GEORGIA POWER ADVANCED SOLAR INITIATIVE (GPASI)

OVERVIEW OF THE PROGRAM

28th Annual Environmental Permitting Summer School

July 24, 2014
Agenda

• Background – Why Solar in GA?
• 2012 Advanced Solar Initiative (ASI)
• 2013 ASI Prime
<table>
<thead>
<tr>
<th>Rank</th>
<th>Operator Name</th>
<th>Facility Name</th>
<th>Type</th>
<th>State</th>
<th>Summer Capacity (MWs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>US Bureau of Reclamation</td>
<td>Grand Coulee</td>
<td>Hydro</td>
<td>WA</td>
<td>7,079</td>
</tr>
<tr>
<td>2</td>
<td>Arizona Public Service Co</td>
<td>Palo Verde</td>
<td>Nuc</td>
<td>AZ</td>
<td>3,937</td>
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<tr>
<td>3</td>
<td>Florida Power and Light Co</td>
<td>Martin</td>
<td>Gas</td>
<td>FL</td>
<td>3,695</td>
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<tr>
<td>4</td>
<td>NRG Texas LLC</td>
<td>W A Parish</td>
<td>Coal/Gas</td>
<td>TX</td>
<td>3,675</td>
</tr>
<tr>
<td>5</td>
<td>Florida Power and Light Co</td>
<td>West County Energy Center</td>
<td>Gas</td>
<td>FL</td>
<td>3,669</td>
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<tr>
<td>6</td>
<td>Georgia Power</td>
<td>Scherer</td>
<td>Coal</td>
<td>GA</td>
<td>3,406.7</td>
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<tr>
<td>7</td>
<td>Florida Power and Light Co</td>
<td>Turkey Point</td>
<td>Nuc/Gas</td>
<td>FL</td>
<td>3,334</td>
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<td>8</td>
<td>Tennessee Valley Authority</td>
<td>Browns Ferry</td>
<td>Nuc</td>
<td>AL</td>
<td>3,309.4</td>
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<tr>
<td>9</td>
<td>Georgia Power Co</td>
<td>Bowen</td>
<td>Coal</td>
<td>GA</td>
<td>3,234</td>
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<tr>
<td>10</td>
<td>Progress Energy Florida Inc</td>
<td>Crystal River</td>
<td>Nuc/Coal</td>
<td>FL</td>
<td>3,155</td>
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</tbody>
</table>
## STATES WITH HIGHEST EMISSIONS

Source: EPA, 6/02/2014

<table>
<thead>
<tr>
<th>State</th>
<th>2012 Emissions (million metric tons)</th>
<th>2012 Energy Output (TWh)</th>
<th>2012 Fossil Rate (lbs/MWh)</th>
<th>2012 Fossil, Renewable and Nuclear Rate (lbs/MWh)</th>
<th>2030 State Goal (lbs/MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas</td>
<td>223.15</td>
<td>378.96</td>
<td>1,420</td>
<td>1,298</td>
<td>791</td>
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<tr>
<td>Florida</td>
<td>107.60</td>
<td>197.60</td>
<td>1,238</td>
<td>1,200</td>
<td>740</td>
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<tr>
<td>Pennsylvania</td>
<td>105.83</td>
<td>151.46</td>
<td>1,627</td>
<td>1,540</td>
<td>1,052</td>
</tr>
<tr>
<td>Ohio</td>
<td>92.86</td>
<td>110.65</td>
<td>1,897</td>
<td>1,850</td>
<td>1,338</td>
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<tr>
<td>Indiana</td>
<td>91.78</td>
<td>105.23</td>
<td>1,991</td>
<td>1,923</td>
<td>1,531</td>
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<tr>
<td>Illinois</td>
<td>87.19</td>
<td>101.44</td>
<td>2,189</td>
<td>1,895</td>
<td>1,271</td>
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<tr>
<td>Kentucky</td>
<td>82.89</td>
<td>84.69</td>
<td>2,166</td>
<td>2,158</td>
<td>1,763</td>
</tr>
<tr>
<td>Missouri</td>
<td>70.93</td>
<td>79.64</td>
<td>2,010</td>
<td>1,963</td>
<td>1,544</td>
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<tr>
<td>Alabama</td>
<td>68.56</td>
<td>104.64</td>
<td>1,518</td>
<td>1,444</td>
<td>1,059</td>
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<tr>
<td>West Virginia</td>
<td>65.61</td>
<td>71.64</td>
<td>2,056</td>
<td>2,019</td>
<td>1,620</td>
</tr>
<tr>
<td>Michigan</td>
<td>63.38</td>
<td>82.40</td>
<td>1,814</td>
<td>1,696</td>
<td>1,161</td>
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<tr>
<td>Georgia</td>
<td>57.02</td>
<td>83.80</td>
<td>1,598</td>
<td>1,500</td>
<td>834</td>
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<tr>
<td>North Carolina</td>
<td>53.13</td>
<td>71.17</td>
<td>1,772</td>
<td>1,646</td>
<td>992</td>
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<tr>
<td>Oklahoma</td>
<td>47.86</td>
<td>76.07</td>
<td>1,562</td>
<td>1,387</td>
<td>895</td>
</tr>
<tr>
<td>Wyoming</td>
<td>45.36</td>
<td>47.28</td>
<td>2,331</td>
<td>2,115</td>
<td>1,714</td>
</tr>
<tr>
<td>Louisiana</td>
<td>44.52</td>
<td>66.97</td>
<td>1,533</td>
<td>1,466</td>
<td>883</td>
</tr>
<tr>
<td>California</td>
<td>43.73</td>
<td>138.04</td>
<td>900</td>
<td>698</td>
<td>537</td>
</tr>
<tr>
<td>Colorado</td>
<td>38.45</td>
<td>49.45</td>
<td>1,959</td>
<td>1,714</td>
<td>1,108</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>38.39</td>
<td>46.33</td>
<td>1,988</td>
<td>1,827</td>
<td>1,203</td>
</tr>
<tr>
<td>Tennessee</td>
<td>37.41</td>
<td>43.33</td>
<td>2,015</td>
<td>1,903</td>
<td>1,163</td>
</tr>
</tbody>
</table>
TOP 5 GREEN HOUSE GAS EMITTERS IN 2012

Source: EPA, September 2013
GENERATION PROJECTIONS

Electric generating capacity additions (2000-2040)

Source: EIA, July 2014
Figure 2. Average price of photovoltaic cells and modules, 2003-2012

PROS AND CONS TO SOLAR/RENEWABLES IN THE SOUTHEAST

Answer: Vulnerable to climate change and untapped resources

Advantages
- Clean Energy
- Hedge on Coal
- Compliments Nat Gas
- Large Investments
- ITC
- Public acceptance

Pitfalls
- No RPS/No Incentives
- Expensive?
- Power Sector Dominated by Large Investor-owned Utilities
- Resource constrained
- Politics
• Approved by the Georgia Power Public Service Commission in November 2012
• Contract 210 MW of solar capacity by Dec 2014
• Provide economic growth within the solar industry without upward rate and reliability impacts to consumers
TWO PROGRAMS

• Small and Medium Size Scale Purchase Programs
  – Sell distributed solar back to Georgia Power
  – Seeking 45 MW

• Utility Scale RFP
  – Offer developers the opportunity to bring large PV arrays to market through competitive bidding
  – Seeking 165 MW
Objective - Procure nearly 500 MW of Capacity by end of 2016
- 70 MW of GPASI
- 400 MW of GPASI Prime

Benefits of the RFP Process
- Bid into one or multiple offerings
- Creates efficiencies in administrating RFP
BIDDING OPPORTUNITIES

• ASI – 70 MW Carry-over
  – No bidder shall submit bids for projects less than 1 MW and greater than 20 MW and prices over $120 / MW

• ASI Prime 2015 – 210 MW
  – Projects not less than 1 MW and no greater than 210 MW

• ASI Prime 2016 – 215 MW
  – Projects not less than 1 MW and no greater than 215 MW
SCHEDULING CONSIDERATIONS

• Federal Investment Tax Credit (ITC) decreases from 30% to 10% after 2016.
• Transmission interconnection is a significant obstacle
PRICING

• The weighted all-in cost of the projects awarded from 2013 was approximately 8.5 cents per kWh, which is below the 20 year levelized avoided cost projections
• PPA will be for 100% of energy output
• RECs and beneficial environmental attributes may be offered
  – Non-price factor
BIDDING

• A non-refundable bid fee of $5,000 or $250 per MW (whichever is greater) is required for each unique bid

• Each bid may be offered into any of the portfolios for which it qualifies
  – ASI, ASI-Prime 2015, or ASI-Prime 2016

• Each bid may offer two pricing alternatives for each portfolio for which it applies
  – Fixed price for the 20 year term
  – A schedule of 20 annual prices
RFP SCHEDULE

• Bids and Bidders’ Fee Due - April 30, 2014
• Complete Grid Improvement Evaluations of Competitive Tier Sites - August 8, 2014
• Bid Evaluations reviewed with Staff and IE - August 12, 2014
• Short list, Reserve List and Release List Determination - August 14, 2014
• Negotiate and Finalize PPAs - October 3, 2014
• Release of Reserve List Bidders - October 10, 2014
• File Executed PPAs with the Georgia Public Service Commission - October 10, 2014
• Expected Certification Order by GPSC - December 16, 2014
• Required Commercial Operation Date for Resources - 2015 - December 31, 2015
• Required Commercial Operation Date for Resources - 2016 - December 31, 2016
“THE MONOPOLY COMPANIES CONTROL THE SELLING OF ELECTRICITY NOT THE GENERATION OF ELECTRICITY.” – LAUREN “BUBBA” MCDONALD, GA PUBLIC SERVICE COMMISSIONER

HTTP://WWW.GEORGIAPOWER.COM/ABOUT-ENERGY/ENERGY-SOURCES/SOLAR/ASI/ADVANCED-SOLAR-INITIATIVE.CSHTML

HTTPS://GPASI.ACCIONPOWER.COM/_SOLAR_1401/ACCIONHOME.ASP
NUMBER 1 REASON FOR RENEWABLE ENERGY:
The estimates show the potential gigawatts of rated capacity that could be installed on land above a given gross capacity factor (without losses) at 80 m and 100-m heights above ground. Areas greater than 30% at 80 m are generally considered to have suitable wind resource for potential wind development with today’s advanced wind turbine technology. AWS Truewind, LLC developed the wind resource data for windNavigator® (http://navigator.awstruewind.com) with a spatial resolution of 200 m. NREL filtered the wind potential estimates to exclude areas unlikely to be developed, such as wilderness areas, parks, urban areas, and water features (see Wind Resource Exclusion Table for more detail).
AVERAGE WIND SPEEDS IN FLORIDA

Florida - Annual Average Wind Speed at 30 m

Florida - Annual Average Wind Speed at 80 m

The average wind speeds indicated on this map are model-derived estimates that may not represent the true wind resource at any given location. Small terrain features, vegetation, buildings, and atmospheric effects may cause the wind speed to depart from the map estimates. Expert advice should be sought in placing wind turbines and estimating their energy production.

Florida - Wind Resource Potential
Cumulative Rated Capacity vs. Gross Capacity Factor (CF)

The estimates show the potential megawatts of rated capacity that could be installed on land above a given gross capacity factor (without losses) at 80-m and 100-m heights above ground. Areas greater than 30% at 80 m are generally considered to have suitable wind resource for potential wind development with today’s advanced wind turbine technology. AWS Truewind, LLC developed the wind resource data for windNavigator® (http://navigator.awstruewind.com) with a spatial resolution of 200 m. NREL filtered the wind potential estimates to exclude areas unlikely to be developed, such as wilderness areas, parks, urban areas, and water features (see Wind Resource Exclusion Table for more detail).

[Graph showing cumulative rated capacity vs. gross capacity factor for 80 and 100 m heights]
METEOROLOGICAL TOWERS ARE KEY TO UNDERSTANDING LOCAL WIND PROFILES