NON-RATEPAYER ENERGY EFFICIENCY OPTIONS

Tuesday, Dec. 2 | 2–3 p.m. EST
Presented by CSG South
Virginia Department of Mines, Minerals and Energy

Al Christopher
Director, Division of Energy
Richmond, Virginia
Department of Mines, Minerals and Energy

- Energy DE
- Mineral Mining DMM
- Gas and Oil DGO
- Geology and Mineral Resources DGMR
- Mined Land Reclamation DMLR
- Mines DM
VA has more stringent emission reduction and rate goals than many other states.
Developing Consistency in EM&V Approaches and Emissions Reduction Calculations for Energy Savings Performance Contracting Programs

Project Team

Project Summary

- Over $5 billion is invested in ESPC programs annually; however, states face significant barriers to expanding these programs, tracking results, and integrating them into compliance plans for EPA’s 111(d) rule.
- ESPC could be a key strategy for states to comply with 111(d) targets, especially those states that lack robust ratepayer-funded energy efficiency programs.
- This proposal brings three states together—Virginia, Georgia, and Kentucky—to determine a consensus EM&V approach for ESPC programs that would meet EPA’s requirements for EM&V under Section 111(d) rules.
- The states will also identify attributes and potential structures for how energy efficiency and CO2 reduction credits could be tracked.

Project Objectives and Impact

1) Convene energy offices, air agencies, regional EPA officials, ESCOs, and other stakeholders to develop a consensus approach on EM&V, energy savings to CO2 conversions, and other key issues related to ESPC projects in the context of EPA’s 111(d) proposal;
2) Pilot appropriate ESPC tracking and accounting platforms (eProject Builder) and determine other appropriate structure to track emissions credits from ESPC projects;
3) Document and standardize the processes and approach for adoption by other statewide ESPC and public, federal, or commercial facility retrofit programs.

Takeaway: States that lack ratepayer funded energy efficiency programs need other options to integrate energy efficiency into 111(d) compliance plans. ESPC is a great fit, given the level of investment by states across the country. This project will help states identify an appropriate EM&V protocol and energy efficiency/emissions reductions tracking approach that would enable them to utilize ESPC projects in 111(d) compliance plans. This result would help motivate states to expand their ESPC programs and also help provide greater cross-state consistency regarding EM&V.

Team Information

Prime Recipient: Virginia Department of Mines, Minerals and Energy (DMME)
Principal Investigator: Al Christopher, Director, DMME
Key Participants: DEDI (Lee Colten, Greg Guess); GEFA (David Gipson, Chris White, Kris Anderson); NASEO (David Terry, Chris Wagner, Melissa Savage), CESI (David Dayton, Steve Morgan), SEEA (Cyrus Bhedwar, Wesley Holmes), NAESCO (Donald Gilligan), and NACAA (Phil Assmus)
EPA CAA Part 111(d) – the role for third-party delivered energy efficiency projects

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Building Technologies Division
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Climate change and global warming threatens our existence.
From Awareness to Hammer!

Climate change and global warming threatens our existence
Climate change and global warming threatens our existence

U.S. EPA’s Clean Power Plan and Energy Efficiency and Renewable Energy Compliance Options

From Awareness to Hammer!
Why Buildings?

40% of the world energy consumption*  

21% of the global GHG emissions***

Energy accounts for 40% of the building operation cost**


2 December 2014  
Webinar  
Southern Legislative Conference of The Council of State Governments
Ten Steps to Programmatic, Market-based EE Reductions

1. Establish Third-Party Delivered EE Program
2. Include EE Program in State Implementation Plan
3. Develop EE Projects
4. Approve and Register EE Projects
5. Secure Emissions Credits/Incentives for Projects
6. Install and Commission Projects
7. Measurement and Verify Projects
8. Address Project Performance Shortfalls
9. Evaluate, Measure and Verify Program Performance
10. Address Program Performance Shortfalls

2 December 2014
Webinar
Non-Ratepayer Energy Efficiency Options
Southern Legislative Conference of The Council of State Governments
NASEO Affiliates Want to Assist

Understanding
Commitment
Participation
Education
Prepared to Deliver
Opportunity is missed by most people as it is dressed in overalls and looks like work.

Thomas Edison
Appendix

The appendix slides were created by and included by permission of Clay Nessler of Johnson Controls. The work efforts was part of a collaborative effort between Siemens, Johnson Controls, Schneider, United Technologies, Trane, NORESCO, and Honeywell to illustrate the benefits of including energy services contracting as a cost effective and proven measure to reduce carbon emissions.
Ten Steps to Programmatic, Market-based EE Reductions

1. Establish Third-Party Delivered EE Program
2. Include EE Program in State Implementation Plan
3. Develop EE Projects
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6. Install and Commission Projects
7. Measurement and Verify Projects
8. Address Project Performance Shortfalls
9. Evaluate, Measure and Verify Program Performance
10. Address Program Performance Shortfalls
Ten Steps to Programmatic, Market-based EE Reductions
- Straw Man Model for Illustration Purposes -

1. **Establish Third-Party Delivered EE Program**
   - ESPC enabling legislation
   - Executive order targeting public sector reductions
   - Enabling legislation such as PACE, on-bill repayment, school debt limit exceptions, audit requirements, retrofit requirements, others...
   - ESCO qualification and contract standardization
   - Project M&V requirements and independent evaluation requirements
   - State responsibilities (project registry, emissions crediting, EM&V)

2. **Include EE Program in State Implementation Plan**
   - Follow EPA guidelines and assure that emissions reductions are permanent, enforceable, quantifiable and surplus
   - Include third-party program savings in emissions projections after adjusting for energy imports and savings funded by other state programs (utility incentives)
Ten Steps to Programmatic, Market-based EE Reductions
- Straw Man Model for Illustration Purposes -

3. Develop EE Projects
- Preliminary audit determines project feasibility based on energy savings and payback
- Customer commitment based on project financials
- Investment grade audit refines energy efficiency measure savings
- ESPC defined including M&V plan, financing, utility incentives/rebates and emissions credits

4. Approve and Register EE Projects
- ESCO submits ESPC project details to state program administrator and/or national energy efficiency registry for review and approval
- Project entered into state/national project registry detailing guaranteed energy savings, carbon reductions, implemented measures, measure life, contract term, M&V details and incentives/rebates/.emissions credit allocation and ownership
Ten Steps to Programmatic, Market-based EE Reductions
- Straw Man Model for Illustration Purposes -

5. Secure Emissions Credits/Incentives for Projects
- Secure state/utility incentives for individual efficiency measures or...
- Secure state/utility custom incentives for kWh/kW reduction or...
- Sell certified emissions credits from registry to utilities or... other method
- Crediting for emission reductions may be adjusted prospectively based on periodic (e.g., every three years) state EE program level evaluation, measurement and verification (EM&V)

6. Install and Commission Projects
- ESCO engineers, installs, and commissions the energy efficiency improvements
- ESCO completes pre- and post-installation verification of measure integrity and savings effectiveness
- ESCO establishes operations and maintenance schedule and performance assurance plan
Ten Steps to Programmatic, Market-based EE Reductions - *Straw Man Model for Illustration Purposes*

7. **Measurement and Verify Projects**
   - Completion of first year measurement and verification (M&V) report using EPA and state approved protocols (e.g., IPMVP, FEMP, ASHRAE)
   - Project M&V report reviewed and approved by state program administrator
   - Project M&V subject to independent audit at program administrator's discretion (and expense)
   - Excess energy savings can be banked to cover future year shortfalls
   - Annual inspection of installed measures and/or spot checks of energy savings is typically required to assure savings persistence

8. **Address Project Performance Shortfalls**
   - Project savings short-falls can be compensated for with previous banked excess reductions, additional improvements implemented by the ESCO in future years or ESCO purchase of emission credits
Ten Steps to Programmatic, Market-based EE Reductions
- Straw Man Model for Illustration Purposes -

9 Evaluate, Measure and Verify Program Performance
- State provides independent evaluation of the third-party EE program (e.g., every three years) consistent with other utility/state EE programs
- EPA approved program-level EM&V protocols are applied to a random sample of projects leveraging project and measure-level M&V reports to streamline evaluation complexity and cost
- Results are compared to project-level savings projections, project-level M&V reports and program-level savings targets and used to adjust energy efficiency “realization factors” prospectively applied at a program level

10 Address Program Performance Shortfalls
- Program-level shortfalls can be compensated by over-performance in other EE programs, including additional sectors in the executive order, increased project-level financial incentives or through actions in other building blocks (e.g., fuel switching).
Georgia Energy Performance Contracting
Southern Legislative Conference

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December 2, 2014
Energy Resources
- Georgia Energy Challenge
- Weatherization
- State Energy Program
- State Utilities Program
- Energy Assurance
- Performance Contracting
- State Energy Strategy

Land Conservation Program
- Land purchase financing
- Conservation easements
- Tax credits

Fuel Tank Program
- Remediation
- Monitoring
- Training

Water Resources
- Water and sewer financing
- Solid waste financing
- Water conservation
- Water supply financing
Water Resources Division

- Water and sewer financing
- Solid waste financing
- Water conservation
- Water supply planning and financing
GEFA Programs

GEFA Water and Sewer Infrastructure Financing Programs

State Funding
- Georgia Fund
  - State bond funds and loan repayments
- GA Reservoir and Water Supply Fund
  - State bond funds

Federal Funding
- Clean Water SRF
  - Federal appropriations, state bond funds (match funds) and loan repayments
- Drinking Water SRF
  - Federal appropriations, state bond funds (match funds) and loan repayments
# Water, Wastewater and Land Conservation Loans

GEFA low-interest rate loans approved by the GEFA board, FY84 through End of May 2014

<table>
<thead>
<tr>
<th>Program</th>
<th>Number</th>
<th>Amount ($)</th>
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<tbody>
<tr>
<td><strong>Water and Wastewater</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Georgia Fund</td>
<td>1,323</td>
<td>1,718,495,153</td>
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<tr>
<td>Clean Water SRF</td>
<td>278</td>
<td>1,673,688,672</td>
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<tr>
<td>Drinking Water SRF</td>
<td>291</td>
<td>377,852,065</td>
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<tr>
<td>Water Supply</td>
<td>21</td>
<td>159,544,366</td>
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<tr>
<td><strong>Water / Wastewater Subtotal</strong></td>
<td>1,913</td>
<td>3,929,580,256</td>
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<tr>
<td><strong>Land Conservation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Georgia Land Conservation Program</td>
<td>44</td>
<td>69,387,575</td>
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<tr>
<td><strong>Total Board Approvals</strong></td>
<td>1,957</td>
<td>$3,998,967,831</td>
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# Water Resources Division

<table>
<thead>
<tr>
<th>Program</th>
<th>5-Year Loan</th>
<th>10-Year Loan</th>
<th>15-Year Loan</th>
<th>20-Year Loan</th>
<th>Annual Borrowing Maximum</th>
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</thead>
<tbody>
<tr>
<td>Benchmark Rate</td>
<td>0.76%</td>
<td>1.52%</td>
<td>2.27%</td>
<td>3.03%</td>
<td>--</td>
</tr>
<tr>
<td>Georgia Fund</td>
<td>0.76%</td>
<td>1.52%</td>
<td>2.27%</td>
<td>3.03%</td>
<td>$3,000,000</td>
</tr>
<tr>
<td>Georgia Fund – Interim Finance</td>
<td>0.76%</td>
<td>1.52%</td>
<td>2.27%</td>
<td>3.03%</td>
<td>$3,000,000</td>
</tr>
<tr>
<td>Georgia Fund – Water or Energy Conservation or WaterFirst</td>
<td>0.51% (25 bp reduction)</td>
<td>1.02% (50 bp reduction)</td>
<td>1.52% (75 bp reduction)</td>
<td>2.03% (100 bp reduction)</td>
<td>$3,000,000</td>
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<tr>
<td>Georgia Fund – Environmental Emergency</td>
<td>0.51% (50 bp reduction)</td>
<td>1.27% (100 bp reduction)</td>
<td>N/A</td>
<td>N/A</td>
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</tr>
<tr>
<td>Georgia Fund - PlanFirst</td>
<td>0.51% (25 bp reduction)</td>
<td>1.27% (50 bp reduction)</td>
<td>1.77% (50 bp reduction)</td>
<td>2.53% (50 bp reduction)</td>
<td>$3,000,000</td>
</tr>
<tr>
<td>Clean Water State Revolving Fund (CWSRF)</td>
<td>0.50% (100 bp reduction)</td>
<td>0.52% (100 bp reduction)</td>
<td>1.27% (100 bp reduction)</td>
<td>2.03% (100 bp reduction)</td>
<td>$25,000,000</td>
</tr>
<tr>
<td>CWSRF – Water or Energy Conservation or WaterFirst</td>
<td>0.50% (125 bp reduction)</td>
<td>0.50% (150 bp reduction)</td>
<td>0.52% (175 bp reduction)</td>
<td>1.03% (200 bp reduction)</td>
<td>$25,000,000</td>
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<tr>
<td>CWSRF - PlanFirst</td>
<td>0.50% (125 bp reduction)</td>
<td>0.50% (150 bp reduction)</td>
<td>0.77% (150 bp reduction)</td>
<td>1.53% (150 bp reduction)</td>
<td>$25,000,000</td>
</tr>
<tr>
<td>CWSRF – Land Conservation</td>
<td>0.50% (125 bp reduction)</td>
<td>0.50% (150 bp reduction)</td>
<td>0.52% (175 bp reduction)</td>
<td>1.03% (200 bp reduction)</td>
<td>$25,000,000</td>
</tr>
<tr>
<td>Drinking Water State Revolving Fund (DWSRF)</td>
<td>0.50% (100 bp reduction)</td>
<td>0.52% (100 bp reduction)</td>
<td>1.27% (100 bp reduction)</td>
<td>2.03% (100 bp reduction)</td>
<td>$25,000,000</td>
</tr>
<tr>
<td>DWSRF – Water or Energy Conservation or WaterFirst</td>
<td>0.50% (125 bp reduction)</td>
<td>0.50% (150 bp reduction)</td>
<td>0.52% (175 bp reduction)</td>
<td>1.03% (200 bp reduction)</td>
<td>$25,000,000</td>
</tr>
<tr>
<td>DWSRF – PlanFirst</td>
<td>0.50% (125 bp reduction)</td>
<td>0.50% (150 bp reduction)</td>
<td>0.77% (150 bp reduction)</td>
<td>1.53% (150 bp reduction)</td>
<td>$25,000,000</td>
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<tr>
<td>Water Supply Planning Loan</td>
<td>0.76%</td>
<td>1.52%</td>
<td>N/A</td>
<td>N/A</td>
<td>$3,000,000</td>
</tr>
</tbody>
</table>

**0.5% Interest Rate Floor  
Effective June 2014**
Energy Resources Division

• Georgia Energy Challenge
• Weatherization
• State Energy Program
• State Utilities Program
• Energy Assurance
• State Energy Strategy
• Performance Contracting
Energy Performance Contracting

What is Energy Performance Contracting?

• One company (Energy Service Provider [ESP] or Energy Service Company [ESCO]) evaluating, designing, installing and operating Energy Conservation Measures (ECMs) with guaranteed performance. Annual Measurement and Verification is conducted to confirm operation at guaranteed levels.

• Guaranteed savings in Utility Spend covers contracted costs (Debt Service, Maintenance and Measurement and Verification [M&V]).
Energy Performance Contracting

Energy Service Provider [ESP] or Energy Service Company [ESCO]

<table>
<thead>
<tr>
<th>GEFA Prequalified Energy Service Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABM</td>
</tr>
<tr>
<td>AMERESCO</td>
</tr>
<tr>
<td>Constellation Energy</td>
</tr>
<tr>
<td>Honeywell</td>
</tr>
<tr>
<td>McKinstry</td>
</tr>
<tr>
<td>NORESCO</td>
</tr>
<tr>
<td>PEPCO</td>
</tr>
<tr>
<td>Siemens</td>
</tr>
</tbody>
</table>
Utility Expenses

- Guaranteed Savings
- Contracted Costs

- Utilities & Maintenance
- Installment Purchase Payments
- Measurement & Verification
- Service
- Training
Expenses and Funding Sources

TYPES OF EXPENSES PAID BY PURCHASER

PROCUREMENT & BEFORE CONSTRUCTION
- Consultant (Optional)

DURING CONSTRUCTION
FROM FINANCING*
- Audit Fee
- Closing Costs
- Escrow Costs
- Commissioning
- Contingency
- Monthly Construction Progress Payments to ESP

AFTER CONSTRUCTION
FROM GUARANTEE
- Debt Service Payment
- Measurement & Verification
- Service Agreement
- Training
## Contract Costs - Construction

<table>
<thead>
<tr>
<th>Costs</th>
<th>Comments</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hard Costs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Furnish &amp; Install ECM</td>
<td></td>
<td>$2,704,209</td>
</tr>
<tr>
<td>ESP Contingency</td>
<td>4% contingency</td>
<td>$108,168</td>
</tr>
<tr>
<td><em>(A) Total Hard Costs</em></td>
<td></td>
<td>$2,812,377</td>
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<tr>
<td><strong>Financed Service Fees</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering, designs &amp; specs</td>
<td></td>
<td>$77,000</td>
</tr>
<tr>
<td>Project Management</td>
<td></td>
<td>$458,399</td>
</tr>
<tr>
<td>Commissioning</td>
<td></td>
<td>$46,071</td>
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<tr>
<td>Cost of Guarantee Security Instrument</td>
<td></td>
<td>$9,000</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>$210,655</td>
</tr>
<tr>
<td><em>(B) Total Financed Service Fees</em></td>
<td></td>
<td>$801,125</td>
</tr>
<tr>
<td><em>(C) Total Direct Costs (A + B)</em></td>
<td></td>
<td>$3,613,502</td>
</tr>
<tr>
<td><em>(D) Total Markup, Overhead &amp; Profit</em></td>
<td></td>
<td>$859,961</td>
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<tr>
<td><em>(E) Total Project Costs (C + D)</em></td>
<td></td>
<td>$4,473,463</td>
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<tr>
<td><strong>Agency Costs</strong></td>
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<tr>
<td>Agency Contingency</td>
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<td>$0</td>
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<tr>
<td>Investment Grade Audit Fee</td>
<td></td>
<td>$52,650</td>
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<tr>
<td>Agency Total Financed Costs</td>
<td></td>
<td>$52,650</td>
</tr>
<tr>
<td><strong>Incentive(s)/Rebates</strong></td>
<td></td>
<td>$(28,431)</td>
</tr>
<tr>
<td><strong>Total Financed Project Costs</strong></td>
<td></td>
<td>$4,497,682</td>
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</table>
## Sample Annual Cash Flow

<table>
<thead>
<tr>
<th>Year</th>
<th>Utility Savings</th>
<th>Operational Saving</th>
<th>Total Projected Savings</th>
<th>Total Guaranteed Savings</th>
<th>ECM Continuing M&amp;V</th>
<th>ECM Continuing Services</th>
<th>ECM Continuing Services (Training)</th>
<th>Installment Purchase Payments</th>
<th>Total Cost</th>
<th>Net Cash Flow</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>$516,072</td>
<td>$18,275</td>
<td>$534,347</td>
<td>$448,549</td>
<td>$39,206</td>
<td>$36,196</td>
<td>$2,366</td>
<td>$367,810</td>
<td>$448,548</td>
<td>$1</td>
</tr>
<tr>
<td>2</td>
<td>$523,819</td>
<td>$18,548</td>
<td>$542,367</td>
<td>$452,262</td>
<td>$41,526</td>
<td>$37,281</td>
<td>$2,437</td>
<td>$367,810</td>
<td>$449,054</td>
<td>$3,208</td>
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<tr>
<td>3</td>
<td>$531,676</td>
<td>$18,827</td>
<td>$550,503</td>
<td>$459,046</td>
<td>$42,772</td>
<td>$38,400</td>
<td>$2,510</td>
<td>$367,810</td>
<td>$451,492</td>
<td>$7,554</td>
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<td>12</td>
<td>$607,913</td>
<td>$15,434</td>
<td>$623,347</td>
<td>$518,776</td>
<td>$55,808</td>
<td>$50,103</td>
<td>$3,276</td>
<td>$367,810</td>
<td>$476,997</td>
<td>$41,779</td>
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<tr>
<td>13</td>
<td>$617,031</td>
<td>$15,665</td>
<td>$632,696</td>
<td>$526,558</td>
<td>$57,482</td>
<td>$51,606</td>
<td>$3,374</td>
<td>$367,810</td>
<td>$480,272</td>
<td>$46,286</td>
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<tr>
<td>15</td>
<td>$635,681</td>
<td>$16,139</td>
<td>$651,820</td>
<td>$542,473</td>
<td>$60,983</td>
<td>$54,749</td>
<td>$3,579</td>
<td>$367,810</td>
<td>$487,121</td>
<td>$55,352</td>
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<tr>
<td>Total</td>
<td>$8,609,273</td>
<td>$239,773</td>
<td>$8,849,046</td>
<td>$7,368,120</td>
<td>$748,735</td>
<td>$673,198</td>
<td>$44,012</td>
<td>$5,517,148</td>
<td>$6,983,093</td>
<td>$385,027</td>
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**ESP PROJECTIONS**

**ESP GUARANTEE**

**CONTRACTED EXPENSES**

*INVESTING IN GEORGIA’S ENERGY, LAND & WATER RESOURCES*
$87.4 Million Total Contract Value Authority for FY2015
Four Agencies and Two Authorities; Seven Projects

<table>
<thead>
<tr>
<th>Governmental Unit</th>
<th>Contract Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Georgia Mountains Authority</td>
<td>$5.1 Million</td>
</tr>
<tr>
<td>Georgia World Congress Center Authority</td>
<td>$28.1 Million</td>
</tr>
<tr>
<td>Department of Corrections</td>
<td>$28.6 Million</td>
</tr>
<tr>
<td>Board of Regents:</td>
<td></td>
</tr>
<tr>
<td>UGA Athens</td>
<td>$10.2 Million</td>
</tr>
<tr>
<td>GIT</td>
<td></td>
</tr>
<tr>
<td>Department of Transportation</td>
<td>$12.3 Million</td>
</tr>
<tr>
<td>Department of Juvenile Justice</td>
<td>$3.1 Million</td>
</tr>
</tbody>
</table>
When do you want to use Energy Performance Contracting?

- No budget for self funded work – No rate payer impact
- Limited experience with engineering systems
- Needs that require bundling to make project feasible
- Curious about what is possible for buildings
- Need to document utility savings
Benefits

- Contractually guaranteed & measured savings
- Integrated project analysis, design, and construction
- Long term monitoring of savings and performance
- Up-to-date training for facility operating personnel
- Services and materials based upon quality and life cycle value, rather than on lowest first cost
- Single point of responsibility for performance
How to get started?

• Contact Energy Service Providers
• GEFA Prequalified ESPs
  https://georgiaenvironmentalfinanceauthority.quickbase.com/db/bi42hbjwm?a=td
• Use Consultant familiar with Energy Performance Contracting
• Contact GEFA (Questions, template documents)
  https://georgiaenvironmentalfinanceauthority.quickbase.com/db/bi7e7gpwt?a=td
Chris White, P.E.
State Utilities Program Manager, Energy Resources Division
(404) 584-1089
cwhite@gefa.ga.gov

233 Peachtree St., NE
Harris Tower, Suite 900
Atlanta, Georgia 30303
Questions?

Please submit them in the question box of the GoToWebinar taskbar.
Thank you for joining us!