

# Energy Performance Contracts for the City of Boulder

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## ENERGY PERFORMANCE CONTRACTING

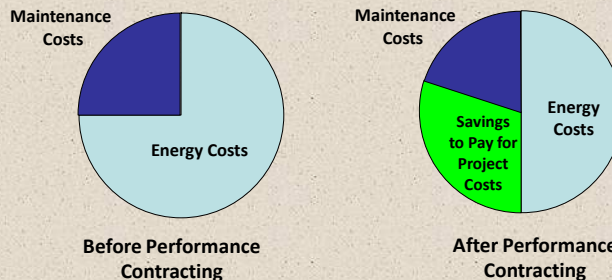
- **The CO Governor's Energy Office (GEO) administers the energy performance contracting program**
  - To meet Governor's goal of 20% energy reduction at all state facilities by 2012
  - 11-year-old program
- **What is Energy Performance Contracting (EPC)?**
  - A simple, quick way for facility owners to implement and finance building improvements and energy conservation measures
  - Energy conservation measures are funded through **guaranteed** future energy savings



# HOW DOES ENERGY PERFORMANCE CONTRACTING WORK?

## ▪ Energy Performance Contracting

- Finance infrastructure improvements over longer terms (up to 20 years)
- Energy savings generated from improvements are used to make the lease payments



## Purpose

- **EPC chosen as one method to help accomplish Boulder's energy conservation goals**
- **City of Boulder's EPC Program Goals**
  - Reduce GHG emissions, energy use, water use and costs across all city operations
  - Upgrade aging infrastructure in a fiscally constrained funding environment
  - Incorporate renewable technology and maximize demand side management opportunities with SmartGrid initiatives
  - Leverage ARRA, State and utility funding opportunities
  - Improve comfort, aesthetics, productivity
  - Add/Improve building automation systems



# McKINSTRY

## ▪ McKinstry’s team has been providing energy services for the past 12 years in Colorado

- 30+ dedicated energy services professionals
  - Project Directors/Account Managers
  - Program Development Managers and Energy Engineers/Auditors
  - Construction Managers/Site Superintendents
  - Commissioning Agents
  - Sustainability Experts

## ▪ McKinstry’s Clients Include:

- |                           |                               |
|---------------------------|-------------------------------|
| City of Golden            | City of Longmont              |
| City of Aspen             | City of Cortez                |
| Jefferson County          | Routt County                  |
| City of Steamboat Springs | Adams County                  |
| Colorado School of Mines  | City of Colorado Springs      |
| Fort Lewis College        | Commerce City                 |
| 8 School Districts        | Foothills Park & Rec District |



# McKINSTRY

## CAPABILITIES

CONSULTING | CONSTRUCTION | ENERGY | FACILITY SERVICES

### CORPORATE STATS

- 50+ years in business
- Design-build construction firm
- 100+ municipal clients; \$200M+ projects
- \$400M annual revenue/1,600 employees
- \$120M+ in rebates & grants
- 100+ Professional Engineers
- 60+ LEED AP professionals
- Vendor and Product neutral

### MUNICIPAL CLIENTS

- City of Seattle/King County
- City of Spokane, WA
- City of Boulder
- City & County of Denver
- City of Colorado Springs
- Jefferson County, CO
- Adams County, CO
- City of Corpus Christi, TX
- City of Boise, ID

## Energy Conservation Audit/Implementation

- Lighting audit and retrofits
  - 10,239 fixtures to be retrofit = 1,382 KW of existing lighting power
  - Ball field lighting
- Water conservation audit - 57 buildings & irrigation
  - Kudos to the city on conserving irrigation water
  - 1,591 fixture to adjust/modify/calibrate
- Building envelope: 57 buildings audited; “weatherization” at 43
- Solar PV at 9 locations – total output of 711 kW
- Solar thermal pool heating systems at 2 Recreation Centers
  - 19,300 annual therm output
- Mechanical Replacements (chillers, boilers, air handlers, etc.)
- Variable frequency drives
- Building controls, scheduling and optimization/re-commissioning

## EPC Program Results

	Phase 1	Phase 2	Total
Electricity Reduction	1,299,795 kWh	4,440,363 kWh	5,740,158 kWh
Gas Reduction	7,868 therms	155,708 therms	163,576 therms
Water Reduction		2,796 kgals	2,796 kgals
Utility Cost Savings	\$87,759/year	\$419,745	\$507,504/year
Maint Cost Savings	\$4,805/year	\$42,386/year	\$47,191/year
CO2 Reduction	1,152 mtons/year	4,620 mtons/year	5,772 mtons/year
Future Capital Avoided	\$546,000	\$1,287,000	\$1.83 million
On-going Incentives:			
PV REC payments	\$31,565/year	\$21,355/year	\$52,920/year
CCF REC payments		\$50,000/total	\$50,000

# Project Financials

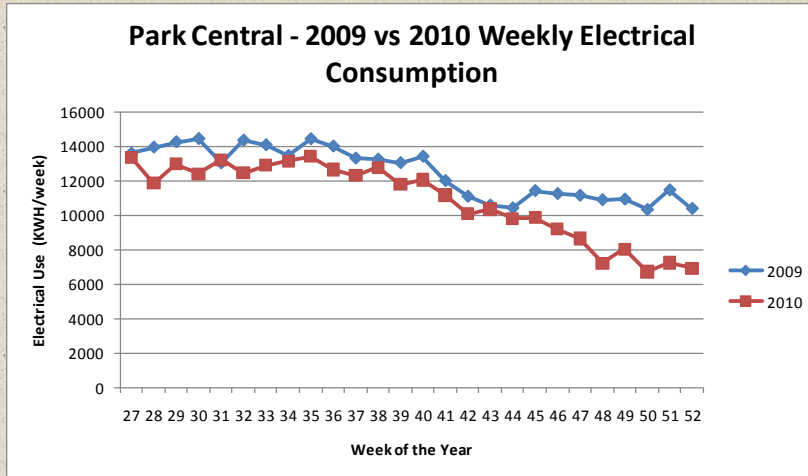
	Phase 1	Phase 2	Total
Total Project Value	\$2,888,711	\$8,138,999	\$11,027,710
Xcel Energy Solar PV Rewards Rebate	(\$632,064)	(\$778,900)	(\$1,410,964)
Xcel Energy Standard Offer Rebate	(\$80,885)	(\$417,230)	(\$498,115)
Project Cost to Boulder	\$2,175,762	\$6,942,869	\$9,118,631
EECBG	(\$213,501)	(\$146,499)	(\$360,000)
City Capital	(\$462,261)	(\$398,337)	(\$860,598)
Financed Amount	\$1,500,000 QECBs @ 1.46% - 13Y	\$6,398,033 @ 3.5% - 15Y	\$7,898,033

QECB – Qualified Energy Conservation Bonds

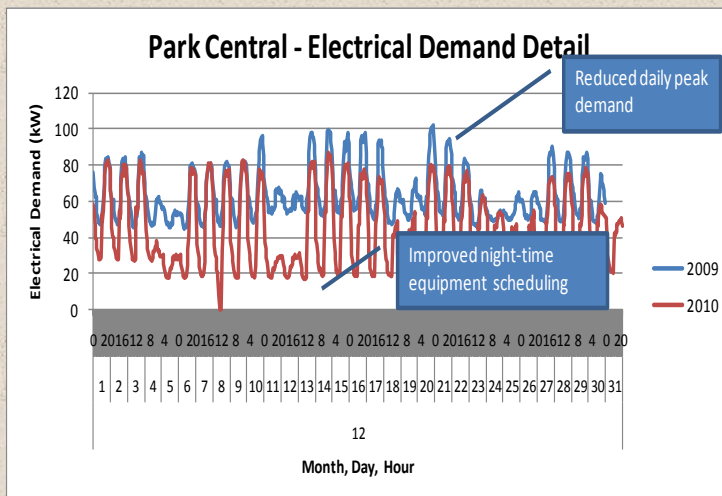
# City Operations GHG Emissions

Description	Electricity (kWh/yr)	Natural Gas (therms/yr)	Fuel (gal/yr)	Planned CO2 (metric tons)	Expected EPC CO2 (metric tons)	Cost/MMBtu & Return on Investment
2008 Baseline Energy	31,338,062	950,223	295,088			
(metric tons)	27,363	5,047	2,626	33,710	33,710	
Solar PV - 2009/2010						
- 3, 10 kW systems				(33)	(33)	
- 1 MW system at WWTP				(1,288)	(1,288)	
Existing Hydro Production*	(30,100,000)			(14,765)	(14,765)	Not Included
Planned Strategies						
- Energy Efficiency in EPC	(4,768,386)	(139,936)		(1,936)	(4,816)	\$182/ 9.5%
- Solar PV (20 vs. 9), EPC	(971,772)			(3,022)	(830)	\$593/ 6.2%
- Solar Thermal at Rec Centers, EPC		(8,760)		(47)	(126)	\$321/ 1.8%
- Energy Education and Policy	(525,129)	(16,161)		(537)	Assumed same	
- Fleet Operations			(59,000)	(532)	Assumed same	
- Total Reduction				(7,365) = 21.9%	(8,162) = 24.2%	

# Initial Results – Park Central Administration Building



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## Next Steps - Phase 3

- 33 buildings still available for additional energy retrofits
  - Possible \$5 million in additional retrofits
  - Additional 350 kW; \$2 million in solar PV
  - Smart Buildings and Employee Education
  - Another 3,000 mtos of CO2 reductions
  - Annual utility savings of \$300,000
  - Overall goal was to accomplish >20% reduction in carbon emissions through the EPC
    - ~17% reduction accomplished with Phases 1 & 2
    - Possibly another 9% - **Total 26%**

