

Kentucky Community and Technical College System ESPC Initiative

Energy Services Coalition Conference
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OVERVIEW



- KCTCS Background
- Process
- Garnering Buy-in
- Implementation, Tracking and Reporting
- Project Success

KCTCS PROFILE

- Created in 1997
- 16 colleges; more than 70 campuses/locations
- KY's largest provider of postsecondary education
 - 700+ credit program options
 - 116,614 credit-seeking students attended KCTCS in academic year 2014-15
 - 30,012 Credentials awarded
 - 12,965 dual credit and dual enrollment
 - 60,024 online students
 - Part-time students: 60%
 - Full-time students: 40%
 - Community/Economic Development Participants
 - 11,285 Adult Education enrollments
 - 19,648 Community Education enrollments
 - 39,549 Workforce Solutions enrollments
 - 112,629 Fire and Rescue enrollments



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KCTCS PHYSICAL PLANT



KCTCS infrastructure totals 8.7 million gross square feet:

- KCTCS-owned space
 - Totals approximately 7.7 million gross square feet
 - Education and program space owned comprises approximately 7.5 million square feet in 358 buildings
- KCTCS free or leased space
 - Totals approximately 1.0 million gross square feet in 298 buildings
 - Education and program space free or leased comprises approximately 0.5 million square feet

KCTCS PHYSICAL PLANT



Since inception in 1997, authorization received for 45 new state funded construction projects or major renovation projects, totaling approximately \$500 million

- 33 projects completed between 1998 and 2008, having approximate total scope of \$276 million
- 11 projects completed during the 2008-10 biennium, having approximate total scope of \$200 million
- 1 project completed in the 2012-14 biennium

DEFINITION

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Social Criteria:

Socially desirable (equitable)

Psychologically nurturing

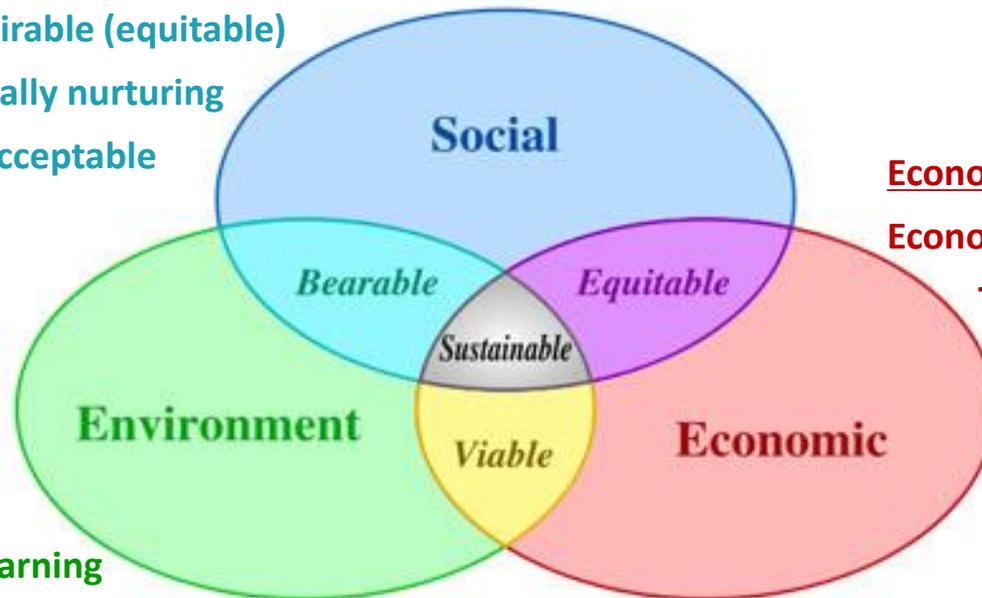
Culturally acceptable

Environmental Criteria

Environmentally robust

Generationally sensitive

Capable of continuous learning



Economic Criteria

Economically sustainable

Technologically feasible

Operationally viable

Definition Source: *Our Common Future: Report of the World Commission on Environment and Development also known as the Brundtland Report*), United Nations, 1987.

Graphic Source: Johann Dréo and translated by User:Pro_bug_catcher, March 2006/ Translated January 2007 and Accessed October 21, 2010, at http://en.wikipedia.org/wiki/File:Sustainable_development.svg#file



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KCTCS GREEN+ SUSTAINABILITY OBJECTIVES

- **Promote sustainable communities inside and outside of KCTCS,** using an all-encompassing, no-silo, collaborative approach, through adoption of sustainable development goals
- Provide transformative education and training, equipping individuals with knowledge and tools to live and work in a global, green, knowledge-based economy
- Facilitate cultural change to balance the social, environmental, and economic criteria of the sustainability triple bottom line across KCTCS
- **Enhance the efficiency and effectiveness of KCTCS**
- **Protect Kentucky's natural resources and environment**
- Embrace and practice social justice across KCTCS
- **Benchmark progress toward sustainability using nationally recognized sustainability metrics**



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DRIVING FORCES

- **Economics**

- Sustainable economic development – **Green Jobs**
- Budget

- **Environment**

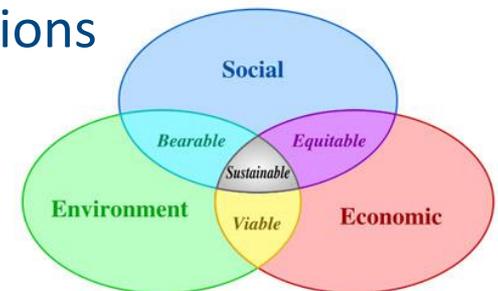
- Indoor
 - Air quality
 - Learning environment
 - Productive work environment
- Outdoor
 - Pollution
 - Landfill capacity
 - Ecological stewardship
 - Resource management

- **Energy**

- Electric utilities (rate structures)
- Limitation of nonrenewable energy
- Global energy demand

- **Stakeholders**

- Customers
- Vendors
- Government
- Future generations



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ENERGY SAVINGS PERFORMANCE CONTRACTING

KRS 56:770(6) defines an ESPC as:

"Guaranteed energy savings performance contract" means 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.



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KCTCS ENERGY SAVINGS PERFORMANCE CONTRACTING

- Second Kentucky postsecondary institution to engage ESPC initiatives (2004)
- KCTCS – Commonwealth of Kentucky partnership
- Legislative authority



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RELATED STATE STATUTES – SELECT EXAMPLES

| Area | Kentucky Revised Statute |
|-------------------|--|
| Energy Efficiency | KRS 56.770, KRS 56.777, KRS 56.782, KRS 164A.580, KRS 56.775, KRS 45A.615, KRS 45A.351, KRS 45A.352 |
| Energy | KRS 42.580 to KRS 42.588 and KRS 152.710 to 152.720 |
| Green Purchasing | KRS 45A.645, KRS 45A.500 to KRS 45A.540 |
| Pollution | KRS 224.46-305, KRS 224.46-310, KRS 224.46-315, KRS 224.46-320, KRS 224.46-325, KRS 224.46-330, KRS 224.46-335, KRS 224.46-510, KRS 224.46-520 |
| Recycling | KRS 224.10-650, KRS 224.10-660, KRS 224.10-620, KRS 45A.520, KRS 160.294, KRS 141.390 |
| Education | KRS 157.900, KRS 157.905, KRS 157.910, KRS 157.915 |

ESPC DECISION PROCESS

Step 1. State agency initiates project proposal (Projects may be identified through low-cost/no-cost program or ESCO contact)

Step 2. Department for Facilities Management initiates RFQ/RFP process (ESCOs conduct preliminary energy audit)

Step 3. Department for Facilities Management selects ESCO for project implementation (ESCO conducts detailed energy audit)

Step 4. Department for Facilities Management negotiates ESPC with ESCO (ESCO works with state agency to implement project)



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LESSON LEARNED

Educating budget officers and senior leadership:

- ESPC value
- ESPC vs Capital or Deferred Maintenance Budget
- Cost avoidance to retire debt service
- Reallocation of avoided costs to other budget areas



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IMPLEMENTATION, TRACKING AND REPORTING



- Energy Conservation Measures (ECM)
 - Technological advances
 - Utility rate increases
 - Evolving, CQI process that is not static

IMPLEMENTATION, TRACKING AND REPORTING



- Actual energy savings
- Return on Investment (ROI)
- Value from deferred maintenance projects

ENERGY SAVINGS PERFORMANCE CONTRACTING

KRS 56:770(6) mandates:

Payments 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;



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LESSON LEARNED

- Commissioning HVAC and Building automation Systems
 - Functionality does not ensure efficient functioning
 - Opportunities to increase efficiencies of the ECMs
 - Train/Troubleshoot malfunctions
 - Routine maintenance
 - General ECM functions
- Training staff and other end users



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KCTCS ENERGY SAVINGS PERFORMANCE CONTRACTING

Round 1: Five contracts, three energy savings companies

| Contract | ESPC Contract Groupings | Award Year | Payback Period or Contract Length | TOTAL Guaranteed Energy Savings over Payback Period |
|----------|--|------------|-----------------------------------|---|
| 1 | Jefferson Madisonville | 2004 | 13 years | \$2.7 million |
| 2 | Bluegrass Elizabethtown Owensboro | 2008 | 12 years | \$3.5 million |
| 3 | Bowling Green Henderson Hopkinsville West KY ^C | 2008 | 13 years | \$6.4 million |
| 4 | Hazard Somerset Southeast KY | 2010 | 14 years | \$9.2 million |
| 5 | Ashland Big Sandy Gateway Maysville | 2011 | 13 years | \$6.3 million |
| Totals | | | | \$28.1 million |

KCTCS ENERGY SAVINGS PERFORMANCE CONTRACTING

Round 2: Two contracts to date, two energy savings companies

| Contract | ESPC Contract Groupings | Award Year | Payback Period or Contract Length | TOTAL Guaranteed Energy Savings over Payback Period |
|----------|--|------------|-----------------------------------|---|
| 1 | Madisonville Owensboro West Kentucky | 2015 | 14 years | \$11.8 million |
| 2 | Ashland Bluegrass | 2016 | 14 years | \$9.9 million |
| | | | Totals | \$21.7 million |

KCTCS ENERGY SAVINGS PERFORMANCE CONTRACTING

- Emphasis shift
 - Round 1
 - Low hanging fruit, e.g., lighting
 - \$28M guaranteed savings
 - Payback achieved early
 - Round 2
 - Deferred maintenance, high-ticket items
 - Commonwealth Energy Management Control System (CEMCS)
 - Payback target 14 years
 - \$21.7M guaranteed savings



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KCTCS ESPC CEMCS MAJOR COMPONENTS

Four Major Components

- Utility Monitoring and Analysis
 - Monthly bill analysis, interval data, rate structure verification
- Building Automation Integration and Diagnostics
 - BAS output data in Sequel will be analyzed for sequence of operations
- Automated Utility Bill Paying (Centralized?)
 - Electronic Data Interchange (EDI) will be developed by Utility providers and fed into CEMCS for usage and payment
- Work Order Generation and Tracking
 - Each agency may have different CMMS
 - CEMCS attempts to notify designated contacts of issues that need attention



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BUILDING AUTOMATION INTEGRATION AND DIAGNOSTICS

- Integrates building heating, ventilation, air conditioning (HVAC) and lighting controls into a **agency preferred** operator interface that can be accessed from any web based browser
- Allows facility managers to make informed decisions about HVAC and lighting operations, including the ability to turn off systems when appropriate (unoccupied)
- Has built in diagnostics, to assist facility managers with troubleshooting all major energy users



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Commonwealth Energy Management and Control System



CEMCS



Home

Information

Buildings

Welcome to the Commonwealth Energy Management and Control System (CEMCS) energy dashboard, where you can view real-time energy and dollar savings in state-owned buildings. Utilizing an innovative energy management and control software system, CEMCS reduces energy usage by up to 40 percent, saving hundreds of thousands of dollars each year in utility costs. Currently the system is active at 23 sites across the state in this pilot phase. This website allows



Total Buildings
23



Square Footage
1,962,976



Total Occupants
7,104



Percentage Energy Savings

13.5%

On track to meet 2015 goal On track to meet 2025 goal

Compared to baseline year (2009), normalized for variations in weather.



Cumulative Dollar Savings

\$1,338,035

Compared to baseline year (2009), weather normalized.

Details



<http://kyenergydashboard.ky.gov/>

OPPORTUNITIES AND LESSONS LEARNED

*“Our chief usefulness to humanity rests on our combining power with high purpose.”
(Teddy Roosevelt)*



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KCTCS
GREEN +
INITIATIVE



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