Renewable Energy and Interconnection to the Grid

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• City-Owned Utility
• Electric, Gas, Water, Wastewater, Reclaimed Water and Telecommunications
• 612 MW of generating capacity (coal, gas, nuclear, landfill gas, solar)
• Approximately 88,000 customers
Project Chronology

• 1982 Field Study of SWH Impacts
• 1980s Low-Interest SWH Loans
• 1991 Solar Days Workshop
• 1993 One of the First Green Pricing Programs
• 1996 PV10 Array (Systems Control)
• 1997 SWH Rebate
• 2000 Began Developing LFGE Project
• 2002 Standard PV Interconnect & Buy-Back
• 2003 2.3 MW LFGE Project Commissioned
• 2004 Two -- Solar in Schools Projects
• 2005 Proposing 30 MW of Biomass-Fired Capacity
• 2006 Ten kW PV at Regional Airport
• 2012 Proposed 15% Renewables/EE Goal (+10%)
Resource Assessment

**Biomass:** forestry & yard waste, dedicated crops, anaerobic wastewater treatment gasification, landfill gas, municipal solid waste (incl. red bag waste, carpet & tires)

**Solar:** PV, SWH, Passive Design (new construction)

**Others:** wind, hydro, geothermal, tidal, wave, etc.
Resource Assessment

- Determining Sustainable Yield
- Intermittent Nature of Resource
- Fuel Supply Infrastructure
- Competition for Fuels
- Energy Conversion Technologies
- Interconnection Issues
- Feasibility Analyses
Interconnection Issues: Small Generators

- Applies to Inverter-controlled generators of less than 10 kilowatt capacity
- Florida requires Investor-Owned Utilities to allow interconnection of photovoltaic systems <10 kW
- GRU developed a standard interconnection and excess power buyback agreement available at: http://www.gru.com/Pdf/Photovoltaic5.pdf
- Based upon IEEE 929-2000 (UL 1741 protocol)
- Buyback scenarios (i.e., net and dual metering)
Interconnection Issues: Larger Generators

- Parallel Generation and Transmission Constraints
- Qualified Facility Status and Avoided Cost
- Transmission systems regulated by the Federal Energy Regulatory Commission (FERC)
- Process of Interconnection Rulemaking
- Promulgation of IEEE 1547
- Ancillary Documents to IEEE 1547
- Case Study: GRU Landfill Gas to Energy Project
Alachua County Southwest Landfill
LFGE Project
What is GRUgreen Energy?

• Energy produced from a blend of renewable resources
  – Local Biomass
  – Local Solar
  – Wind – TRECps purchased from Iowa
GRUgreen Energy

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