



United States Department of Agriculture

Sustainable Operations Collective Forest Service Job Corps

Connecting Consumption with Education

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USFS, R2 Center for Design and Interpretation



Forest
Service



SustainableOperations

What is Job Corps?

Job Corps was founded by President Lyndon Johnson on August 20, 1964. (50 year Anniversary this summer)

Job Corps (JC) is Nation's largest career technical training and education program for interested low income young people between the ages 16 through 24.

125 Job Corps Centers (JCCs) across the US, including the District of Columbia, Puerto Rico, Alaska, and Hawaii.

No cost to students.



Trapper Creek Job Corps Center



What does Job Corps offer?

Hands-on training in more than 100 career areas. Samples include: Masonry, Electrical, Plumbing, Culinary Arts, Welding, Nursing, High School Diploma.

Students studying the Manufacturing, Automotive, or Construction career technical training areas also receive training in variety of green subject areas.

Training programs are aligned with industry credentials and are designed to meet the requirements of today's careers.

“Work-Based Learning” and community service programs allow students to gain experience with local employers prior to graduation.

Courses in independent living, employability and social skills are also offered.



Counseling Building,
Flatwoods Job Corps
Center



Education Building,
Angell Job Corps
Center

Job Corps Statistics

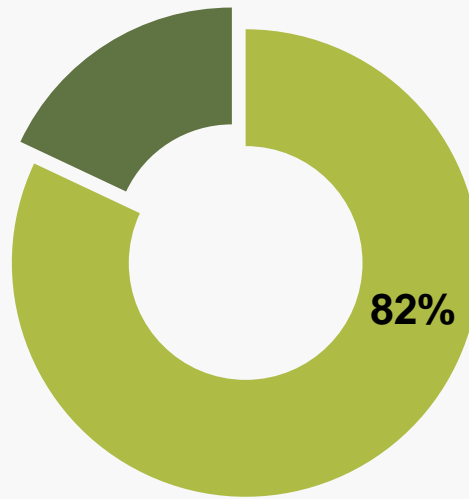


Sex



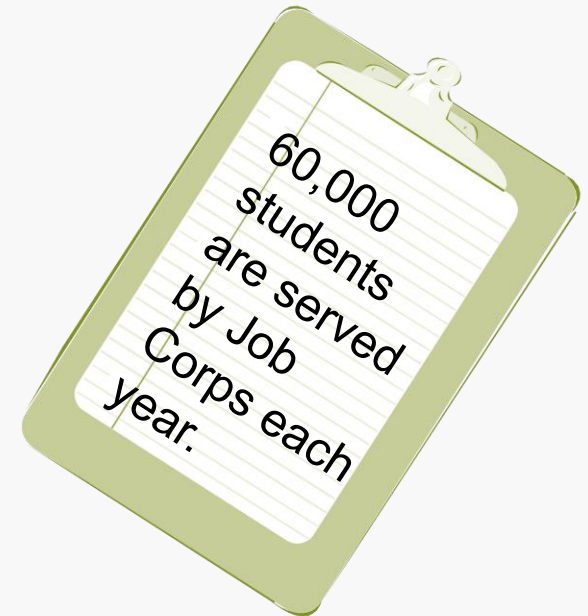
Race

82% of graduates join the workforce, enlist in the military, or enroll in higher education



2.7m

Students have graduated from Job Corps since its inception



Job Corps and the Forest Service

Each Job Corps Center is funded by the Department of Labor but managed by either another agency, or private enterprise.

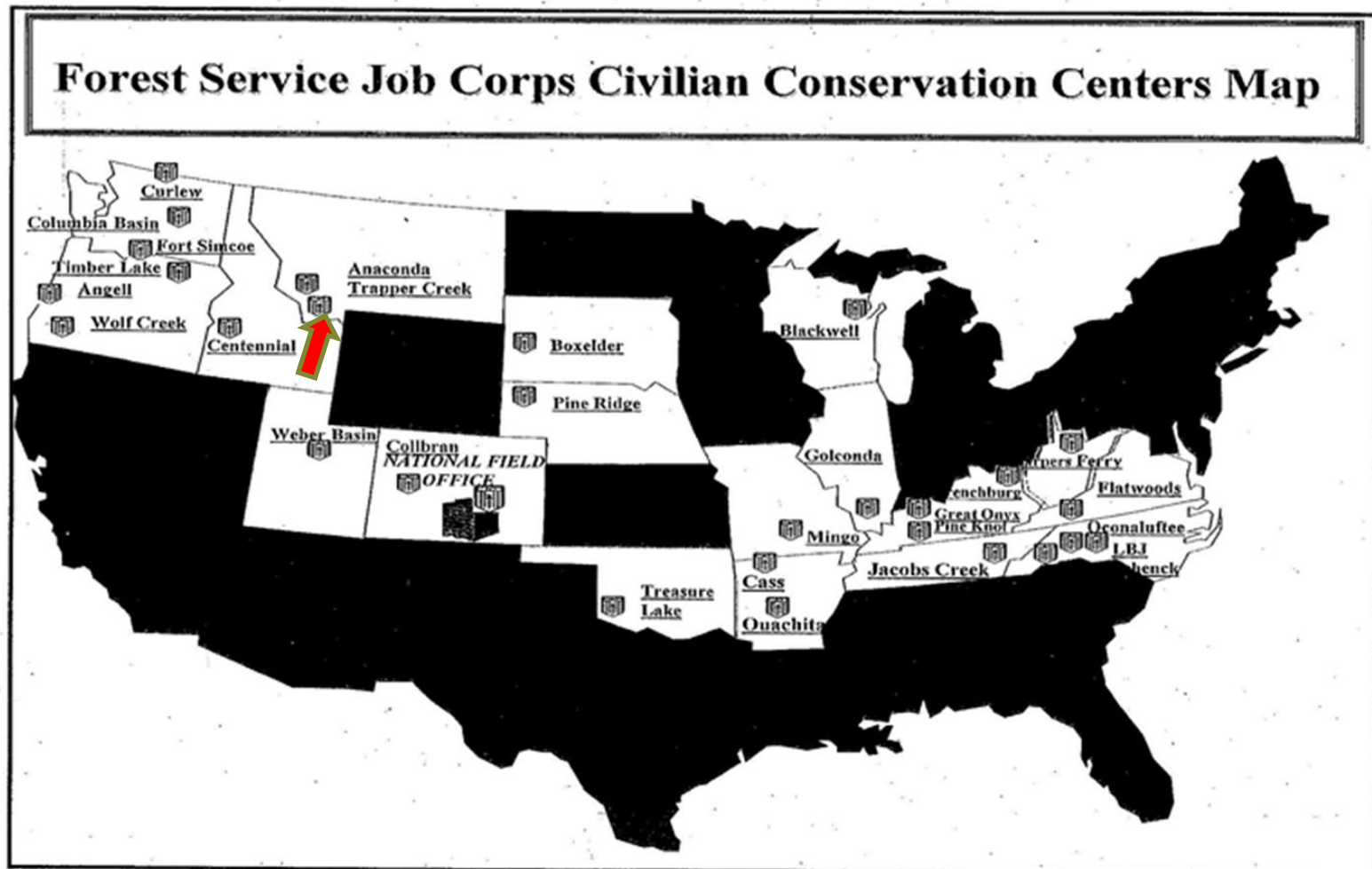
The National Office for Forest Service Job Corps is located in Golden, Colorado. R2 CDI provides Engineering support services.

Job Corps Centers employ a variety of disciplines including teachers, nurses, admin staff, and maintenance staff.

The Forest Service manages 28 of the 125 Job Corps Centers.



Job Corps and the Forest Service



Job Corps and the Forest Service

Each JC has numerous facilities, most of which were constructed in the 1960's, so are therefore inefficient and in need of maintenance or replacement. (bldg life cycle is over)

Some JCC's are being proactive and are seeking out ways to reduce their energy consumption, save money, and meeting Executive Order requirements.

Trapper Creek Civilian Conservation Center Darby, Montana

BUILDINGS

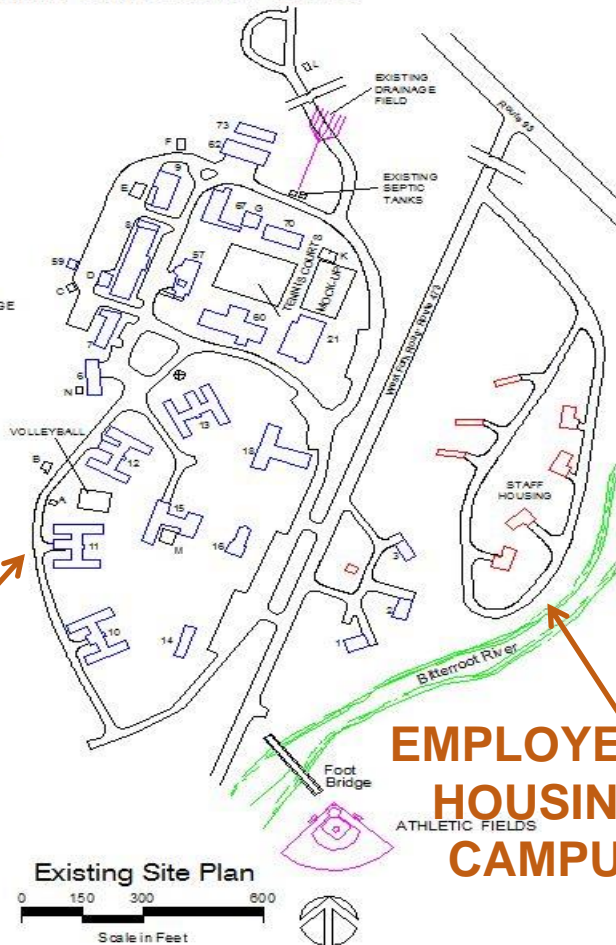
- 1- TRANSITIONAL DORMITORY
- 2- TRANSITIONAL DORMITORY
- 3- TRANSITIONAL DORMITORY
- 6- PLUMBING SHOP/ LAUNDRY
- 7- CENTRAL VEHICLE MAINT.
- 8- WELDING SHOP / FORESTRY
- 9- BUILDING MAINTENANCE SHOP
- 10- MEN'S DORMITORY
- 11- MEN'S DORMITORY
- 12- MEN'S DORMITORY
- 13- WOMEN'S DORMITORY
- 14- MEDICAL DISPENSARY BLDG
- 15- FOOD SERVICE BUILDING
- 16- ADMINISTRATION BUILDING
- 18- ACADEMIC EDUCATION
- 21- GYMNASIUM
- 57- WAREHOUSE
- 59- EMERGENCY RESPONSE STORAGE
- 60- RECREATION BUILDING
- 62- CARPENTRY SHOP
- 67- MASONRY SHOP
- 70- ELEC. REPAIR SHOP
- 73- CARPENTRY STORAGE

STRUCTURES

- A- WELL HOUSE
- B- MAIN PUMP/GENERATOR HOUSE
- C- FUEL DISPENSING SHELTER
- D- ADVANCED WELDING SHED
- E- SAND BLASTING SHED
- F- FLAMMABLE STORAGE
- G- MASONRY SHED
- K- ELECTRICAL STORAGE
- L- PUMP HOUSE
- M- PAVILION
- N- VOCATIONAL STORAGE

MAIN CAMPUS

EMPLOYEE HOUSING CAMPUS



Trapper Creek Job Corps Center (TCJCC)

Located near Darby, Montana

Current student population = 248 (68 females and 180 males)

Facility Portfolio:

- 23 primary buildings with 160,113 GSF total
- 18 ancillary buildings with 11,960 GSF total
- Total of 41 structures with 172,073 GSF

Site is all electric.

Partnership has been developed between the Job Corps, the utility provider (Ravalli Electric), and Bonneville Power Administration.





Trapper Creek Job Corps Center Energy Efficiency Projects Update

Monday, July 28, 2014

Bonneville Power Administration (BPA) Energy Efficiency
Erik Boyer-Mechanical Engineer

Overview

Bonneville Power Administration(BPA) Background

BPA Energy Efficiency (EE) Background

Why EE for Federal Facilities?

TCJC EE Overview

- Past work
- Recent work
- Future

Questions/Discussion



BPA Background

Established in 1937 by FDR

Self-funded Federal Agency (subset of DOE)

Markets wholesale power to public utilities from 31 Dams from Columbia river system, 1 nonfederal Nuclear and other nonfederal power plants.

Transmission Lines = over 15,000 miles (BPA sells capacity on these)

Substations = 261

Employees = 3,175

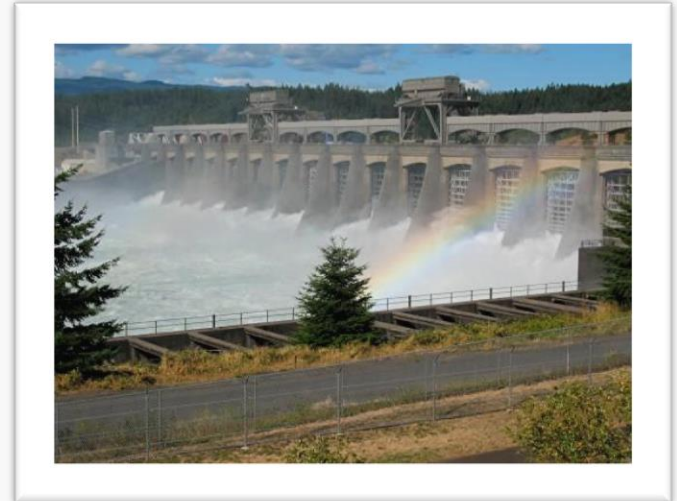
Customers = 142 (includes Co-ops, Munis, PUDs, Federal, IOU, Direct Service, Tribal)



BPA EE Background

Early
1980s

- Northwest Power Act requires BPA to provide the most cost effective resource.
- BPA EE was created.
- BPA is federally mandated to obtain the lowest cost resource=EE



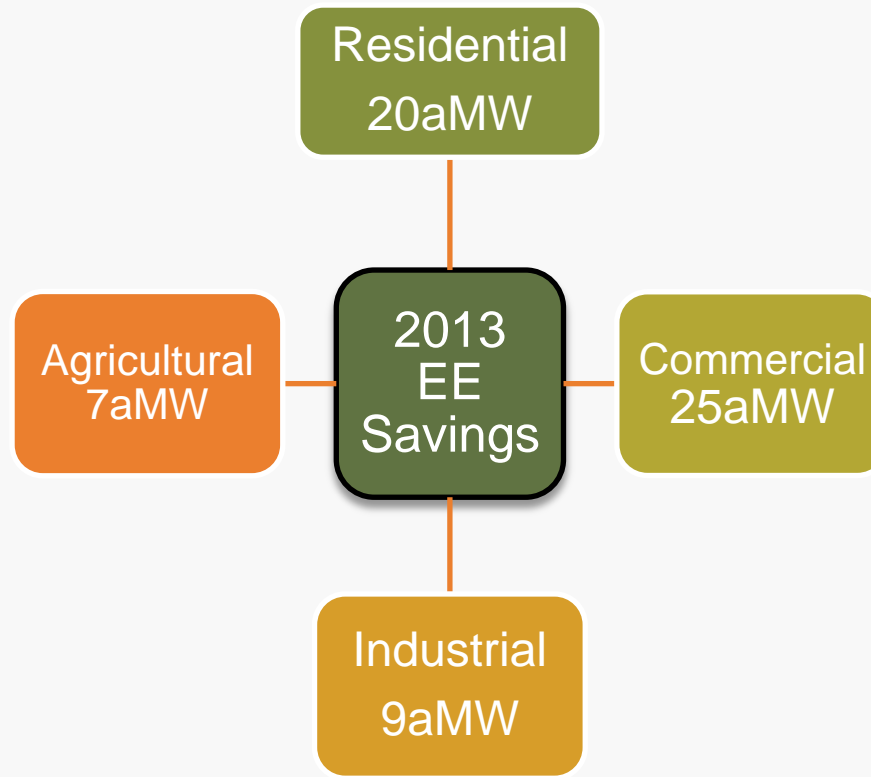
1981
to
2012

- +1,400aMW (over full output of equal to output of Bonneville Dam



BPA EE Background (cont.)

BPA EE programs = Residential, Commercial, Agricultural, Industrial, and R&D.



Why EE for Federal Facilities?

EO 13423—What's that?

- The reduction of energy by 3% each year to hit 30% by 2015 from 2003 levels.

Federal Register Vol. 72, No. 17 Friday, January 26, 2007	Presidential Documents
Title 3—	Executive Order 13423 of January 24, 2007
The President	Strengthening Federal Environmental, Energy, and Transportation Management
	<p>By the authority vested in me as President by the Constitution and the laws of the United States of America, and to strengthen the environmental, energy, and transportation management of Federal agencies, it is hereby ordered as follows:</p>
	<p>Section 1. Policy. It is the policy of the United States that Federal agencies conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner.</p>
	<p>Sec. 2. Goals for Agencies. In implementing the policy set forth in section 1 of this order, the head of each agency shall:</p>
	<p>(a) improve energy efficiency and reduce greenhouse gas emissions of the agency, through reduction of energy intensity by (i) 3 percent annually through the end of fiscal year 2015, or (ii) 30 percent by the end of fiscal year 2015, relative to the baseline of the agency's energy use in fiscal year 2003;</p>



TCJC EE Overview

BPA REBATE PROGRAM

- Available to any Federal Agency served by a BPA utility customer.
- A “Holding Account” is established at BPA for the Unit. (requires an MOU between Unit and BPA.)
- Amount of rebate depends on the type of project.
- BPA provides the rebate based on actual savings. Verification is required after project completion.
- Rebate amount is placed in the holding account.
- Trapper Creek JCC currently has approximately \$45K in their account.
- Can put this money towards a future project.



TCJC EE History

Late 2011

BPA Scoping Audit

- 1997 Energy Study (done by another party)
- 2010-2011 Facility Survey (included 16 largest facilities)



Challenges

- All facilities at main campus are served by one electrical meter

Trapper Creek Job Corps Civilian Conservation Center

ENERGY SCOPING AUDIT



ANALYSIS PERFORMED BY:

Erik Boyer & Andrew Helle
Bonneville Power Administration
707 W. Main Ave, Suite 500
Spokane, WA 99201

November 7, 2011



TCJC EE Baseline

5yr Average Annual Energy Usage

- 3,200,000kWH
- \$172,000/yr

Summer Peak

- 125,000kWH/mo
- \$6700/mo

Winter Peak

- 422,000 kWh/mo
- \$22,600/mo

Non-weather dependent

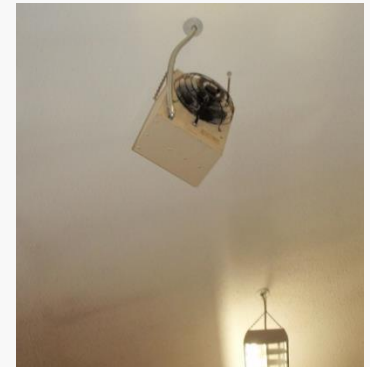
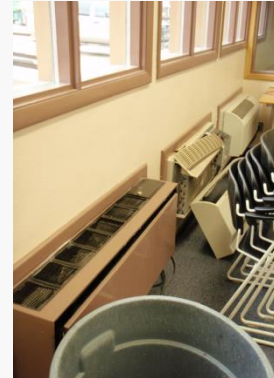
- 135,000kWH/mo
- \$7200/mo

Normalized Annual Energy Usage = 3,102,385kWh or 10,585 MMBTUs, which equates to 66,111 BTUs/GSF.



TCJC EE Overview-Recent

Late 2011 – BPA Scoping Audit

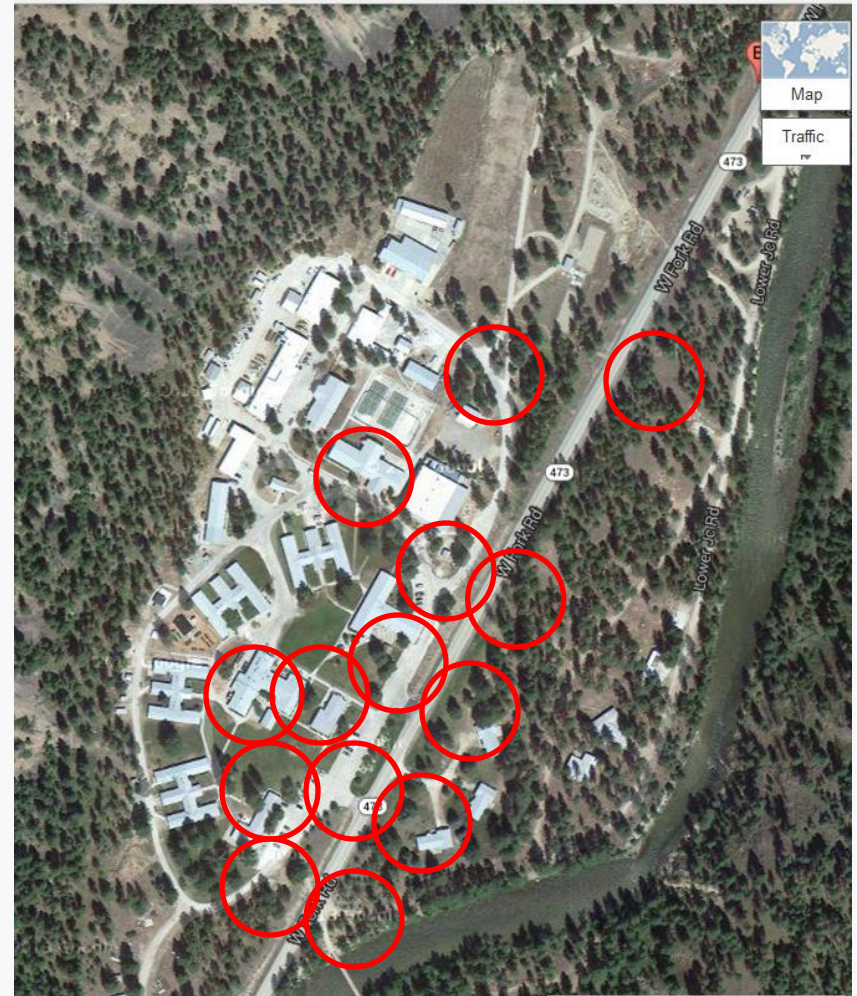


TCJC EE Overview-Recent

Late 2011 to present

Installed individual building metering at 14 locations

- Food Service
- Dorms (4)
- Academic
- Recreation
- Carpentry
- Welding
- Gym
- Admin (currently)
- Medical (currently)
- Well (water system)
- Waste Water System



TCJC EE Overview-Recent

Late 2011/Present– Metering/Loggers



TCJC EE Overview-Recent

Metering Results

- Dorm #3 HVAC = 117,364kWh/yr (3.8%*)
- Carpentry Heating = 63,003kWh/yr (2% *)
- Food Service Radiant Boiler = 106,287kWh/yr (3.4%*)
- Medical Center = 49,822kWh/yr (1.6%*)

*percentages are compared to overall use at main campus

TCJC EE Projects

Campus Wide:

- 26 Projects identified for a total projected savings of 335,000kWh+ (\$18,000+)
- Main Campus: 17 Projects implemented for a total actual savings = 315,000kWh+ (10.2% - year 2). EO 13432 requires 30% reduction in energy intensity (BTU's/GSF) by 2015.

Employee Housing Campus:

- 9 Projects = 20,000kWh+

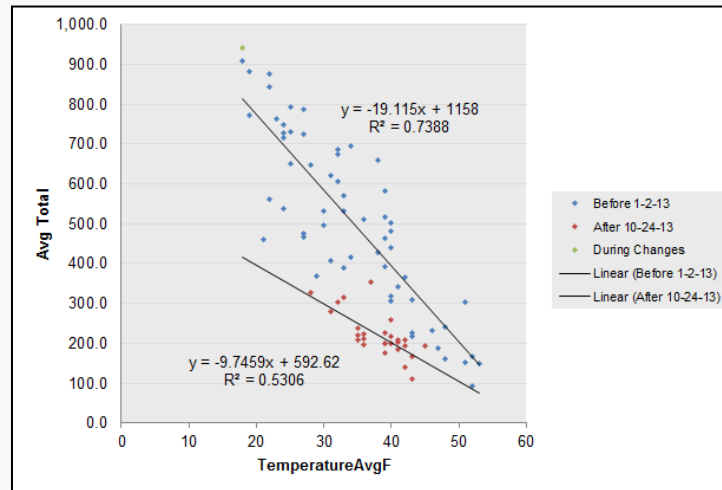
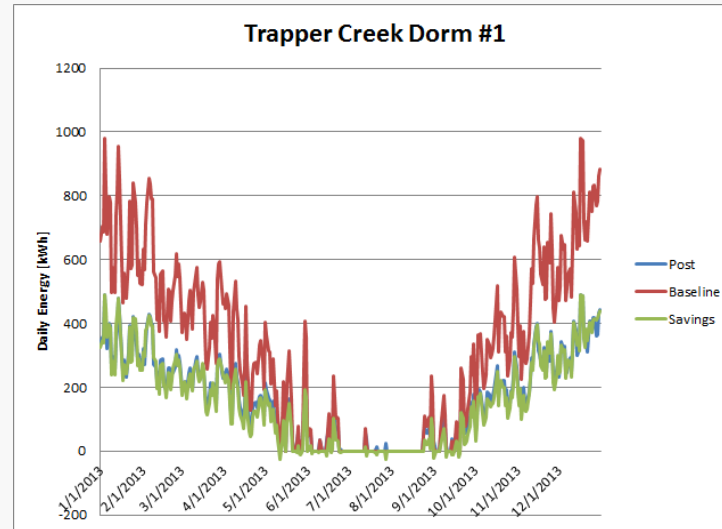
Project Name	Annual Site Savings [kWh]
Food Service Attic Insulation #1	12,579
Food Service Attic Insulation #2	3,246
Food Service Attic Insulation #3	2,029
Food Service Attic Insulation #4	30,838
Food Service Pipe Insulation (not a completed CR)	18,000
Food Service Gen-Set EGBH	3,285
Food Service-South Kitchen Heat Pump (not completed)	18,274
Administration Attic Insulation	12,261
Dorm #1 (Duct Sealing, WEPT, Attic Insulation, Air Sealing)	56,321
Dorm #2 (Duct Sealing, WEPT, Attic Insulation, Air Sealing)	29,353
Dorm #3 (Duct Sealing)	64,520
Dorm #4 (Duct Sealing)	48,656
Dorm #3 (WEPT, Attic Insulation, Air Sealing)	Not yet determined
Dorm #4 (WEPT, Attic Insulation, Air Sealing)	9,558
Welding Shop DHP	2,446
Water Well Gen-Set EGBH	3,774
Wastewater Gen-Set EGBH	1,589
Residence DHP #1	3,816
Residence DHP #2	3,816
Residence DHP #3	3,816
Residence Attic Insulation #1	427
Residence Attic Insulation #2	413
Residence Attic Insulation #3	325
Residence Duct Sealing #1	2,903
Residence Duct Sealing #2	2,903
Residence Duct Sealing #3	2,562
Total	337,710

TCJC EE Projects

Dorm #1 Project

- \$3,000 initial investment
- < 2yr Simple Payback (SP) / 50%ROI (Return on Investment (after rebate))
 - Web Enabled Programmable Thermostat (WEPT)
 - Duct Sealing/Repair
 - Attic Insulation
 - Air Sealing

	Energy [kWh]	% of Baseline
Projected Baseline Energy	116,929	
Projected Post Energy	60,608	51.8%
Energy Savings	56,321	48.2%



TCJC EE Projects

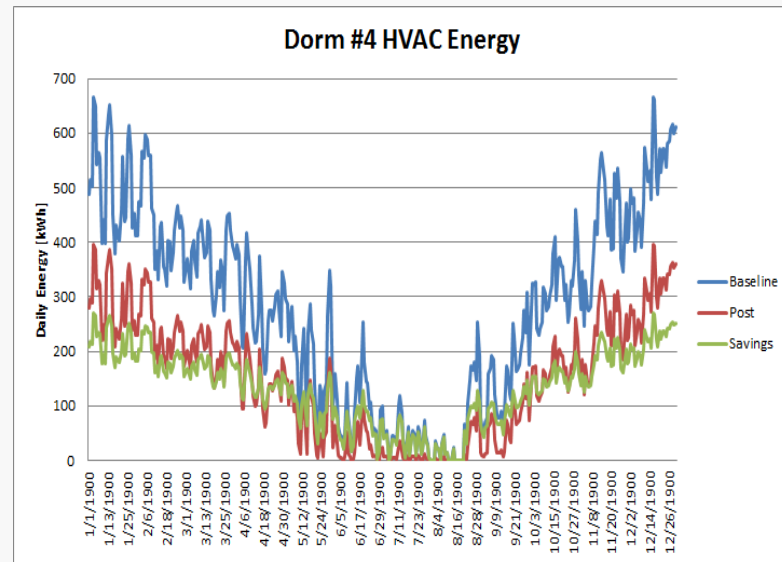
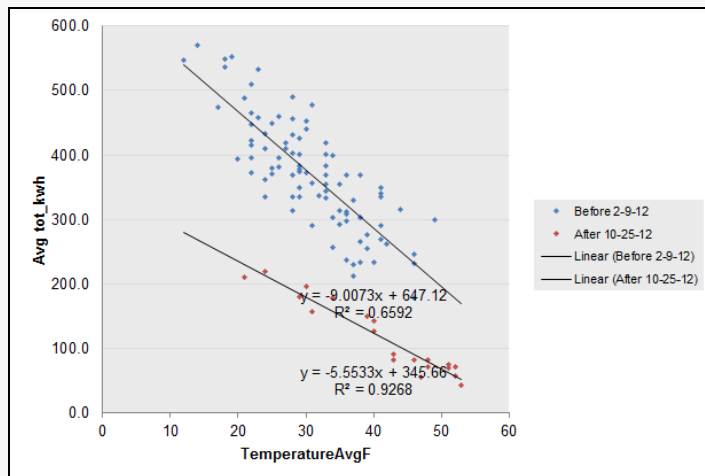
Dorm #4 Project:

(phase 1) +\$2,600 & < 6mo SP / 200%ROI (after rebate)

Duct Sealing/Repair

Dorm #4				
System	Pre-Flow	Pre-Pa	Post-Flow	Post-Pa
AB #1	241	232	104	270
AB #2	299	356	142	494
CD #1	481	136	231	214
CD #2	1633	218	174	122
Common	788	362	299	356

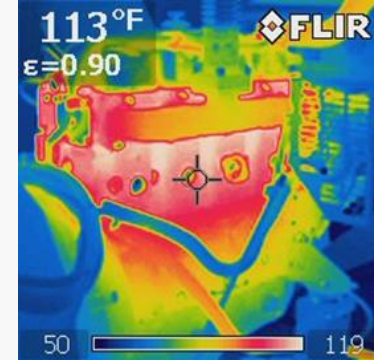
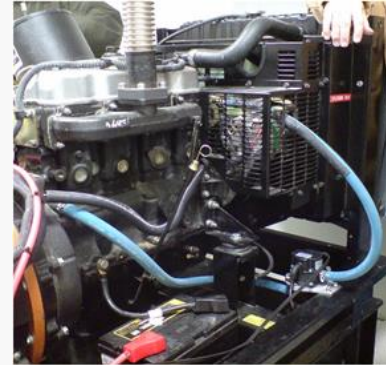
	Energy [kWh]	% of Baseline
Normalized Baseline	102,796	
Normalized Post	54,140	52.7%
Normalized Energy Savings	48,656	47.3%



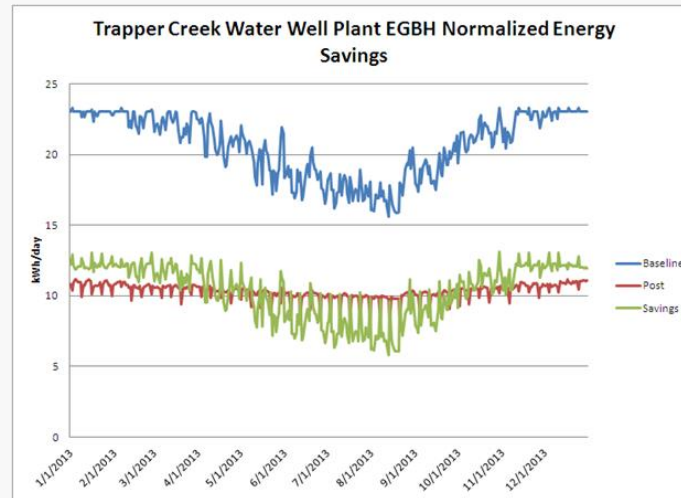
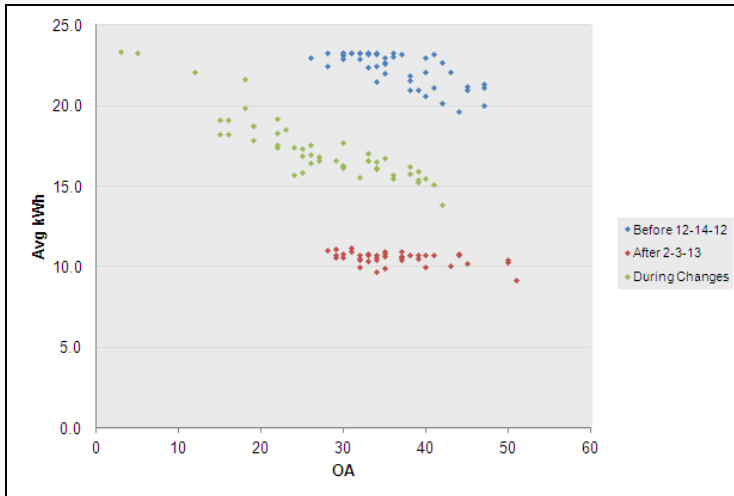
TCJC EE Projects

Technology Assessment:

Well stand-by Gen-Set EGBH Project:
 +\$200 & < **free** simple payback (after
 rebate)



7,538	Projected Baseline Energy
3,764	Projected Post Energy
3,774	Energy Savings
50.1%	Energy Savings, % of Baseline



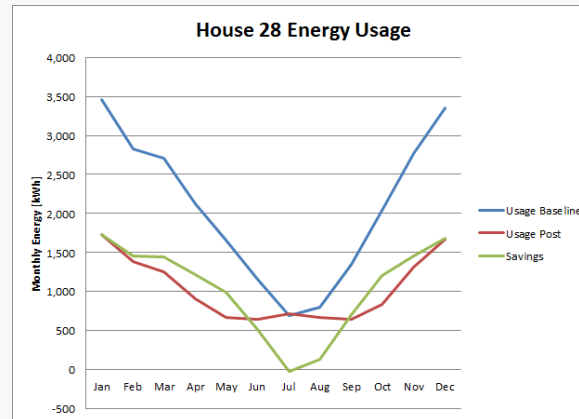
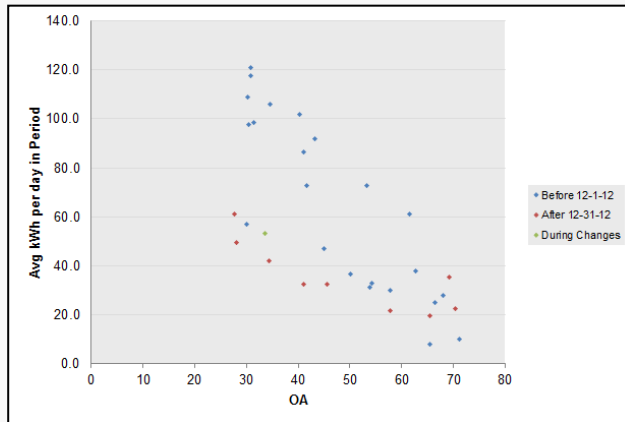
TCJC EE Projects

Residential Ductless Heat Pump + Attic Insulation Project: (House 28)

- +\$670

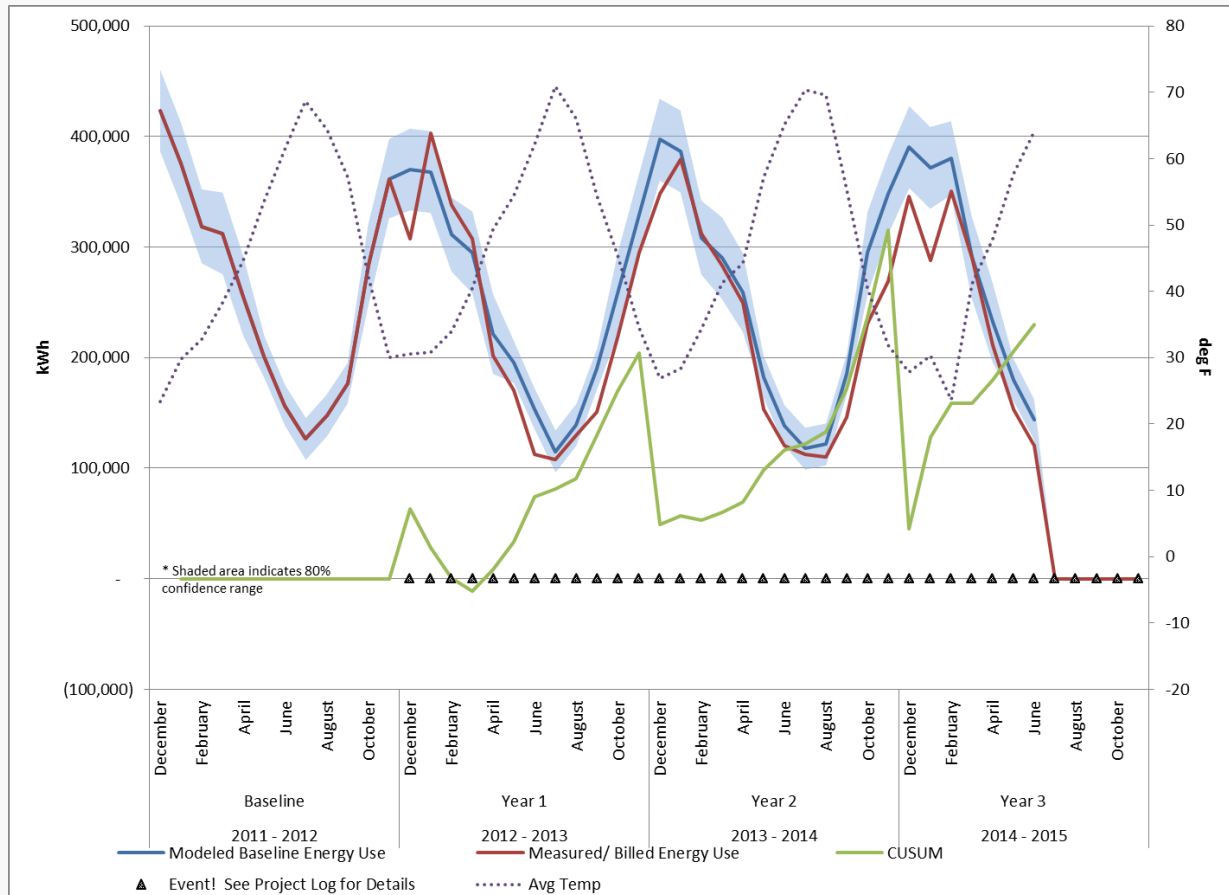


Projected Baseline Energy	24,966 kWh
Projected Post Energy	12,444 kWh
Energy Savings	12,523 kWh



TCJC EE Projects

Results from the Main Meter



TCJC EE Projects

Summary

- Residential Area
 - Measured Savings = 20,982kWh (on a meter separate from main meter)
- Main Campus
 - Measured Savings for Year 2 (2013) = 315,688kWh (10.2%)
 - Savings to Date for Year 3 (2014 (7 mo – through June 2014) = 229,897kWh (7.4%)
 - \$18,101 with combined Simple Payback of 2 years and Return on Investment (ROI) of 50%



TCJC EE Overview-Future

- In Progress Projects
 - Food Service South Kitchen Heat Pump (in progress)
 - WEPTs + Active Web-based Energy Management-facility upgrades (in progress)
 - LED Exit Signs (in progress)
- Future Projects
 - LED Flourescents
 - Insulation-facility upgrades
 - Water Source Geothermal in Gymnasium
 - Possible Campus wide Geothermal
 - Lighting Controls
 - Ductless Mini-Split Heat Pumps (Academic + Rec)
 - Duct Sealing-facility upgrades
 - Dorm Ventilation
 - HRV, DCV, Heat Pumps??



Acknowledgements

- Erik Boyer – Mechanical Engineer, Bonneville Power Administration
- Dan Gager, Work Program Administrator, Trapper Creek JCC
- Aurora Cutler- Communications, FS SusOps Collective



Questions and Discussion