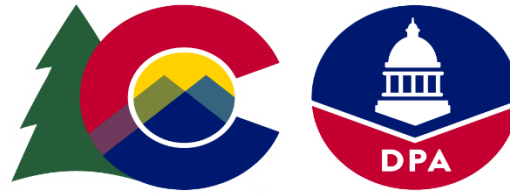
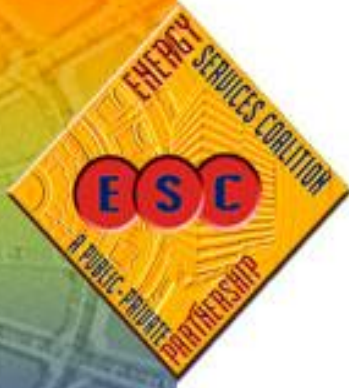


Department of Personnel & Administration DCA – Capitol Complex Architects



COLORADO
Division of Capital
Department of Personnel & Administration

Who are we?



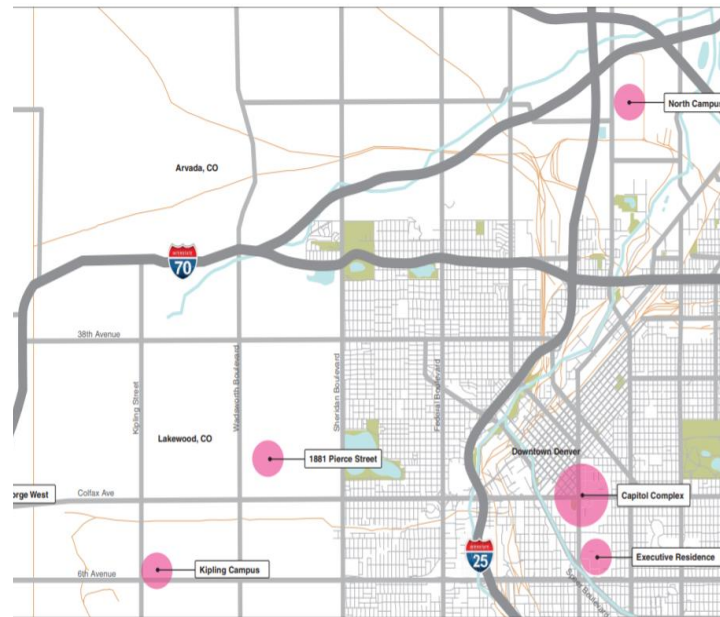
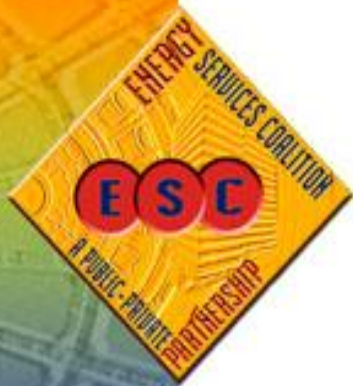
Capitol Complex Architects
Supports our building's tenants
spatial needs as well as
requesting and implementing
controlled maintenance and
capital construction projects.

Division of Capital Assets



- State Capitol Building
- Governor's/Executive Residence
- 14 Office Buildings
- 1 Multi level parking garage
- Camp George West grounds
- Lincoln Park - 14th & Lincoln St.
& multiple parking lots

DPA State Buildings



Capitol Complex – Denver Campus

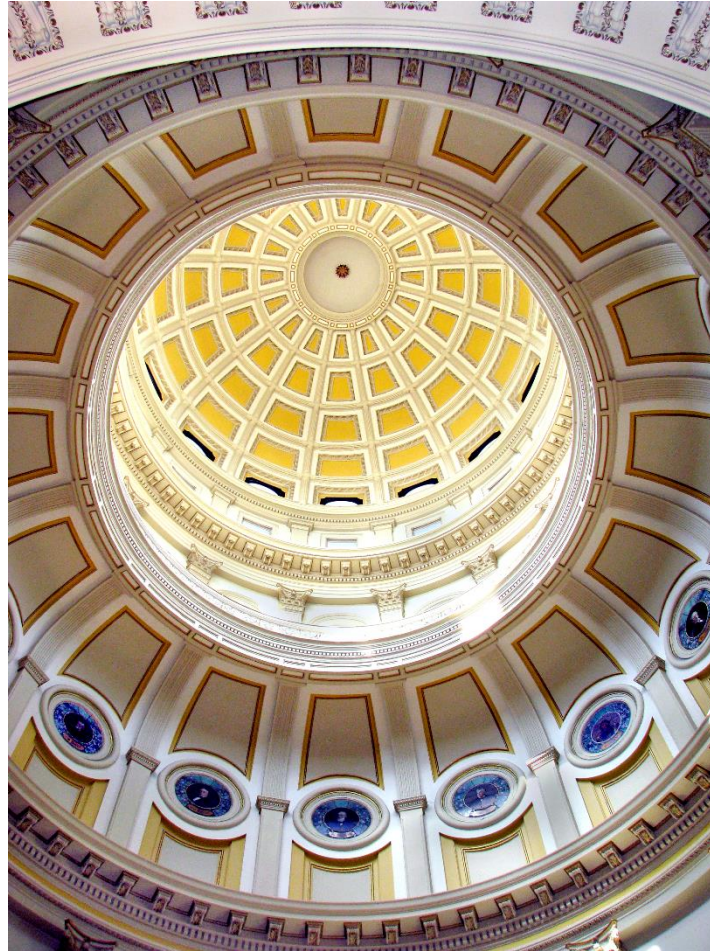
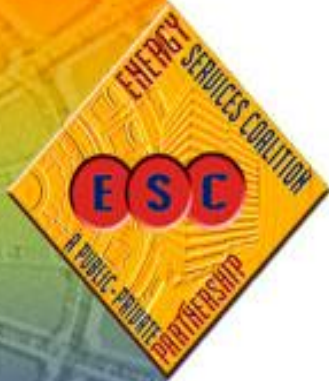
- Power Plant
- HSB
- Capitol Building
- LSB
- Capitol Annex
- Centennial
- Parking Garage
- SOB
- SSB
- 1570 Grant

Outside Downtown Denver Locations

- 1881 Pierce, Lakewood
- 690 & 700 Kipling, Lakewood
- Governor Residence
- Carriage House
- Camp George West, Golden
- North Campus, N. Denver
- State Services, Grand Junction

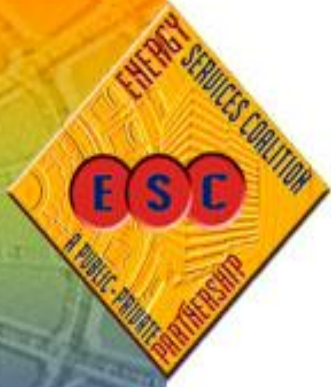
State Capitol Building

2008 LEED EBOM Certified

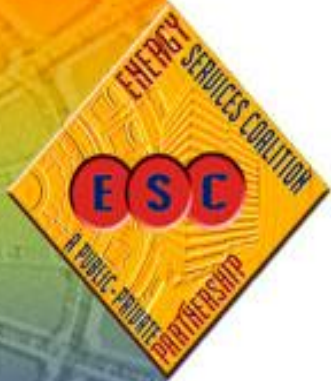


State Services Building

2007 LEED-EB



State Office Building

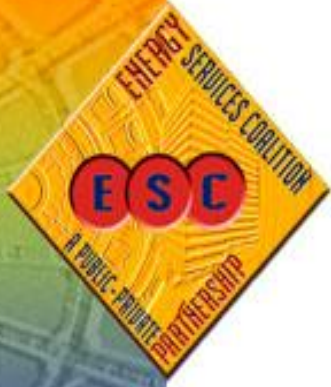


Human Services Building

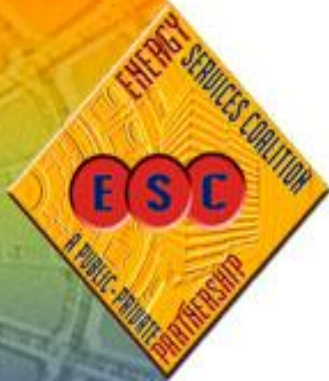
2007 LEED-EB



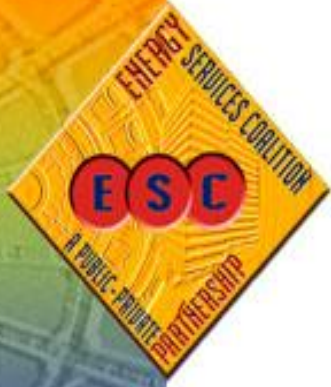
1570 Grant Street



Legislative Services Building



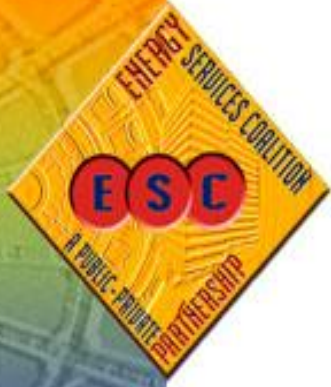
State Capitol Annex Building



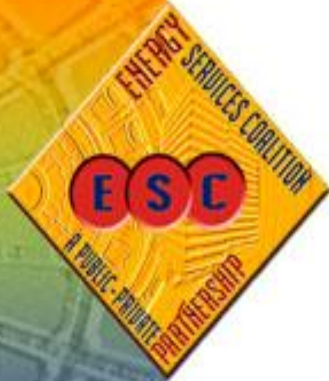
Centennial Building



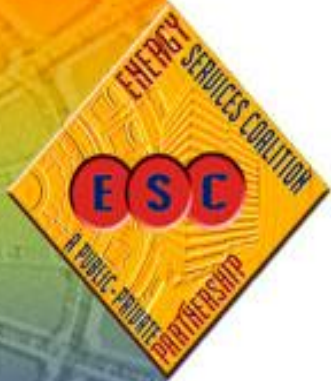
690 & 700 Kipling



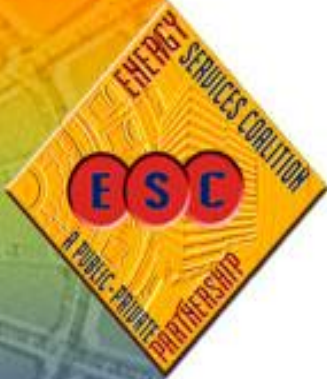
1881 Pierce Street



North Campus



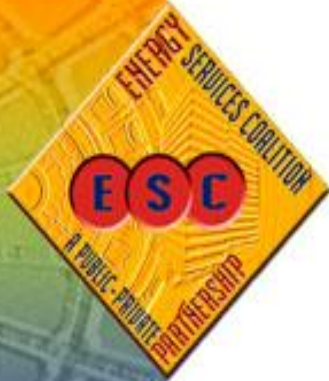
Grand Junction State Services Building



Judicial & History Colorado

2008 LEED-EB

Demolished for new Colorado Supreme Court Building



Governor's Residence

2007 LEED EB Certified



DPA – EPC

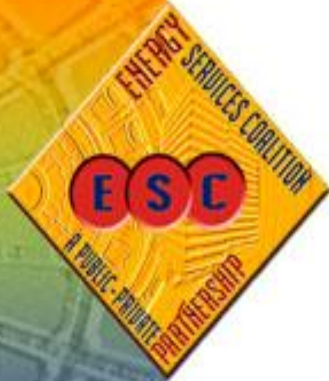
2002 - 2013

Phase I

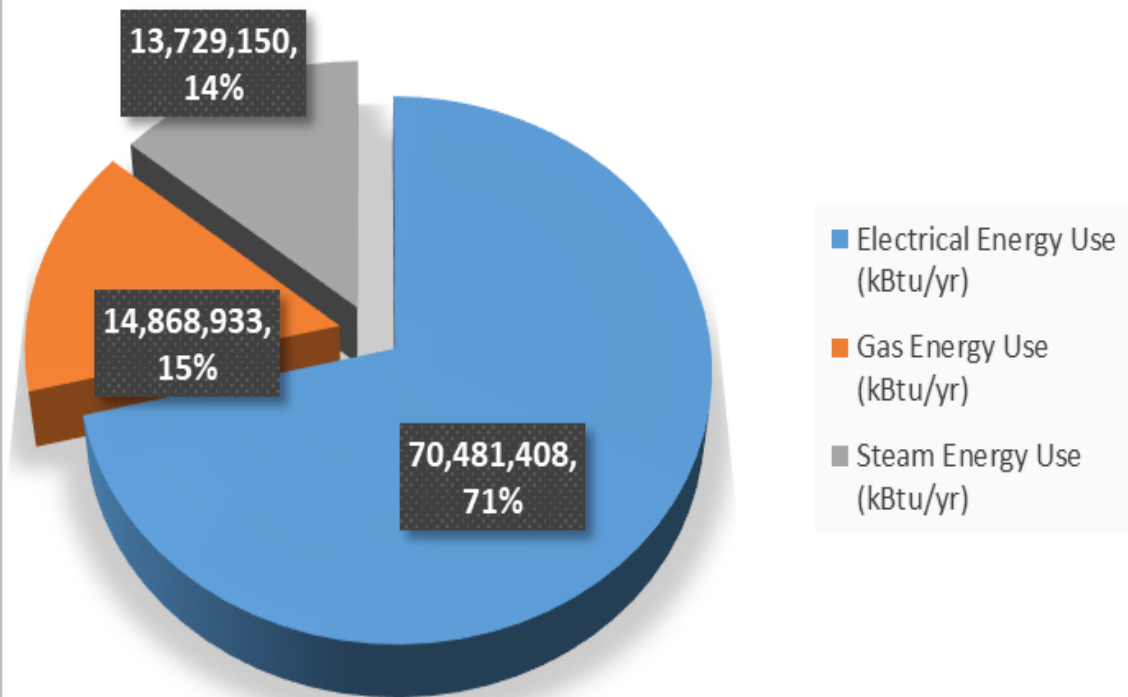
- Investment grade audit reviewed all DPA assets and delivered a shopping list/aka Energy Conservation Measures.
- HVAC upgrades
- Interior lighting
- Energy management systems – EMS/BAS
- New boiler plant – Xcel
- Chilled water loop upgrades



Utilities

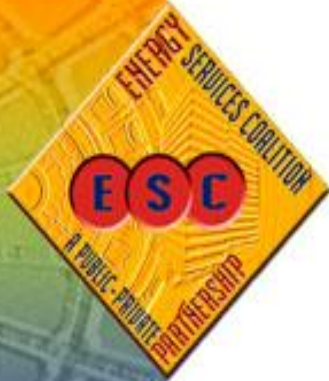


Annual Energy Use



Phase I

ENERGY COSTS /YR. PRIOR TO EPC



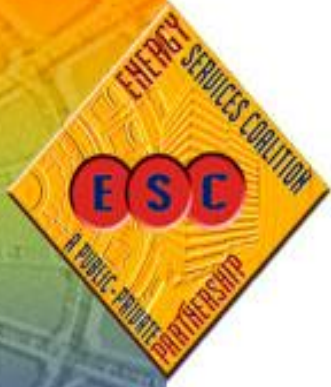
| | |
|---------------|--------------|
| • ELECTRICITY | \$2M |
| • NATURAL GAS | \$51K |
| • STEAM | \$368K |
| • WATER/SEWER | <u>\$96K</u> |
| – TOTAL | \$2.6M |

Phase I

Energy Conservation Measures 28 ECM's Identified \$9.3M

- 28 ECM's Identified during IGA
- Replace T12 fluorescent w/T8 fluorescent & electronic ballast
- Replace incandescent with Compact Fluorescent
- Water
- VFD's
- Building Envelops
- CHW Optimization
- DDC Controls
- ERCM
- Power Plant Boiler





Phase II

\$4.5M

- Lighting Controls
- DDC Controls
- CDLE
- Power Plant Chiller
- 690 Kipling Mechanical

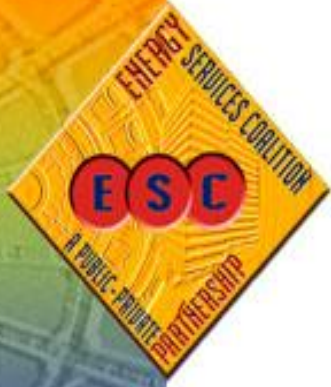
Phase III

\$9.2M



- Geothermal & GSHP – Governor's Residence
- Boilers – GJ State Services Building
- CRAC Units – 690 OIT & CBI Data Centers
- Photo Voltaic – 1881
- Photo Voltaic – State Capitol Building
- Condensing Boilers – HSB, LSB, SSB & 1570 Grant

1881 Pierce Street PV

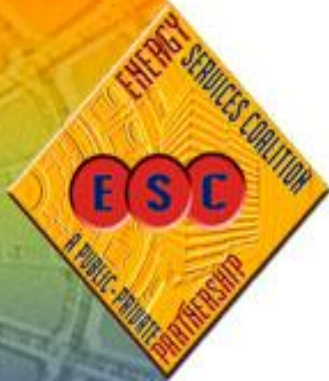


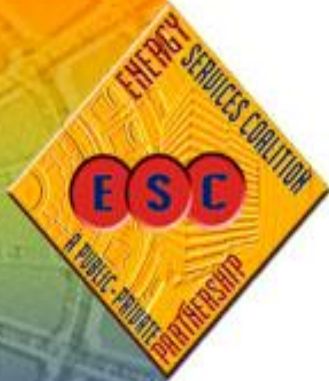
Wells under construction

32 vertical boreholes installed, each
400 feet deep.



Heat Pump Equipment





Phase IV

\$4.6M DOE ARRA Grant

\$1.4M EPC

- Geothermal State Capitol Building

Open Loop System

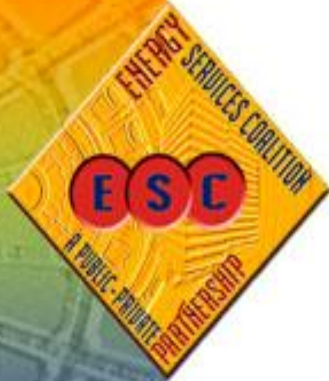
- 1 – 2 supply wells
- 1 – 2 recharging wells
- 800 + feet to Arapahoe Aquifer
- Provide infrastructure for future expansion of the system
- Reduce Capitol's operating costs by more than \$100,000 per year.

Heat Pump Equipment

22 air handlers dating from the 1940's to 1980's - Attic SCB



New EPC 2019



- Governor's 2040 Goal
- DPA's 2020 Goal 100% LED's all Capitol Complex Buildings
- IGA Phase I Complete
- Replace all fluorescent bulbs with LED
- Retrofit LED kits - Centennial Building & NC
- IGA Phase II Centennial Building HVAC distribution
- Window & Exterior Insulation Commissioning – Centennial Building
- Chiller Plant & Chilled Water Loop Commissioning – Power Plant
- Other ECM Phase II Opportunities

EPC Benefits

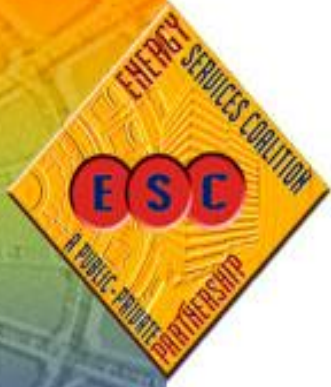


- Replaces old equipment with modern state of the art energy efficient technology
- Replaces old pneumatic technology with DDC control systems
- Systems integration through energy management technology
- Provides funding steam for larger capital projects

EPC Contributions



- 30% reduction in projected energy costs
- More than \$8M in utility cost savings to date
- 41,368 metric tons of carbon emissions offset, the equivalent to removing 8,858 cars from the road for a year
- LEED-EB of five buildings
- 1st State Capitol Building in the nation to be LEED certified

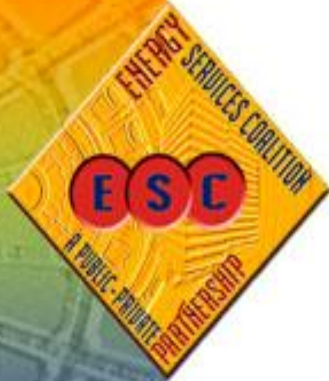


Larger Capital Projects

DPA Funding Request demonstrates combination of EPC, CM, CC and COP's for building renovation



What Motivated DPA to pursue multi-phase EPC's



- seeing the performance of the project with guarantees.
- EPC provides less risk as contract costs are locked in and performance of the system backed by the guarantee so savings persist.
- 'low-hanging' fruit in phase I LIGHTING produced quick energy savings during guarantee 3 year period.
- Excess savings from Phase I and Phase II helped fund phase III.
- PV Xcel had good incentives that were leveraged and rebates of course in each phase.