



Enhancing Building Renovation Projects Through Energy Performance Contracting (EPC)



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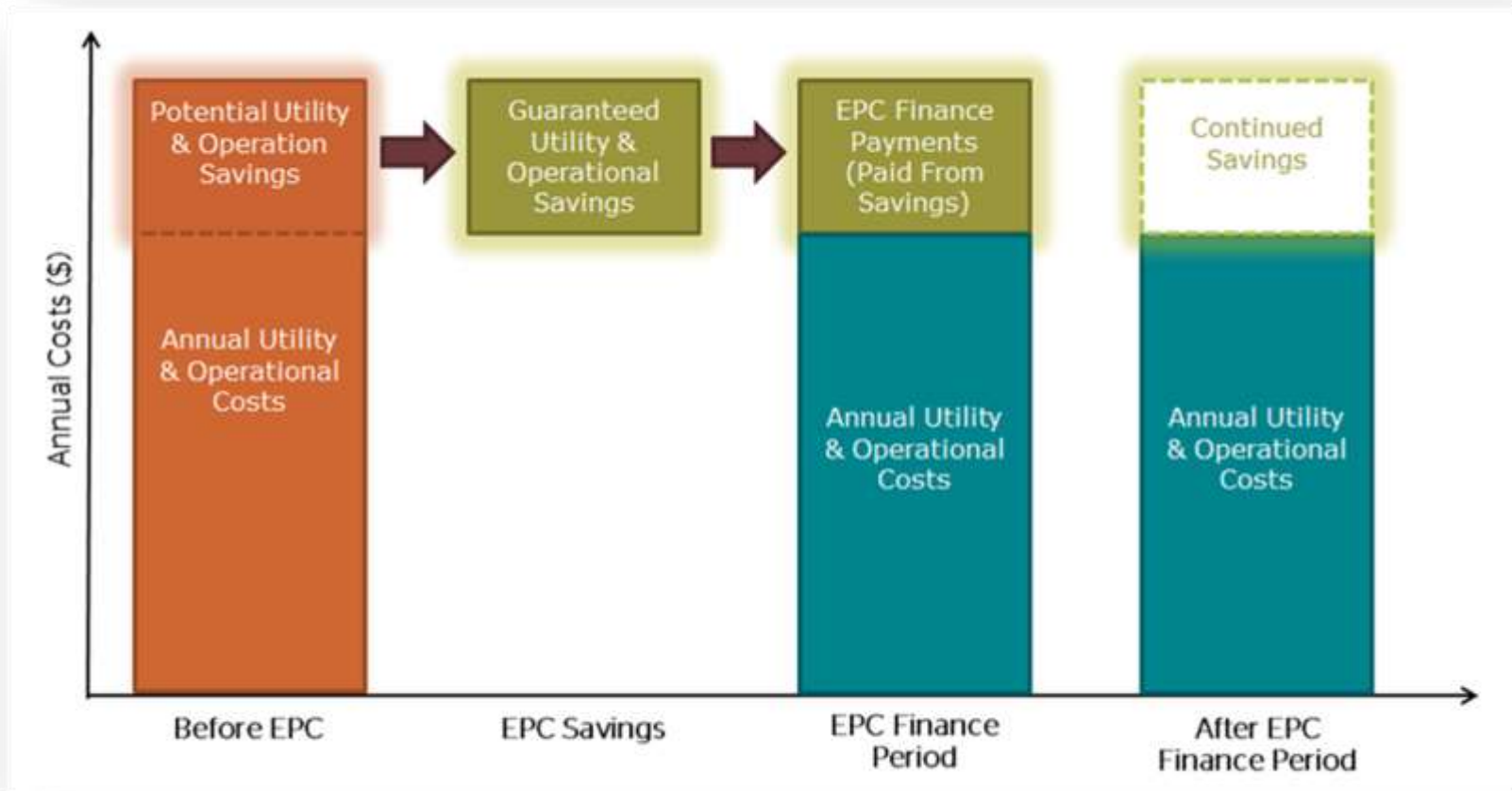
What is Energy Performance Contracting?

“An innovative contracting mechanism which provides the funding for facility improvements today through future utility and operational cost savings”

- Energy Services Coalition



EPC Project Funding



Case Study: University of Colorado Boulder MacAllister Project Overview

- UCB purchased building in 2012 with 290,000 square feet on the East Campus
- Unoccupied multi-use building that included offices and a data center
- Commercial grade facility which required major upgrades to meet institutional requirements
- Part of Sustainability, Energy & Environment Complex (SEEC)
- McKinstry was selected by UCB to integrate EPC into the remodel project to fund additional scope



Case Study: University of Colorado Boulder MacAllister EPC Development Summary

It's all about the baseline...

1. Develop baseline - utility data, building modeling, previous vs planned occupancy levels
2. Investigate ALL potential facility improvement measures (FIMs)
3. Calculate and model building performance with full occupancy
4. Calculate/Model base vs enhanced building with full occupancy levels
5. Delta funds the improvements over time (15-20 year term)
6. Minimum of 3 years of M&V to prove the savings are achieved



Case Study: University of Colorado Boulder MacAllister EPC Upgrades

Additional project scope accomplished by EPC:

- *Included previously unfunded MEP scope*
- **New high efficiency central plant and AHU upgrades**
- **New Andover BAS installation**
- **Comprehensive LED lighting scope**
- **Occupancy-based lighting & HVAC controls**
- **Building envelope improvements**
- **Domestic water upgrades**

Case Study: University of Colorado Boulder MacAllister EPC Financial Summary

- **\$10.94M** total project:
 - **\$8.26M** of EPC upgrades
 - **\$2.68M** of traditional mechanical, electrical & plumbing scope funded by EPC project
- **\$543K** first year utility savings
- **\$29K** first year O&M material savings
- **\$148K** estimated utility rebates

Case Study: University of Colorado Boulder MacAllister EPC Project Outcomes

Facility	BEFORE EPC			AFTER EPC			% EUI Reduction
	Electric EUI	Gas EUI	Total EUI	Electric EUI	Gas EUI	Total EUI	
MacAllister Building	114.5	37.4	151.9	54.0	7.1	61.2	59.7%



53% reduction in electric EUI



81% reduction in natural gas EUI



\$543,000 annual decrease in utility costs



60% combined reduction in building EUI

Note: EUI = "Energy Use Intensity" is the total amount of energy used annually per ft²

Case Study: University of Colorado Boulder MacAllister EPC Project Lessons Learned

- **Integrate ESCO early in the process**
- **GC-OWNER-ESCO must collaborate as a TEAM**
- **Define financial goals upfront – cost, savings, term**
- **Consider facility condition assessment in the audit**
- **Include added contingency for unforeseen conditions**
- **Fully define commissioning scope and cost**



Thank You!
Questions...