Environmental Sustainability Symposium
August 28, 2009

JEA’s Renewable Program

Jay Worley - Director, Environmental Programs
Company Overview

- 8th largest electric public utility in the nation
- 2nd largest water/wastewater utility in Florida
- JEA serves Duval and portions of Clay, Nassau, and St Johns Counties in Northeast Florida

**Electric System**
- >400,000 electric customers

**Water and Sewer Systems**
- >300,000 water customers
- >200,000 sewer customers
● JEA’s Clean Power Program

● State / Federal Legislation
**JEA CLEAN POWER PROGRAM**

7.5 percent clean power capacity by 2015

**KWp Capacity**

- **Solar PV**: 321 KWp
- **Solar Thermal**: 9,760 KWp
- **Biogas**: 15,800 KWp
- **Wind**: 10,000 KWp
- **Efficiency**: 43,000 KWp

**Note:**
- **Solar PV**: JEA has installed 35 solar PV systems on Duval public schools, local college and university, local public buildings and on JEA facilities.
- **Solar Thermal**: JEA encourages the use of solar energy by providing financial incentives to customers who install solar water heaters.
- **Biogas**: JEA utilization of landfill gas from City of Jacksonville’s North and Girvin Rd. landfills and the Trail Ridge landfill gas to energy.
- **Wind**: JEA has a 10MW share of a wind farm in Nebraska.
- **Efficiency**: Represents JEA production facility improvements which results in additional power for the same fuel input.
Capacity vs. Energy

Renewable Energy Credit
**JEA Clean Power Program**

**Current Status: Capacity**

<table>
<thead>
<tr>
<th>Clean Power Program</th>
<th>KW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar Power- PVs</td>
<td>321</td>
</tr>
<tr>
<td>Solar Thermal</td>
<td>9,760</td>
</tr>
<tr>
<td>Biogas</td>
<td>15,900</td>
</tr>
<tr>
<td>Wind</td>
<td>10,000</td>
</tr>
<tr>
<td>Biomass</td>
<td>Under evaluation</td>
</tr>
<tr>
<td>Efficiency Projects</td>
<td>43,000</td>
</tr>
<tr>
<td><strong>Total Planned/Implemented</strong></td>
<td><strong>78,981 = 79 MW</strong></td>
</tr>
</tbody>
</table>

Goal FY2015: (7.5%): 315 MW
### American Clean Energy & Security Act of 2009

**H.R. 2454**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>%</th>
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<tbody>
<tr>
<td>2012</td>
<td>6.0</td>
</tr>
<tr>
<td>2013</td>
<td>6.0</td>
</tr>
<tr>
<td>2014</td>
<td>9.5</td>
</tr>
<tr>
<td>2015</td>
<td>9.5</td>
</tr>
<tr>
<td>2016</td>
<td>13.0</td>
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<tr>
<td>2017</td>
<td>13.0</td>
</tr>
<tr>
<td>2018</td>
<td>16.5</td>
</tr>
<tr>
<td>2019</td>
<td>16.5</td>
</tr>
<tr>
<td>2020</td>
<td>20.0</td>
</tr>
<tr>
<td>2021 through 2039</td>
<td>20.0</td>
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</tbody>
</table>
### JEA RENEWABLE PROGRAM

**Current Status: Energy (Est.)**

<table>
<thead>
<tr>
<th>Renewable Program</th>
<th>MWh</th>
</tr>
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<tbody>
<tr>
<td>Solar Power- PVs</td>
<td>170</td>
</tr>
<tr>
<td>(Est. juwi annual = 22,430)</td>
<td></td>
</tr>
<tr>
<td>Solar Thermal</td>
<td>Efficiency Component</td>
</tr>
<tr>
<td>Biogas: North, Girvin, &amp; Trail Ridge Landfills, Buckman Wastewater</td>
<td>75,000</td>
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<tr>
<td>Wind: NPPD</td>
<td>30,000</td>
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<tr>
<td>Biomass</td>
<td>TBD (est. 400,000)</td>
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<tr>
<td>Efficiency Projects</td>
<td>TBD</td>
</tr>
<tr>
<td>Total Planned/Implemented</td>
<td>TBD</td>
</tr>
</tbody>
</table>

**JEA - Est. Annual MWHs / Year = 12.8 MM MWh**

- 6% = 768,000 MWh
- 20% = 2.56 MM MWh

**Est. w/biomass & juwi Solar = 550,000 MWh**
Different Technologies, Different Costs

Reflects scalable, reliable technology, with significant output potential.

Reflects technology which is difficult to scale, with very limited output potential.
TRAIL RIDGE LANDFILL – 144 Acres
US Highway 301 S., Baldwin, FL

Placement of Waste Material

Cover of Waste Material
Landfill Gas Extraction
TRAIL RIDGE: Six Engines
9.6 MW
Trail Ridge Benefits

- **Energy**: 9.1 MW = 4,500 homes
- **Reliable**: 85% Capacity Factor
- **Environment**: Methane is a greenhouse gas and will be used as a renewable resource in lieu of flaring
- **Environmental Attributes**: JEA receives green tags, RECs, CO\(_2\) credits, or other similar rights
- **Economic**: $0.046/kWh
- **Renewable Energy Tax Credit**: Trail Ridge Energy, LLC receives tax credit.
JACKSONVILLE SOLAR PROJECT

- JEA / juwi: Purchase Power Agreement
- The 12.6 Megawatt (MW) AC facility will consist of approximately 200,000 photovoltaic panels on a 100 acre site and generate about 22,430 megawatt-hours (MWh) of electricity a year.
- Over the course of a year, this project will generate the same amount of power as about 1,450 households consume
- Will offset approximately 22,430 US tons of greenhouse gas emissions annually
• 40 MW located in Saxony, Germany – on a former military airfield – online ‘08
• Size = .4 miles wide, 1.3 miles long = 200 soccer fields
• If Installed in Jacksonville with avg. Annual Capacity Factor = 15% = 6 MW
SOLAR PV PPA UPDATE
Provides up to 12.6 MW AC

- Proposed to be located on 100 acres of JEA property
- 200,000 modules (each module is 2’ by 4’)

[Diagram of solar panel location and layout]
BIOMASS PPA UPDATE

- Confidentiality agreement
- Nominal 50 MW electric power generation facility
- Features low emissions and very high combustion efficiencies
- Secured fuel source
JEA RENEWABLES NET METERING UPDATE

- Up to 100 kW system
- Monthly credit roll-over
- End of calendar year
JEA: RENEWABLE ENERGY RISING ON THE HORIZON

QUESTIONS?