

2006 Greening Virginia Colleges and Universities

Green Operations and Energy Management

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Agency Case Study: Virginia Community College System

- Established 1966
- 23 Colleges; 40 Campuses; 315 Facilities
- 93,300 FTE; 325,000 Headcount
- \$750M Op Budget
- \$315M Cap Budget



Agency Case Study: Virginia Community College System

■ Dateline 2009:

– *A Strategic Direction*

– Enrollment

40,000 new students by 2012;
New space a priority...

– Workforce Training

– Graduation, Retention,
Placement

...Comfort in old buildings
also a priority...

– 4-Year Transfer

– Affordable Tuition

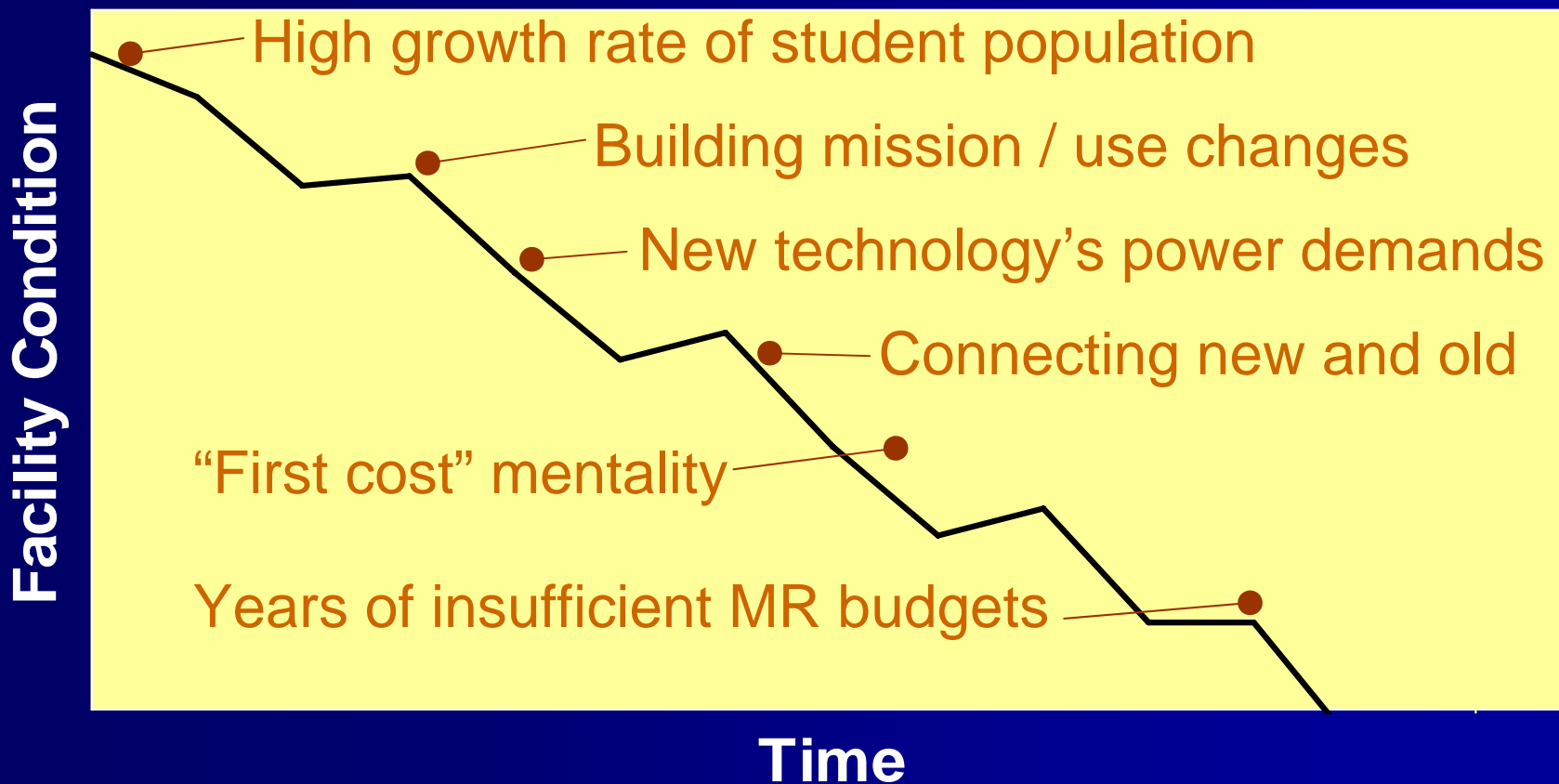
...Rising energy costs and
limited capital compound the
issue.

– Dual Enrollment with High
School

– Private Funding

Agency Case Study: Virginia Community College System

How the VCCCS Facilities Challenge was born...



Performance Contracting

Key Concepts

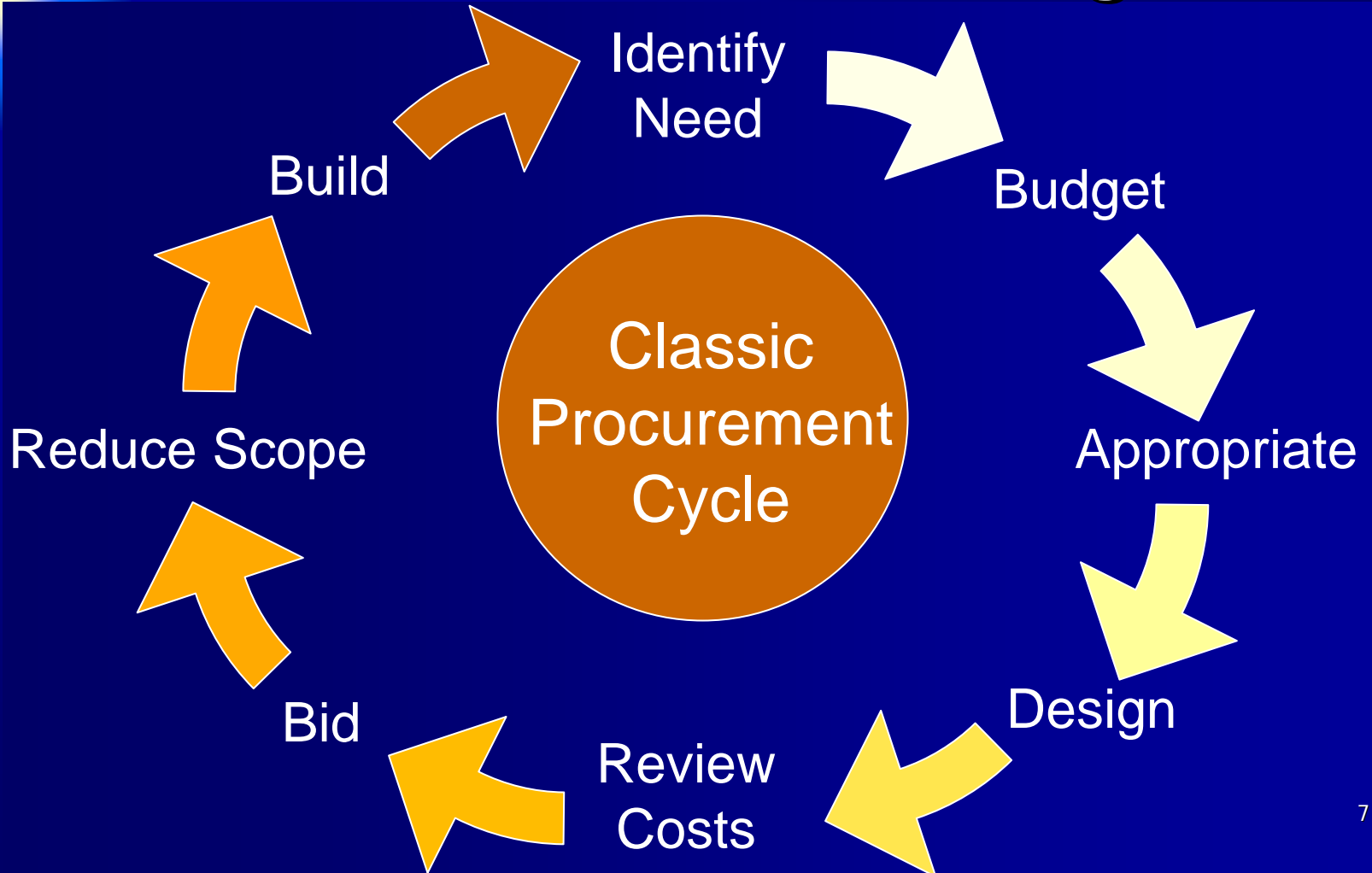
- Life cycle focus
- Not restricted to original budgets
- ESCO takes cost risk
- Fully commissioned facilities with guaranteed performance

Performance Contracting

Key Concepts cont'd

- Single source accountability
 - Design, Construction, Performance
- 15-Year partner with institutional knowledge of VCCS
- Customer satisfaction required to continue program!

VCCS Facilities Challenge



VCCS Facilities Challenge

Performance Metrics

Identify
Need

Budget

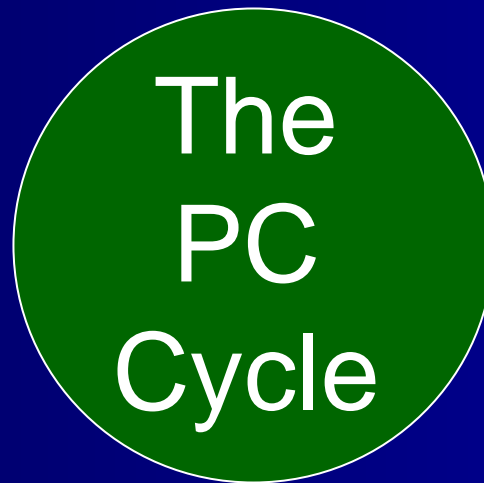
Appropriate

Change
Course

Campus Audit

Design /
Build

Commission



Facility Case Study: Wytheville Community College

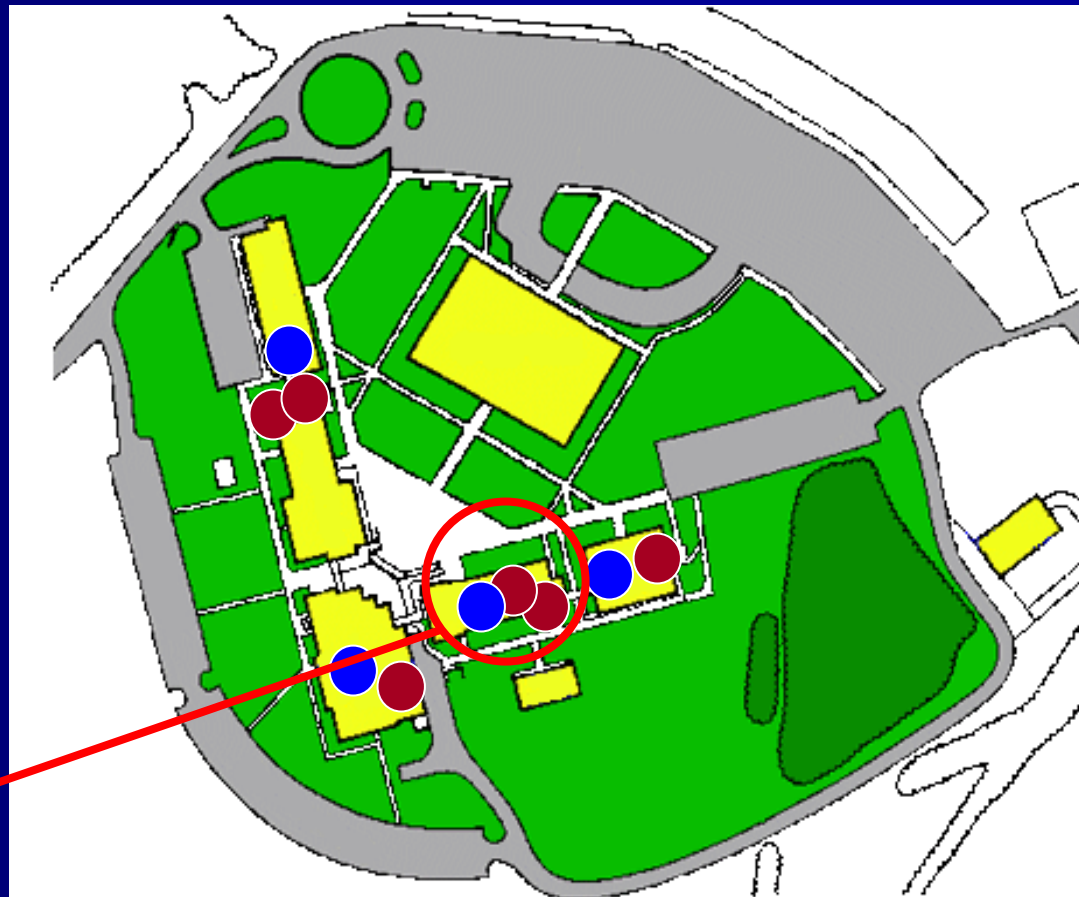


Facility Case Study: Wytheville Community College

\$2.7M Bond Funding

- Replace aged chillers and boilers
- Replace aged air-delivery system
- Update from pneumatic controls to DDC controls

Enough capital to complete 1 building...

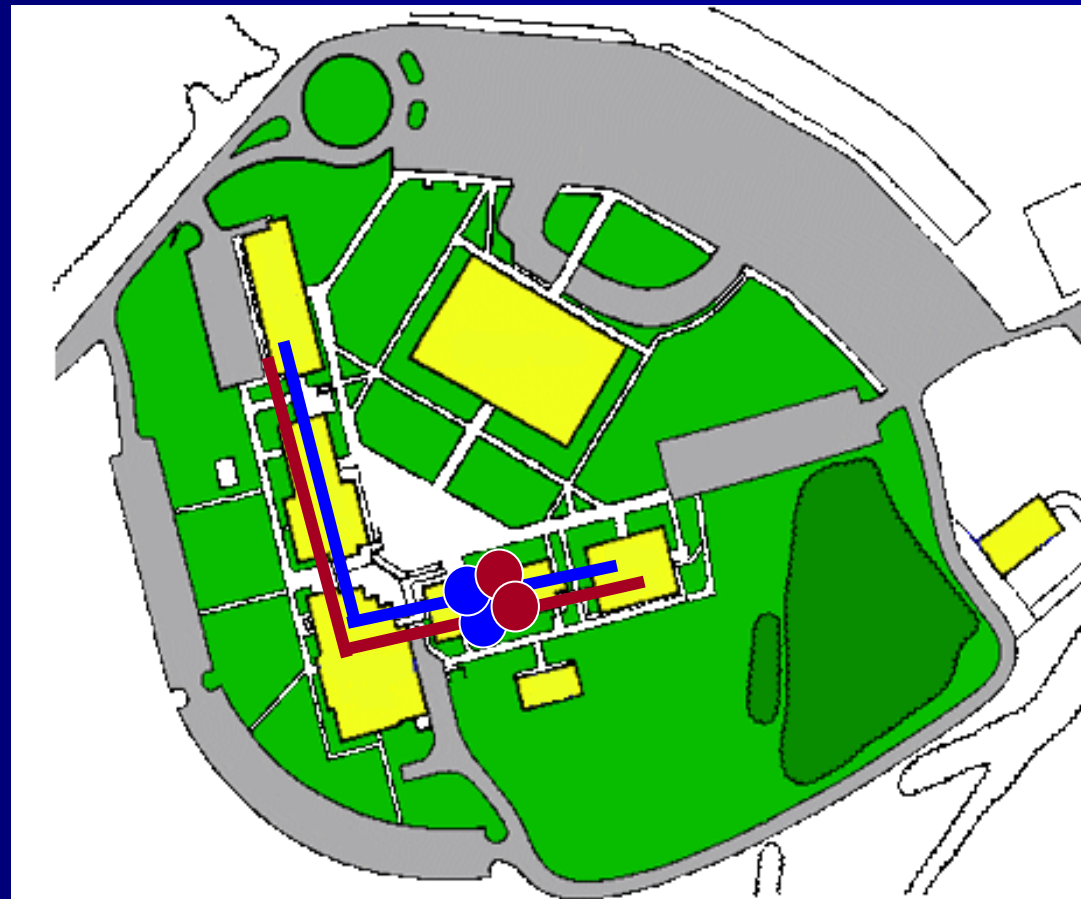


● Chiller ● Boiler

Facility Case Study: Wytheville Community College

SOLUTION

- Central Plant
- Eliminate 6 major pieces of equipment
- 4-pipe conversion
- New FCUs
- New DDC Controls



Facility Case Study: Wytheville Community College

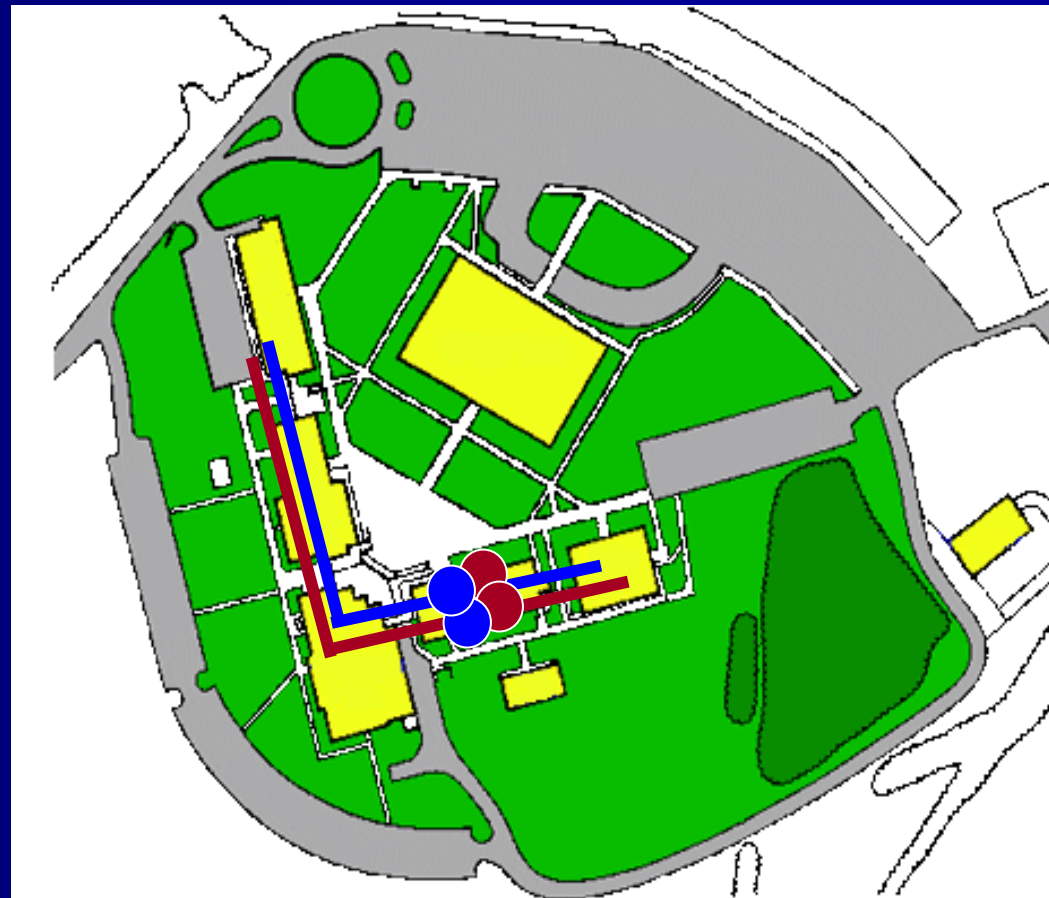
BENEFITS

- Major impact on indoor air quality in Fincastle
- Improved classroom comfort
- Reduced maintenance burden

**\$136,000 / yr
Savings (47%)**

\$4.5M Fully Funded

PC Project



AGENCY/OWNER ASPECTS

Energy Performance Contracting

- Implemented through EO 54 by Gov. Mark Warner
- Continued by Gov. Tim Kaine through EO 28
- Updated Program protocols anticipated Sept 30, 2006
- Agency approval by governing Board required to engage in PC process

AGENCY/OWNER ASPECTS

Energy Performance Contracting

Procurement

- In accordance with DGS C300020 – No RFP required
- Select 3 Energy Services Companies [ESCOs] for Back of Envelop phase
- The ESCO selection process is the time to consider Measurement & Verification! [M&V] What methodology does your preferred PC utilize? Commonwealth adheres to Federal Guidelines for M&V Option A, B, or C
- Back of Envelop audit results lead to interview process and selection of ESCO
- Implementation of MOU with Agency OAG approval

AGENCY/OWNER ASPECTS

Energy Performance Contracting

Project Development

- Not a low-bid process!
- Design Agent is Contractor
- Atypical – short on design docs, scope is generally the result of much discussion, formal energy analysis
- Holistic approach to buildings solutions
- No Change-Order process with Guaranteed Open Book Pricing [change orders occur at owner request of additional work]
- Once Project is developed and selected, DMME project approval required and CO-8 is simultaneously submitted to DPB/BCOM identifying funding strategy

Commonwealth Department of the Treasury

Vendor/Third Party Financings available through
Banc of America Leasing & Capital, LLC
or
First Municipal Credit Corporation

- **Treasury Board Approval:** Agencies are not required to use the Energy Leasing program. Alternative financing arrangements must first be approved by the Treasury Board.
- **Procurement Process:** Agencies must adhere to the State's procurement laws and regulations procuring financing arrangements.
- **Treasury Board Review:** Treasury Board review is limited to the financial terms and conditions of the arrangement.
- **Documents:** Agencies must provide Treasury Board with a copy of the final executed financing contract.

Bureau of Capital Outlay Management

BCOM

- One full review, Building Permit submittal, is required
- Process is streamlined – only CO-2, CO-8 required; see Ralph's General Guide to Submittal Forms
- CO-11 if requested Owner additional Work
- All codes still apply

Bureau of Capital Outlay Management

General Guide to Form Submittals

April 4, 2006

(See CPSM Chapter 14 for additional guidance.)

Non-Capital Projects subject to BCOM review	Capital Outlay Projects			Special Project Classes *				
	Traditional Des/Sid/Build	Construction Management	Design- Build	PPEA	HECO	HEMA	ESCO (g)	
							Capital Proj	Non-Cap Proj

Capital Outlay Approval Forms

Form ID	Description	Traditional Des/Sid/Build	Construction Management	Design- Build	PPEA	HECO	HEMA	ESCO (g) Capital Proj	ESCO (g) Non-Cap Proj
CO-2	Approval to Initiate Project	✓	✓	✓	✓	✓ (c)	✓ (c)	✓	
CO-3	Award Architect/Engineer Contract (c)	✓	✓			✓ (c)			
CO-4	Approval of Schematic Design	✓				✓ (c)			
CO-5	Approval of Preliminary Design	✓				✓ (c)			
CO-6	Approval of Working Drawings	✓				✓ (c)			
CO-8	Approval to Award Construction Contract	✓	✓ (h)	✓		✓ (c)	✓ (c)	✓	
CO-11/11a	Construction Change Order/Justification (a)	✓	✓	✓		✓ (c)			
CO-11ae	A/E Change Order (a)	✓	✓	✓					
CO-12	Schedule of Values / Appl. for Payment (b)	✓	✓	✓					
CO-14	Project Closeout	✓	✓	✓	✓	✓ (c)	✓ (c)		

Building Official Forms

Form ID	Description	Traditional Des/Sid/Build	Construction Management	Design- Build	PPEA	HECO	HEMA	ESCO (g) Capital Proj	ESCO (g) Non-Cap Proj
CO-17a	Application for Building Permit (e)	✓	✓	✓ (d)	✓ (d)	✓		✓ (f)	✓ (f)
CO-13.3a	Application for Certif. of Use and Occupancy	✓	✓	✓	✓	✓	✓ (c)		

Notes:

- Any change orders exceeding the limits requiring approval by the Governor's Designee must be submitted to BCOM.
- Copies of the first and final copies of the Schedules of Values are to be submitted to BCOM.
- Informational copies are to be submitted to BCOM (for DPB).
- Preliminary design documents for the complete project are required to be submitted to BCOM for review and approval to establish code compliance. (Cost estimates, fuel studies, HVAC system analyses, and checklists that are not required to determine VUSBC compliance may be excluded.) Working drawings are required to be submitted to BCOM for review and approval for the specific scope of work being permitted (foundation, structure, etc.) in order to obtain a partial Building Permit.
- Changes in the Work required pursuant to the VUSBC shall be submitted to BCOM.
- Provide closeout documentation for Building Permit.
- Requirements listed are for "standalone" ESCO projects. If ESCO is a component within a capital project that has other non-ESCO work, then follow the form submission requirements for capital projects.

* Special Project Classes:

- PPEA** - Public- Private Educational Facilities and Infrastructure Act of 2002
- HECO** - Higher Education Capital Outlay (delegated capital outlay authority for selected college and university projects)
- HEMA** - Restructured Higher Education Financial and Administrative Operations Act Management Agreements (applies to selected University of Virginia, Virginia Tech, and College of William & Mary projects)
- ESCO** - Energy Performance Contracts
(See: Department of General Services Contract C300020)

- For Construction Management at Risk projects, the agency must submit documentation that agreement on scope of work and Guaranteed Maximum Price (GMP) has been reached in order to obtain approval of CO-8.

Agency Advantages of Performance Contracting

- **Performance Metrics for long-term Agency Energy Partner commitment by contractor; customer satisfaction is a requirement of program success**
- **Guaranteed Savings; consumption value is critical determinant**
- **Holistic Facilities Approach to create efficiencies with equipment and human resources**
- **Information can be used to assist in continued development of DGS FICAS inventory, and to determine Maintenance Reserve Plan**

Energy Awareness

Energy Awareness Potential Benefits

3-20% Reduction in Building Energy Use



1% Investment Recommendation

Energy Awareness

What Can Occupants Control?



Lighting

Computers



Temperature Settings

Water Use



Rechargers



Equipment Purchases

Energy Awareness

Energy Awareness Strategies

- Complete Organization Buy-in
- Set Goals, Publicize Results
- Recognize & Reward Success
- Two-way Communication
- Personalized Messages & Graphics




Energy Awareness

Energy Awareness Communication



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brought to you by... William Beaumont Hospital

welcome to Enervision™



Joyce Smith
Head Nurse, Radiology
Royal Oak Campus



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welcome to Enervision™



Welcome to Enervision™, the William Beaumont Hospital utility savings web site. Over the coming weeks, you will see the Enervision™ logo everywhere, from bulletin boards to emails, on service vehicles and banners. Our goal is to make every member of the Beaumont community – medical staff, administration, service personnel, facilities support, and patients – aware of what they can do to reduce energy and water use while accomplishing our mission of providing the highest quality health care.

This year, the Beaumont hospital has budgeted over \$17 million for utilities at the Royal Oak and Troy campuses. Our goal is to cut utility use by 6% in 2006 – that's \$1,000,000 that otherwise would not be available for health services.

This web site is the main avenue for Enervision™ communication. We will provide you with useful, entertaining articles, activities, and event notices related

Scoreboard	
Royal Oak Campus	\$13,400,000
Troy Campus	\$3,900,000

Measurement and Verification

Why Does it Matter?

Common Theory...

Energy Efficient Engineering

+ Enough Money in the Budget

+ Good Contractors; Project Mgmt

= >90% of Savings

Measurement and Verification

Why Does it Matter?

Common Theory...

“Risk allocation refers to whether the contractor (a) is responsible only for equipment performance (efficiency), or (b) also bears some risk related to operational factors...”

DOE, Measuring Performance

Measurement and Verification

Why Does it Matter?

Savings Potential =

25%

Energy Efficiency

Design
Equipment Specs
Performance Data

75%

Energy Conservation

Control Systems
Sequences
Schedules
Commitment / Training

Measurement and Verification

Why Does it Matter

Better Theory...

M&V Approach

- Energy Efficient Engineering**
- + Enough Money in the Budget**
- + Good Contractors; Project Mgmt**
- + Continuous Commissioning**
- + Entity with Vested Interest**
- = 100% Percent of Savings?**

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