of-The-Art Emission Control Technology And Improves Ambient Air Quality
- 3. Maximizes The Use Of Regionally Available Renewable Energy
  - Reduces Carbon Intensity
  - Promotes Local Industry
- 4. Has The Lowest Cost Under A Wide Range Of Customer Demands And Fuel Price Forecasts