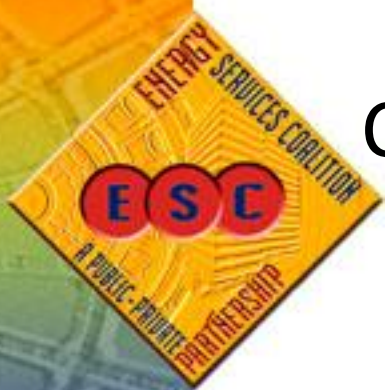
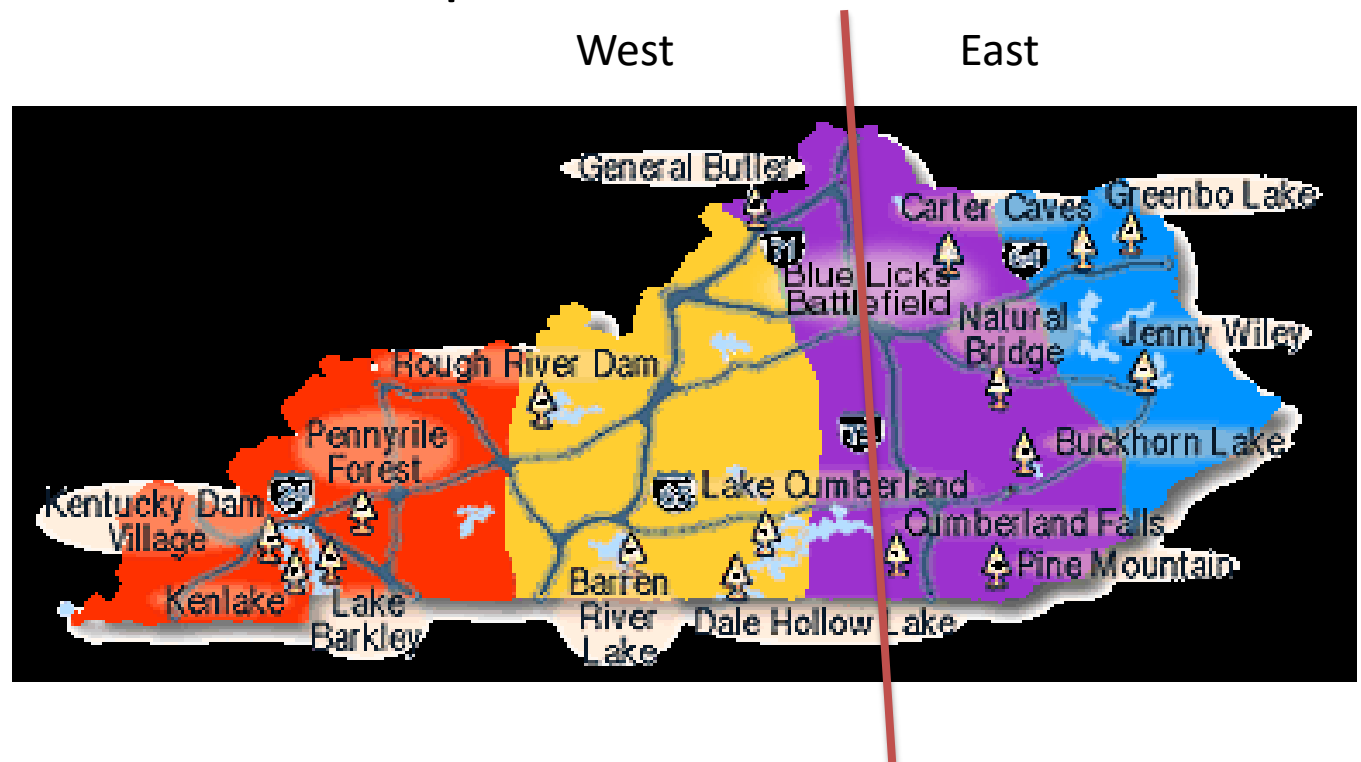


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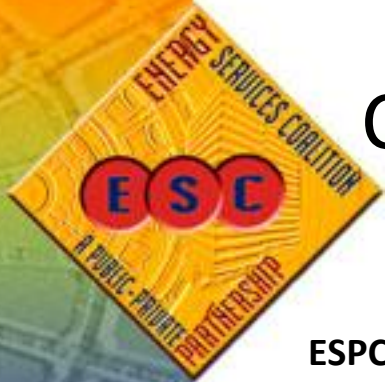


ESPC at the Department of Parks



What Success Looks Like

Commonwealth of KY Dept. of Parks



ESPC Legislation

KRS 56.770 -56.784

200 KAR 5:350

Guaranteed Energy Savings Performance Contract definition by statute: an agreement for the provision of energy services or equipment, including energy efficiency measures, energy conservation measures and alternate energy technologies for state government buildings, in which a person agrees to design, construct, install, maintain, operate or manage energy systems or equipment to improve energy efficiency of, or produce energy in connection with, a state government building. Payment for a guaranteed energy savings performance contract shall be made from measured and verified savings generated from implementation of the energy efficiency measures financed by the contract. The term of a guaranteed energy savings performance contract shall not exceed the life of the energy savings generated from implementation of the energy efficiency measures financed by the contract. If the measured and verified savings are not sufficient to pay the financial obligations under the contract, the contractor is liable for the contract payments.

What Success Looks Like

Commonwealth of KY Dept. of Parks



How do we procure ESPC projects for KY state agencies?

- » Competitive Negotiations (45A.085)
- » RFP- Request for Proposals
- » Selection Committee
 1. Selection Committee reviews proposals and shortlists to three ESCO's
 2. Selection Committee invites "the three" for oral interviews
 3. Selection Committee selects the ESCO to begin an (IGA) audit for the project

What Success Looks Like Commonwealth of KY Dept. of Parks



How do we procure ESC projects for KY state agencies?

» What does the Selection Committee Evaluate?

RFP response (written)

1. Project Management
2. Technical Approach
3. Financial Approach
4. Legal Approach
5. Existing Workload vs Capacity

Oral Presentation

1. Project Management Team
2. Response to Selection Committee Questions
3. Oral Presentation

» At the end of the Oral Presentation an ESCO is **selected** to begin the audit phase. NO Contract is awarded.

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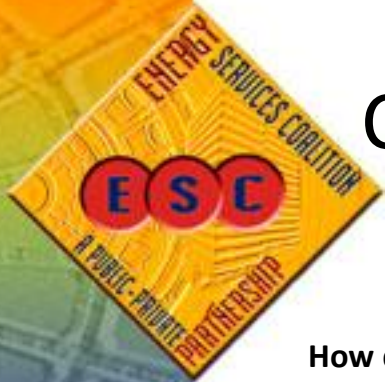
How do we develop an ESPC project for KY state agencies?

» Project Phases

- » **Phase A**-Technical Energy Audit and Project Development. The highest evaluated ESCO will
- » perform a Technical Energy Audit and develop the scope of the Guaranteed Energy Savings Performance
- » project. At the end of this Phase the ESCO will report their findings and make a recommendation for the
- » scope of the project. The Owner will select the work to be done. Cost and payback information will only be
- » estimated values and used to aid in the selection of work to be done. If an acceptable technical energy audit
- » and project has not been developed within 75 days from the date of ESCO selection, negotiations with the
- » next-ranked ESCO may be initiated. The cost for this Technical Energy Audit will not be reimbursed in the
- » event a contract cannot be agreed on.

- » **Phase B**-Advanced Project Development. This phase of the work is where the ESCO further investigates
- » the work selected by the Owner and completes the cost analysis in detail. As part of Advanced Project
- » Development (Phase B) the ESCO shall solicit multiple competitive bids for each Energy Conservation
- » Measurement (ECM) proposed. A copy of the solicitation and bids for each ECM shall be submitted to the
- » Division of Facility Efficiency prior to contract award. This shall include quotes for equipment, fixtures,
- » installation, and design, as applicable to each energy conservation measure proposed. The information at
- » this point will be detailed enough that a contract can be developed. Failure to complete this phase within a
- » mutually agreed upon duration shall be terms for canceling further negotiations with the ESCO selected for
- » the project. Prior to Phase C, the FAC shall administer the procurement for financing the project on behalf of
- » the Using Agency. FAC will obtain a rate lock for the project to be used in the final cash flow for the project.
- » The rate lock is available for sixty (60) days.

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How do we develop an ESPC project for KY state agencies?

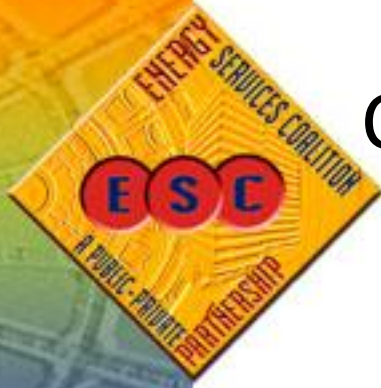
» Project Phases

- » **Phase C**-Development of Guaranteed Energy Savings Performance Contract. Following
- » successful completion of the technical energy audit, Owner intends to negotiate a performance contract to
- » implement the project. Owner has the option to decline any or all performance contract agreements. The
- » ESCO will complete working drawings, and develop a detailed project schedule including construction time.
- » These will be submitted to the Using Agency and Division of Facility Efficiency for approval. The
- » ESCO will submit a complete set of contract exhibits/Office of Financial Management (OFM) review
- » documents within fifteen (15) days for the date the rate lock was obtained in Phase B.

- » **Phase D**-Project Implementation. Actual contracted work is being done and monitored by the
- » ESCO, Using Agency and Division of Facility Efficiency. Project meetings for the duration of the
- » construction period will be conducted by the ESCO.

- » **Post Phase D**- Measurement and Verification. Savings are verified. Payments are disbursed
- » per the terms of the contract. When the Using Agency and FAC has determined it is in the best interest of the
- » Commonwealth, the Commonwealth Energy Management and Controls System (CEMCS) may be used as
- » an alternative method for measurement and verification (M&V). This may be used in lieu of third party M&V or
- » M&V provided by the ESCO. Utilization of CEMCS M&V does shall not affect the requirement of the ESCO to
- » guarantee the savings for the term of the contract.

What Success Looks Like Commonwealth of KY Dept. of Parks



ESPC at the Department of Parks

West (508 buildings)

Barren River State Resort Park
Dale Hollow State Resort Park
General Butler State Resort Park
Kenlake State Resort Park
KY Dam Village State Resort Park
Lake Barkley State Resort Park
Lake Cumberland State Resort Park
Pennyrile Forest State Resort Park
Rough River State Resort Park

East (473 buildings)

Buckhorn Lake State Resort Park
Blue Licks Battlefield State Resort Park
Carter Caves State Resort Park
Cumberland Falls State Resort Park
Fort Boonesborough State Park *
Greenbo Lake State Resort Park
Jenny Wiley State Resort Park
Levi Jackson State Park *
Natural Bridge State Resort Park
Pine Mountain State Resort Park

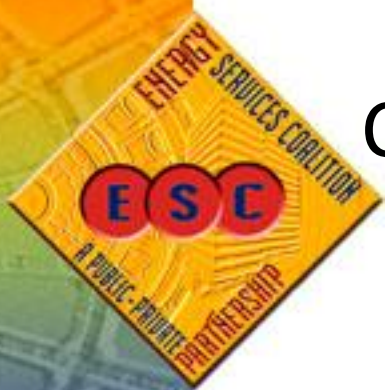
What Success Looks Like Commonwealth of KY Dept. of Parks



Western KY Project

(first annual M&V report indicated an excess savings, beyond the guarantee, of \$110,762 (11%))

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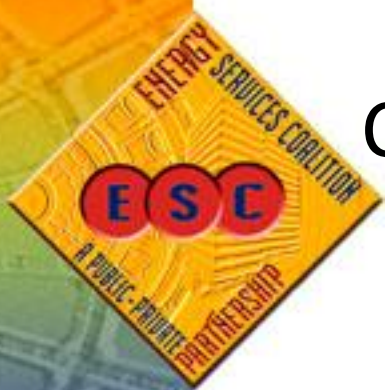
Eastern KY Project

What Success Looks Like Commonwealth of KY Dept. of Parks



- **Scope of Work for West KY DOP:**
-
- ***Lighting**
- Interior Lighting: – **All Parks**
- Exterior Lighting: – **All Parks**
- Lighting Controls: Lighting motion sensors installed in restrooms, offices, closets, etc. – **All Parks**
- New daylight harvesting lighting control systems installed. – **Barren River, Dale Hollow, General Butler, KY Dam Village, and Pennyrile.**
- Occupancy controls installed on all vending machines. – **All Parks**
- ***Water Efficiency Upgrades**
- - **All Parks**
- ***Laundry Ozone**
- Laundry ozone systems installed and reprogramming of existing washers. – **Barren River, KY Dam Village, Lake Barkley, Lake Cumberland, Rough River**
- ***Laundry Systems Upgrades**
- Installed 2 high efficiency front load washers and 2 high efficiency dryers at each of the 2 parks. – **Kenlake, Lake Barkley**
- ***Pool Ozone Treatment Systems**
- Installed pool ozone treatment systems on outdoor pools. – **Barren River, Rough River.**
- ***Ice Machine Retrofits and Replacements**
- Installed new counter flow heat exchanger energy recovery systems to existing air cooled ice machines. – **All Parks**
- Replaced existing water cooled ice machines with new air cooled machines with counter flow heat exchanger energy recovery systems. – **All Parks**
- ***Liquid Pool Cover**
- Installed new liquid pool cover systems on indoor pools minimize evaporation. – **Lake Barkley, Lake Cumberland**
- ***Install Pool Liner**
- Replaced the pool liner to stop leaks. – **KY Dam Village**
- ***Trash Compactors**
- Installed new stationary trash compactors to replace the existing 40 yard open containers at each of the 3 parks. – **Dale Hollow, Lake Barkley, KY Dam Village**
- ***Hot Water Piping Insulation**
- Installed new plumbing and heating system hot water piping insulation. – **All Parks**
-

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- Scope of Work for West KY DOP continued:

- *Bath House Solar Photovoltaic Hot Water System

- Installed a roof mounted solar photovoltaic system and air to water heat pumps. The new PV system will be used to power the new air to water heat pumps during periods when there is sufficient hot water demand and will feed solar PV power back into the Resorts electrical grid during low hot water demand periods. – **Barren River, Dale Hollow, KY Dam Village**

- *Sewer System Upgrades

- Repaired sewer system to alleviate the existing inflow and infiltration. – **General Butler**

- *HVAC Upgrades

- New split systems installed in cottages and residences. – **All Parks**

- Replaced lodge room PTACs. – **Dale Hollow, General Butler, Barren River, Lake Cumberland, Rough River**

- Replaced an older inefficient electric hot water heater in the laundry facility. – **Barren River**

- Replaced air cooled chiller with new air cooled chiller. – **Barren River**

- Replaced 2 inefficient chillers with 2 new chillers and new pumps and installed a new motor and VFD on the cooling tower. – **KY Dam**

- **Village**

- Installed 2 new natural gas boilers. – **General Butler**

- Installed 2 new propane boilers to serve the main lodge. – **Rough River**

- Installed 1 new propane boiler to serve the main lodge. – **Lake Cumberland**

- Installed a new natural gas hot water heating system with an integrated supplemental solar thermal system with roof top mounted solar panels. – **Kenlake**

- Installed a new geothermal heat pump system and reworked the existing HVAC air distribution ductwork at the Tennis Center. – **Kenlake**

- Installed a new ground mounted solar thermal system that was tied into the existing pool water heating system. – **Lake Barkley**

- *Controls

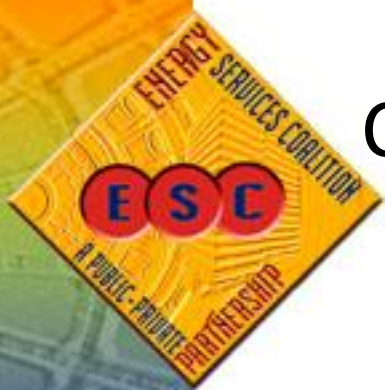
- Installed new CO2 based ventilation controls. – **All Parks**

- Upgraded existing DDC control systems. – **Barren River, Dale Hollow, Kenlake, Rough River**

- Installed new DDC control systems. – **General Butler, KY Dam Village, Lake Barkley, Lake Cumberland, Pennyriple**

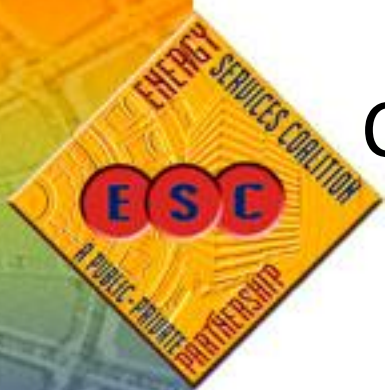
- Installation of a Guest Energy Management System in cottages, residences, and lodge rooms that utilizes occupancy sensors to activate the HVAC systems. – **All Parks**

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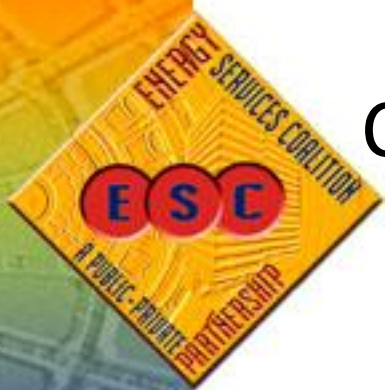
- **Scope of Work for East KY DOP:**
- ***Lighting**
- Interior Lighting: All T12 fixtures were replaced with LED's. All incandescent lamps were replaced with 18 watt CFL's. Existing T8 and CFL lamps that have over 5000 burn hours were retrofitted with LED lamps. All existing heat lamps were replaced with CFL bulbs. Existing CFL lamps remained in place. **All Parks**
- Exterior Lighting: Metal halide, high pressure sodium, and incandescent flood lights were replaced with LED lamps and fixtures. **All Parks**
- Occupancy sensors were installed in convention centers, meeting rooms, dining spaces, offices, closets, and restrooms. Occupancy controls were installed on vending machines. All malfunctioning photocells were replaced with new. **All Parks**
- ***Building Envelope Improvements**
- All exterior doors were weather stripped. **All Parks**
- Existing HVAC openings for PTAC units, piping, ductwork, and louvers were sealed to minimize infiltration. **All Parks**
- Duct penetrations, open voids, holes, penetrations will be sealed. Insulation repaired and installed. **Carter Caves, Natural Bridge, Fort Boonesborough.**
- Existing cabins will be caulked and chinked. **Pine Mountain**
- ***Laundry Ozone**
- All parks except Levi Jackson and Fort Boonesborough received one ArtiClean ozone laundry system.
- ***Water Efficiency Upgrades**
- All parks lodge rooms received 2.0 gpm showerheads. All faucet aerators replaced with 1.0 gpm aerators. All bathhouse and pool showerheads replaced with 1.5 gpm vandal resistant heads. All common guest area toilets replaced with 1.5 gallons per flush fixtures. All existing urinals replaced with .125 gallons per flush urinals. Individual lodge room toilets were not replaced. **All Parks**
- ***Utility Infrastructure Changes**
- **Jenny Wiley** – A new single phase electrical service was installed, redundant site lights removed, and select high wattage site lights replaced with LED.
- **Fort Boonesborough** – A new primary electrical feed was extended from the campground switchgear to the existing overhead service feeding the fort.
- ***Utility Sales Tax Avoidance**
- Sales tax was removed from 4 utility meter accounts. **Buckhorn, Carter Caves, and Pine Mountain**
- ***Utility Rate Tariff Optimization**
- Utility rate changes. **Fort Boonesborough, Jenny Wiley, and Pine Mountain**
- ***Seasonal Facility Winterization Capabilities**
- Bathhouses – **Blue Licks, Fort Boonesborough**
- Reroute water piping from unconditioned attic space to conditioned area to prevent heating of uninsulated attic space – **Carter Caves**

What Success Looks Like Commonwealth of KY Dept. of Parks



- **Scope of Work for East KY DOP continued:**
- ***Natural Gas Dryers**
 - Replaced 3 existing electric dryers with natural gas dryers – **Jenny Wiley**
- ***Re-sod Fairways with Warm Season Bermuda Grass**
 - Wasioto Winds golf club fairways sprigged with Northbridge Bermuda. – **Pine Mountain**
- ***Kitchen Equipment Upgrades**
 - Replaced several walk-in cooler, freezer refrigeration units, and walk-in cooler and freezer boxes. – **Greenbo, Blue Licks, Carter Caves, Jenny Wiley**
- ***Wastewater Treatment Plant Upgrades**
 - Reduce potable water usage and electricity usage. - **Carter Caves, Cumberland Falls**
- ***Pool Leak Repairs**
 - **Blue Licks, Fort Boonesborough, Carter Caves, Jenny Wiley, Levi Jackson, Natural Bridge.**
- ***Pool Mechanical Room Upgrades**
 - New pumps, basket strainers, VFDs, flow meters, programmable controller, reduced pressure backflow preventer, and pipe hangers. - **Fort Boonesborough, Greenbo**
- ***Water Heater Upgrades**
 - Commercial water heaters over 10 years old were replaced. – **Greenbo, Blue Licks, Jenny Wiley, Carter Caves, Natural Bridge, Levi Jackson**
- ***Domestic Water Leak Repairs**
 - Replace galvanized branch lines with PVC piping and replace water hydrants in campground. – **Levi Jackson**

What Success Looks Like Commonwealth of KY Dept. of Parks



- Scope of Work for East KY DOP continued:
- *HVAC Upgrades
- New ground source Geothermal system installed. Lodge split systems replaced with geothermal water source heat pumps. Lodge PTACS replaced with new console geothermal water source heat pumps. Lodge room domestic hot water will be provided by new geothermal heat pump water heaters. - **Blue Licks, Carter Caves, Cumberland Falls**
- New kitchen make up air units installed. - **Blue Licks, Cumberland Falls, Greenbo, Natural Bridge**
- Installed 2 new unit ventilators to provide make up air for the kitchen exhaust as well as 2 new geothermal water source heat pumps to provide conditioned air to the kitchen. - **Carter Caves**
- New lake source Geothermal system installed. Replaced all lodge split systems and existing water source heat pumps with new geothermal water source heat pumps. Lodge domestic hot water provided by new geothermal heat pump water heater. - **Greenbo**
- Replaced the existing air cooled chiller with Geothermal water to water heat pumps. - **Cumberland Falls**
- New hybrid Geothermal system installed, new chiller installed, 2 pipe fan coil units replaced with new in lodge rooms, installed new geothermal domestic hot water heater, and a new water to water hot and chilled water plant was installed. - **Natural Bridge**
- 2 new high efficiency condensing boilers, new water source heat pumps, new pumps, replaced PTAC heat pump units in the lodge rooms with hot water coils. Replaced the convention center boiler. - **Jenny Wiley**
- Split systems 14 years or older replaced, PTACs 10 years or older replaced with new. - **All Parks**
- *Controls
- Lodge rooms provided with occupancy based controls, meeting rooms provided with demand controls, and a new web based DDC control system installed to control, adjust, and schedule HVAC systems and domestic water systems. - **All Parks except Levi Jackson and Fort Boonesborough**
- Outlying buildings that are not part of the lodge DDC control systems will be provided with stand alone occupancy based controls. - **All Parks**
-

What Success Looks Like Commonwealth of KY Dept. of Parks



- **How are the West and East projects the same /different.**

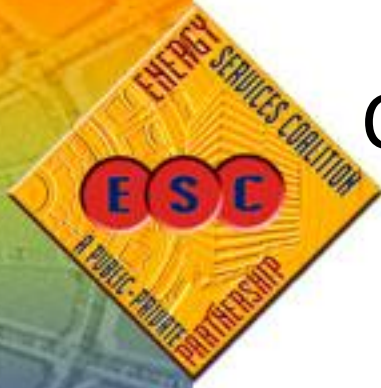
Consistencies with both projects include improvements for : lighting, building envelope improvements, laundry, water/sewer conservation, Guest Energy Management Systems, DDC controls, HVAC equipment, pool repairs, kitchen equipment,

Key Differences between the two projects:

- The west project replaced all toilets with new china. The east project only replaced toilets with new china in common areas with high usage.
- In the east project, we went with higher flow showerheads and aerators due to customer complaints in the west. (lesson learned)
- The east project allowed for more LEDs to be utilized than the west project due to lower cost and higher number of warranty years.
- The east project installed 5 geothermal systems for the main lodges. In the west we installed one geothermal system at the Kenlake tennis center.
- No solar installations were included in the east due to the wooded settings of the lodges. In the west we installed solar at Lake Barkley, Kenlake, Barren River, Dale Hollow and KY Dam Village.
- The east project included more pool repairs than the west.
- 2 different DDC and energy management systems were utilized for the 2 projects.
- The east project had more kitchen equipment upgrades than the west.
- The east project provided for utility infrastructure and utility rate changes. The west project did not.
- The west project included many ice machine upgrades and replacements. The east project did not.
- The east project included replacing the fairways grass with warm season Bermuda grass at Pine Mountain.
- The west project installed trash compactors. The east project did not.
- The east project provided for all the parks to be integrated into the CEMCS (Commonwealth Energy Management Controls System)

What Success Looks Like

Commonwealth of KY Dept. of Parks



- **DOP ESPC Summary from statewide implementation.**
- **Total cost for implementation** **\$25.3 million**
- **Guaranteed Annual Energy Savings** **\$2 million**
- **Utility Rebates** **\$763,000**
- **981 buildings included statewide**