Coeur d'Alene Tribe
Energy Efficiency Feasibility Study and Benewah Market Project

Department of Energy (DOE)
Tribal Energy Program Review
March 25, 2014

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Coeur d'Alene Tribe, Plummer, Idaho

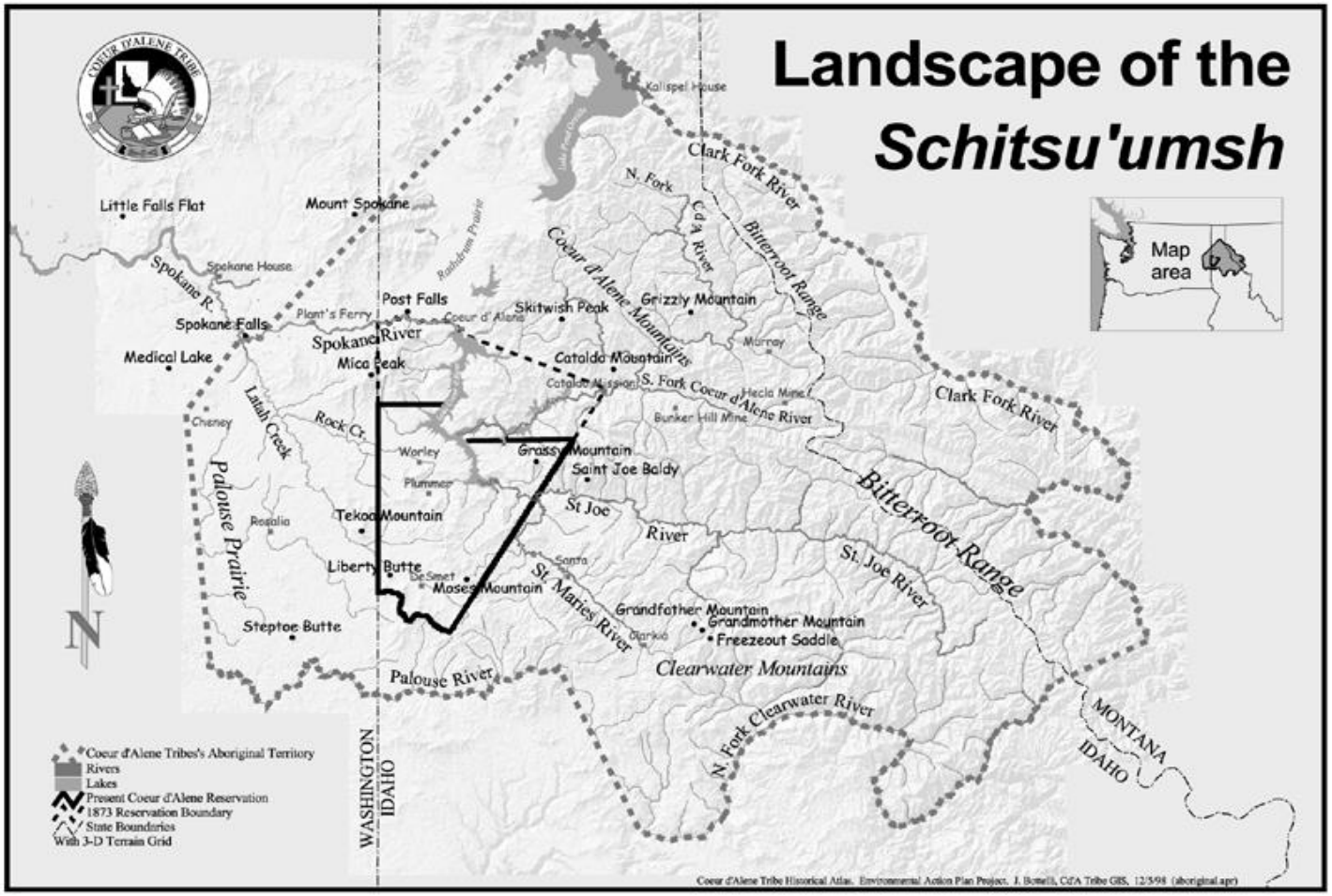
Presentation Outline

- Overview of the Coeur d’Alene Tribe
- Energy Efficiency & Conservation Block Grant Summary
- Energy Efficiency Feasibility Study – Results and Status
- Next Steps
- Lessons Learned
- Benewah Market Energy Efficiency Project
- Contact information

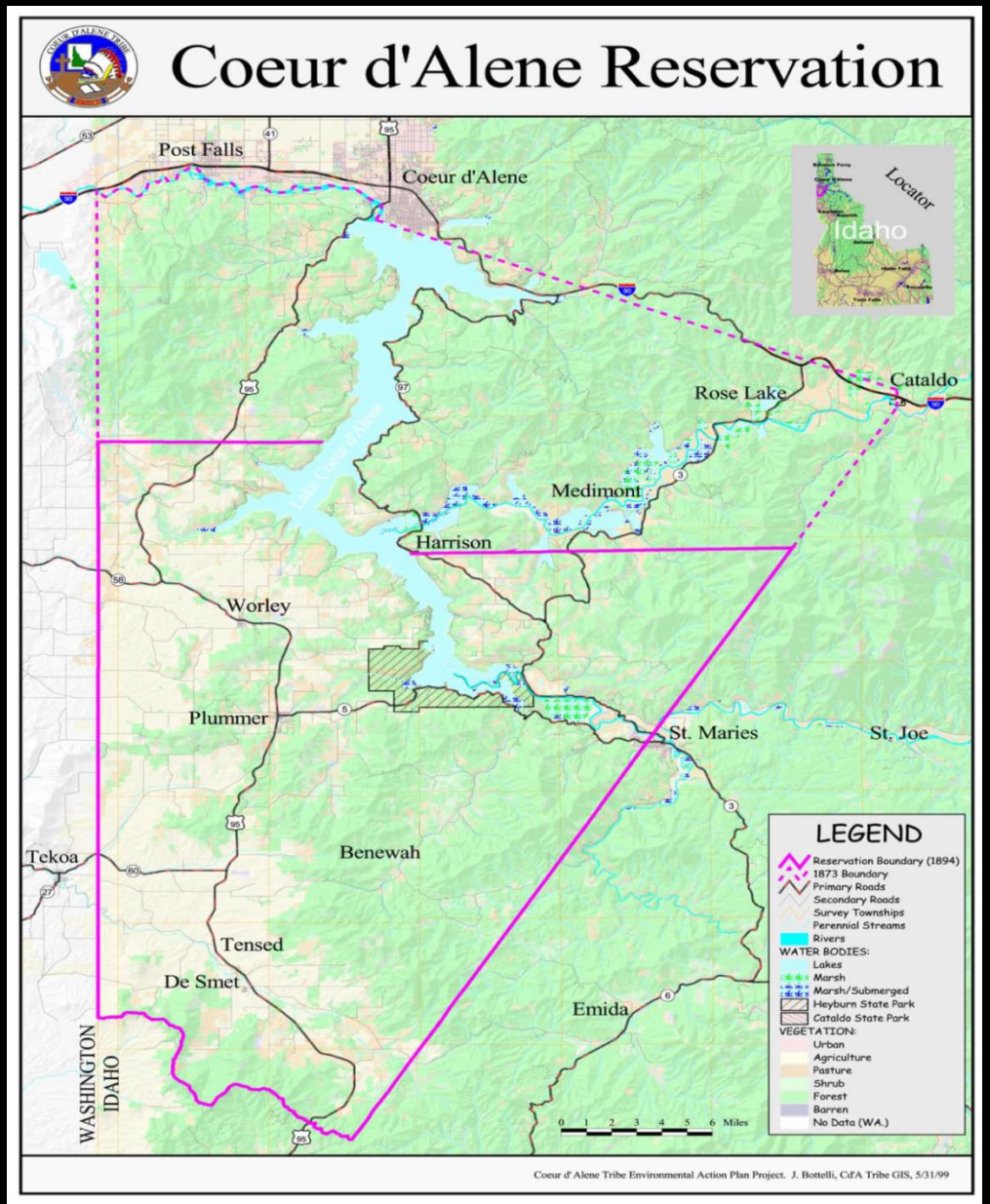
Overview of the Coeur d'Alene Tribe

- The Coeur d'Alene Reservation is approximately 334,000 acres, not including Tribal submerged lands.
- Aboriginal territory = more than 5 million acres.
- 6,451 residents according to the 2000 Census.
- Tribal enrollment is ~2,299 and growing.
- Tribe relies on forestry, agriculture, gaming, etc. in the current economy.
- Tribe continues traditional subsistence activities such as fishing, hunting and gathering foods and medicine.

Coeur d'Alene Tribal Map of Aboriginal Territory and Present Reservation Boundary



Coeur d'Alene Reservation



History of the Natural Resource Department

- In 1992, the Tribal Natural Resource Department was established as a stand-alone Department
- Currently, there are 7 programs in the NR Department: Air Quality, *Environmental Programs Office*, Fisheries, Forestry/Fire, Land Services, Pesticides Circuit Rider and Wildlife
- The Environmental Programs Office in the NR Department is administering the energy efficiency work

Prior Work: Energy Efficiency & Conservation Block Grant Funding

- June 2012 – The Tribe completed an Energy Efficiency Assessment Report working with McKinstry, Inc. for Coeur d'Alene Tribal government buildings. Energy conservation measures identified in 34 buildings evaluated included:
  - HVAC – Economizers, Programmable Thermostats, Heat Recovery, Heat Pump
  - Lighting Retrofits – Fluorescent, LED
  - Envelope Sealing and Insulation

Prior Work: Energy Efficiency & Conservation Block Grant Funding

- June 2012 – The Tribe also completed an Energy Efficiency & Conservation Strategy (EE&CS)

- McKinstry's energy audits were generally at ASHRAE Level 1
  - (ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning Engineers)

Energy Efficiency Feasibility Study (EEFS)

- The Tribe applied for and was awarded a U.S. Department of Energy, Energy Efficiency and Deployment in Indian Country grant in 2011 to conduct an EE Feasibility Study on all Tribal buildings
- Procured an energy consultant firm to perform in depth energy assessments:

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Energy Efficiency Feasibility Study (EEFS)

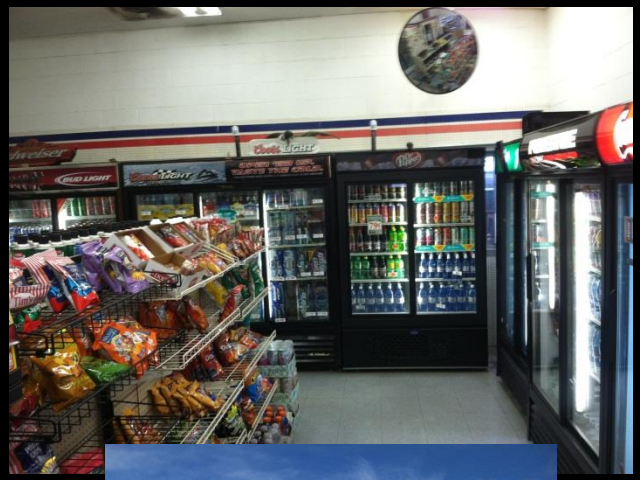
- The Tribe conducted an Energy Efficiency Work Group meeting with Tribal Staff and Utility Partners (October 29, 2012)
  - Current Issues and Planning with Target Structures
  - Energy Efficiency Project Criteria Development
  - Goals and Objectives
  - Utility Incentives
- Completed Energy Assessment Field Work
  - 36 Tribal Buildings Evaluated (October 29 – November 9, 2012)
  - Level 3 ASHRAE energy audits (investment grade)

Partnerships

- Coeur d'Alene Tribe, Plummer, ID
- OurEvolution Energy & Engineering, Arcata, CA
- Bonneville Power Administration (BPA), Spokane, WA
- Clearwater Power, Plummer, ID
- Kootenai Electric Cooperative, Hayden, ID
- City of Plummer, ID

Building Characterization

- Building Type
- Orientation
- Size
- Age
- Occupancy
- Usage
- Energy Providers
- Meters
- Tanks



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Envelope

- Siding
- Roof Drainage
- Windows and Doors
- Roofing
- Insulation
- General Conditions
- Attics
- Crawlspaces

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Heating, Ventilation and Air Conditioning

- System Types

Split Systems

vs.

Packaged Systems

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Heating, Ventilation and Air Conditioning

- System Types

Heat Pumps

vs.

Direct Expansion (DX) Air Conditioners

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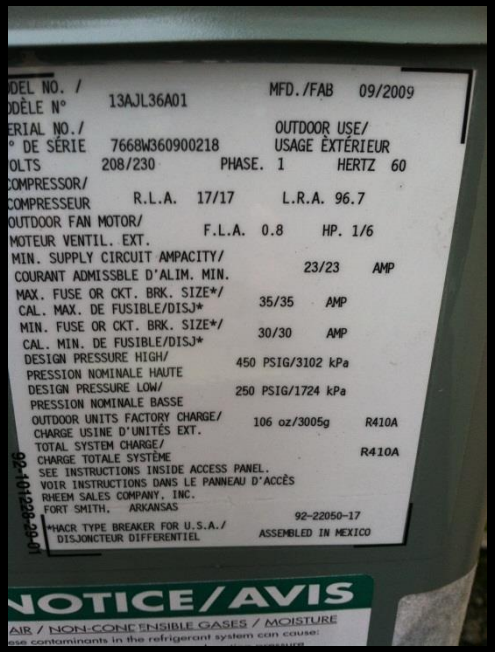
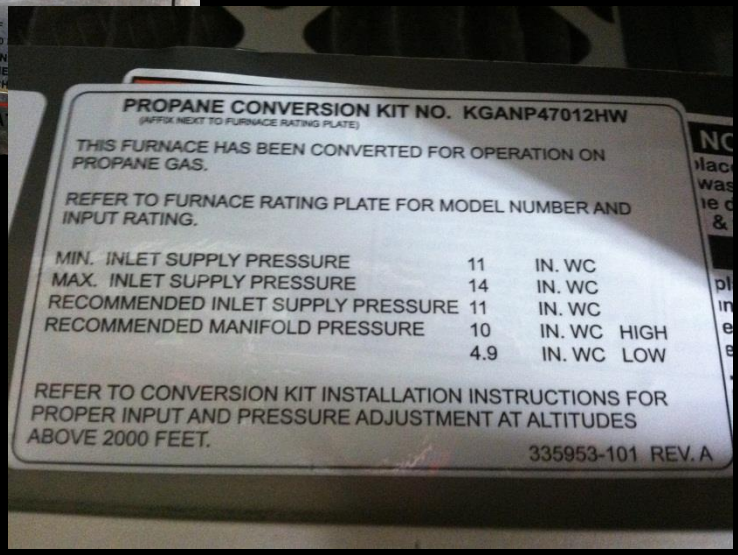
Heating, Ventilation and Air Conditioning

- Nameplates - Make, Model and Serial Numbers





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Heating, Ventilation and Air Conditioning

- HVAC Distribution Systems

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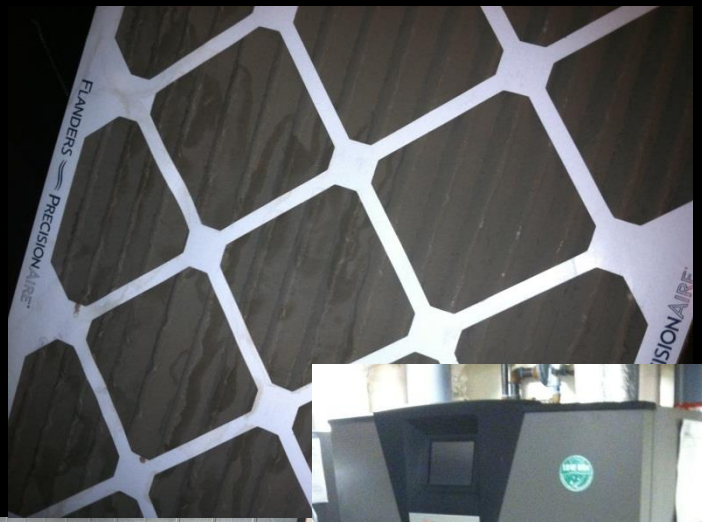
Heating, Ventilation and Air Conditioning

- General Conditions



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Domestic Hot Water (DHW)

- Type
- Nameplate Information
- Configuration
  - Pumps
  - Timers
  - Flue Gas Venting
    - CO
    - Spillage
    - Backdrafting
- Distribution
- General Conditions

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Lighting

- Type
- Power Rating
- Controls
  - Occupancy Sensors
  - Photocells
  - Timers
- Efficacy

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Plug Loads

- Office Equipment
- Personal Computers
- Coffee Makers
- Refrigerators
- Personal Space Heaters
- Vending Machines

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Process Loads

- Commercial Refrigeration
- Pumps
- Compressors
- Computer Network Servers





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Energy Efficiency Feasibility Study (EEFS)

- Conducted Energy Efficiency Workgroup meeting on March 4, 2013 to discuss initial findings and to develop criteria for prioritizing energy conservation measures

Summary of Findings – Building Performance

• The interaction of all of the building systems integrated into a “building as a system”.
• Often Health & Safety issues are indications of poor building performance.

• Addressing building performance issues will have positive affects on both energy efficiency and work productivity.

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Energy Conservation Measures

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Energy Conservation Measures

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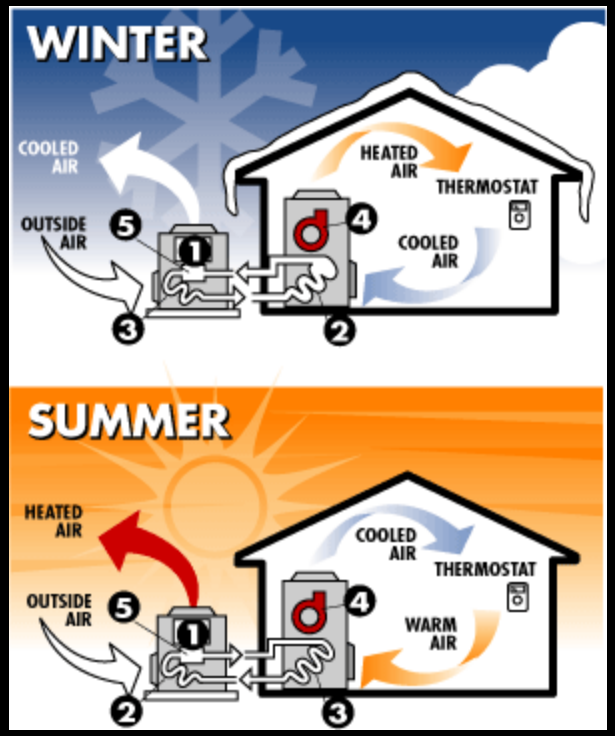
Energy Conservation Measures



CATALYST
Efficiency Enhancing Controller
Patent Pending

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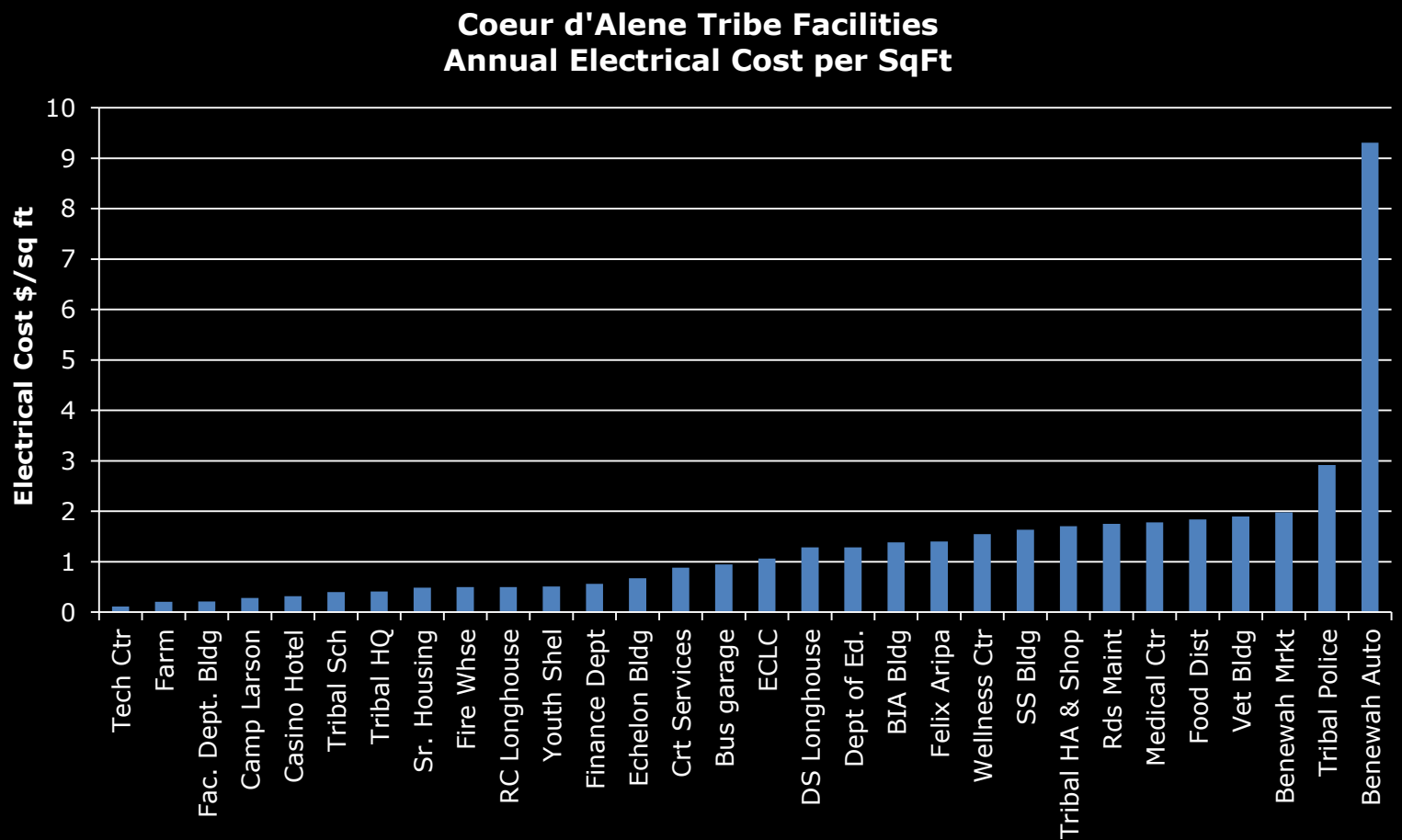
Energy Use Analysis Summary



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McKinstry For The Life Of Your Building

Energy Efficiency Feasibility Study (EEFS)

- Completed Draft Energy Efficiency Feasibility Study
- Conducted Energy Efficiency Workgroup meeting on December 3, 2013 to discuss draft Energy Efficiency Feasibility Study

EEFS Outline

- Summarize Draft Energy Efficiency Feasibility Study
  - Initial Findings Report
  - Utility Billing Analyses
  - ECM Prioritization Report
    - Building Prioritization across Portfolio
    - Individual Building ECM Prioritization
      - Methodology
      - Examples
    - Resources and Strategies for ECM Implementation
      - Funding Sources
      - Administrative Strategies
- EPA Portfolio Manager Update

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Energy Efficiency Feasibility Study

- Report Format
  - 6 Main Sections
    - Executive Summary
    - Field Energy Assessment Initial Findings Report
    - Utility Billing Analyses Report
    - Energy Conservation Measures Prioritization Report
    - Potential Funding Sources and Strategies for ECM Implementation
    - Appendices

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Initial Findings Report

- Building Envelope
- Heating Ventilation and Air Conditioning
- Lighting Systems
- Domestic Hot Water
- Plug and Process Loads

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Initial Findings Report

Tribal Housing Authority Office and Shop	HVAC	• Complete duct leak testing and repair seams with fiberglass tape and mastic • At end of serviceable life replace Rheem air conditioner with Energy Star rated air source heat pump • Perform regular quarterly HVAC filter changes on all systems • Set programmable thermostats to better reflect actual occupancy patterns at appropriate energy efficient temperature set points and setbacks • Evaluate Rheem condenser coils for signs of freezing or other deterioration due to air handler mismatch • Install timer switch on electric resistance heater in Shop Area.
	Lighting	• Upgrade T12 linear fluorescent lighting to T8 lighting • Replace incandescent flood lighting with CFL equivalent • Install lighting occupancy sensors in restrooms and offices.
	DHW	• Insulate hot water pipes and cold water inlet pipe to 6' from tank
	Plug loads	• Replace refrigerator with Energy Star rated equivalent • Install Vending Miser on vending machine

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Utility Billing Analyses Report

- Energy Use Index (EUI)
- Benchmarking
- Monthly Energy Consumption Profile
- Energy Rate Analyses
    - Summary of Utility Data Anomalies

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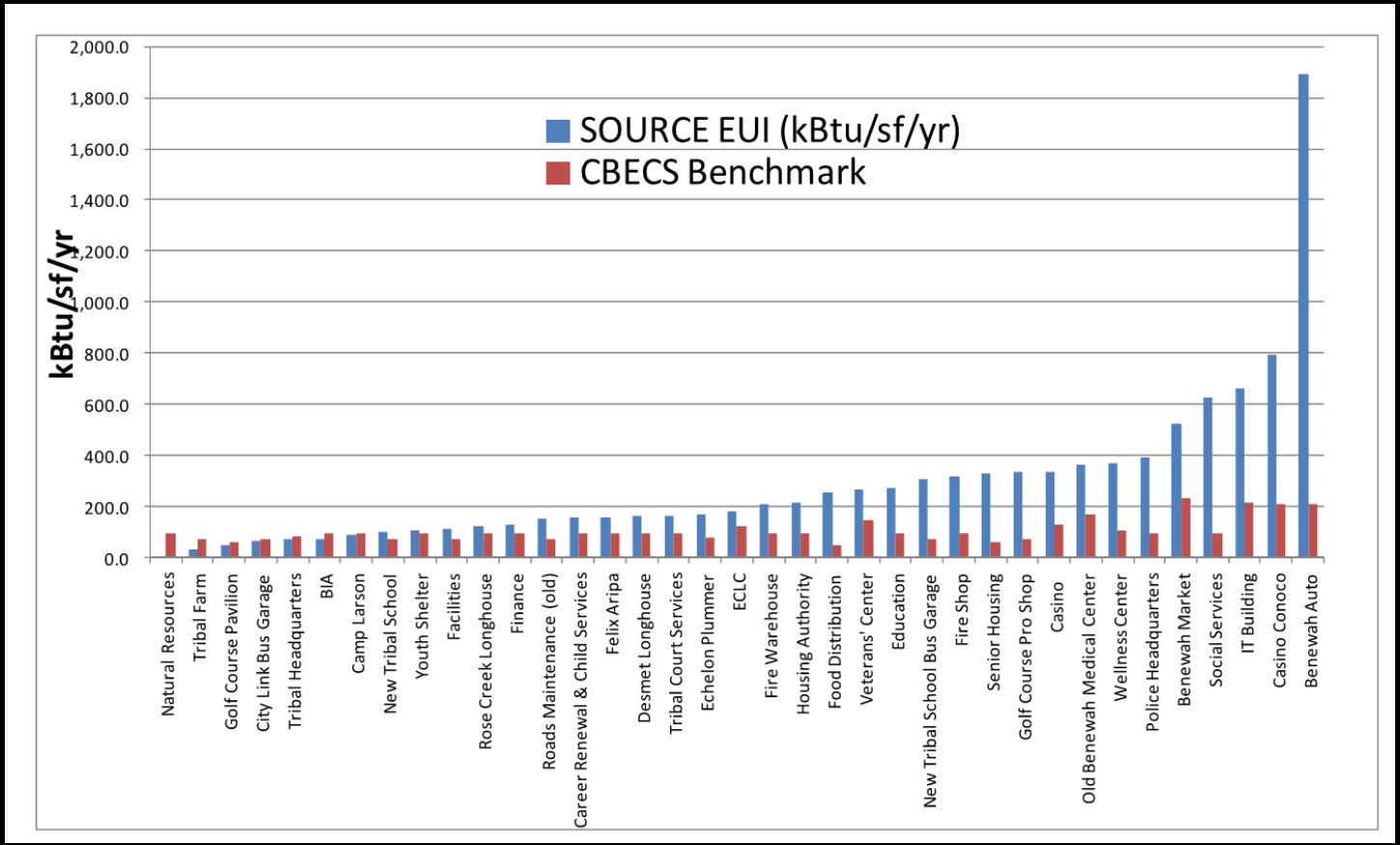
Utility Billing Analyses Report



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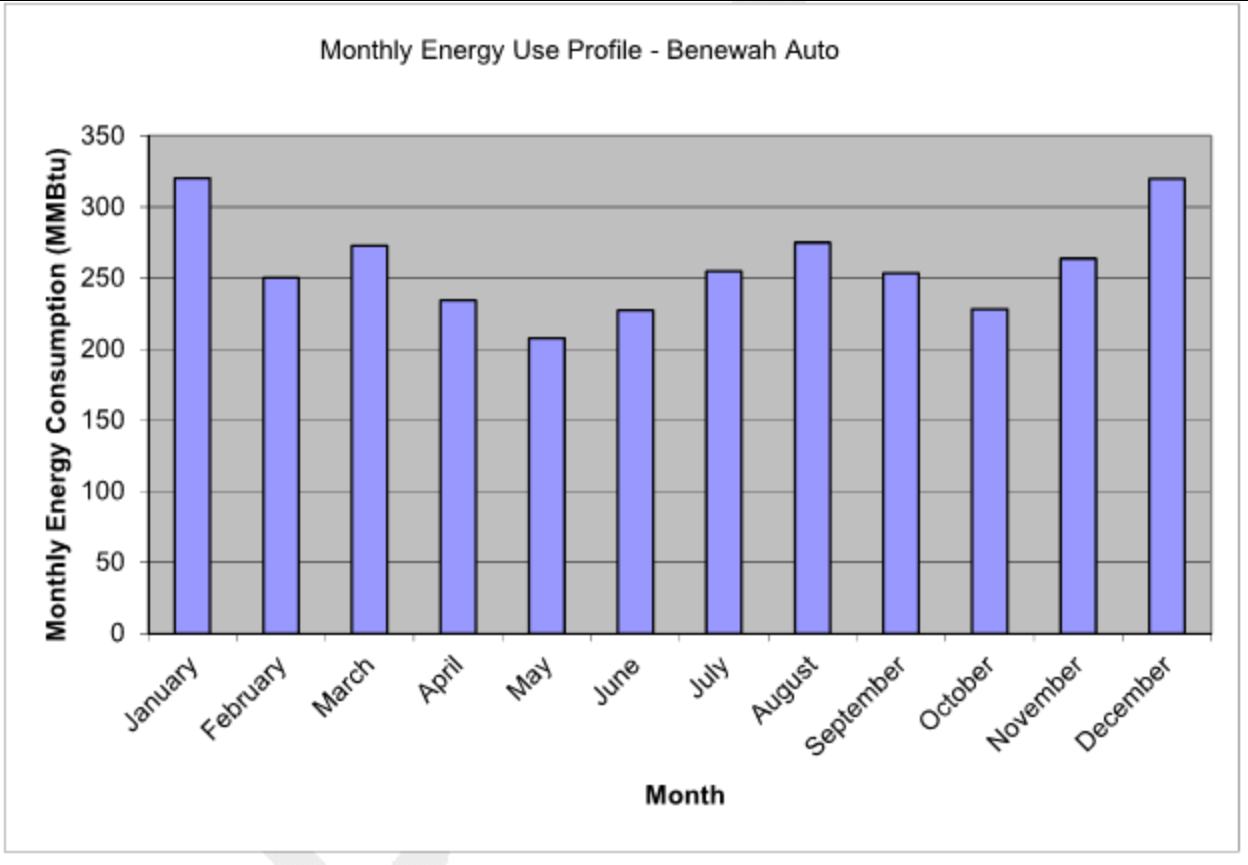
Utility Billing Analyses Report



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Utility Billing Analyses Report

- Example Utility Data Anomaly
  - Benewah Auto
    - EUI inordinately high
    - Evaluation of meter indicated that there was a possible multiplier error.
    - Recommended utility verification of meter
  - Result – Multiplier error was determined and the Tribe was credited by the utility.

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ECM Prioritization Report

- Building Prioritization across Tribal Portfolio presented in three formats
  - Annual Energy Cost Savings
    - For example, if the Tribe implemented all Energy Conservation Measures in all 35 buildings, the Tribe could save 7,959,588 kBtu/year and that would equal $167,305 per year at a cost of $1,200,458
  - Annual Energy Savings
  - Internal Rate of Return
- Individual Building Energy Conservation Measure (ECM) Ranking

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Individual Building ECM Ranking Process

- Economic Evaluation of Proposed ECMs
- ECM Ranking
    - Weighted Criteria
        - Routine Building O&M Requirement
        - Energy Savings Potential
        - Internal Rate of Return
        - Technical Feasibility

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Individual Building ECM Ranking Example
Benewah Market

Facility	Energy Conservation Measure	Net Incremental Cost ($)	Annual Energy Savings (kBtu/year)	Annual Savings ($/year)	Annual Energy Savings (%)	Simple Payback (years)	Net Present Value ($)	Internal Rate of Return (%)
Benewah Market	Complete Refrigeration System Upgrades - See Description* and Appendix D	$597,090	1,346,603	$16,065	31%	37.2	($324,922)	-4%
	Upgrade 4', 2-lamp T12 lighting in stock room to 4', 2-lamp T8	$200	7,304	$86	0.19%	2.3	$1,163	44%
	Install Vending Miser on Vending Machine	$0	1,536	$18	0.04%	0.00	$285	NA
	Pipe insulation	$150	3,993	$47	0.10%	3.2	$597	32%
	Totals	***$597,440***	***1,359,435***	***$16,215***	***31%***	***36.8***	***($322,877)***	***-4%***

Benewah Market and Offices	**Routine Buildng O&M Requirement**	**Energy Savings Potential**	**Internal Rate of Return**	**Feasibility**	**Overall Score**
Weighting Factor	25%	25%	25%	25%	100%
Complete refrigeration system upgrades	9	9	2	5	6.3
Vending Misers	1	1	10	10	5.5
Upgrade T12 lighting to T8	4	2	5	8	4.8
Hot water pipe insulation	4	2	4	8	4.5

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Renewable Energy Opportunities

- Solar Energy
  - 5.1 Peak Sun Hours per day
  - Current economics are difficult
  - Use as backup or emergency power
- Biomass
  - Existing studies inadequate to assess.
  - OE recommends further inventory of both wood and agricultural residues
- Wind Power
  - Must be evaluated in a site specific manner.
  - CDA contacted by TWN Wind Power, a Tribally-owned wind power development company.

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Resources and Strategies for ECM Implementation

- Funding Sources
  - Utility Rebate Programs (deemed and custom incentives)
  - Non-Profit Grant Programs
    - Bonneville Environmental Foundation, Solar 4R Schools
  - State Bond Programs (renewable energy projects)
  - State Loan Program – Low interest loans for energy efficiency projects (4% with 5 year terms)
  - Department of Energy - Tribal Energy Program
  - USDA Rural Energy for America Program (REAP) – Grants up to 25% of the eligible project costs ($500,000 for renewable energy, $250,000 for energy efficiency)

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Resources and Strategies for ECM Implementation

- Internal Policies and Strategies
    - Develop internal systems or policies to:
        - Reserve energy savings from one project fund the next project
        - Return cost of implementing ECM project to responsible parties out of energy cost savings pool.
        - Allow building operators and managers the opportunity to see energy usage billing data so they can take “ownership” of energy usage and potential savings.
            - Incentivize energy savings for departments and responsible managers.
            - Maintain EPA Portfolio Manager
        - Convene the EE Workgroup to “check-in” on energy issues and opportunities.

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Next Steps for EEFS

- Finalize the draft Energy Efficiency Feasibility Study (EEFS)
- Request Tribal Council approval of the EEFS
- Submit final EEFS to Department of Energy
- Implement Energy Efficiency Feasibility Study

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Lessons Learned

- Saving energy seems so simple and logical but can be challenging to implement due to habits, institutional barriers and limited funding

- Securing energy incentives from utilities can be challenging due to timing of a project not aligning with incentives schedules, competition for incentive funding and other complications

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Benewah Market Energy Efficiency Project

• The Tribe's Natural Resource Department and the Tribal Development Corporation teamed up to apply for and is in the process of being awarded a U.S. Department of Energy, Tribal Renewable Energy and Energy Efficiency Deployment Assistance grant opportunity to increase energy efficiency in the Tribe's Benewah Market in Plummer, Idaho

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Creating the “New” Benewah Market

- Store Remodel
  - Deli Remodel & Added Services
  - Produce Remodel
  - Repaint & Brand the Benewah Market
  - New Outdoor Sign with Digital Reader board
  - Landscaping & Native Artwork
  - New Cases and Freezers

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Deli Remodel

- New Counters, Repaint w/ laminate paneling & Flooring

Produce Department Remodel

- New Product Signs & Mirrors for Produce Cases
- Moved Isles and Products to open up Produce Dept
- New Flooring & Dry Tables

Repaint & Rebrand

Outdoor Digital Sign & Artwork

- Native American Artist – Smoker Marchand

Produce Department Remodel

- New Product Signs & Mirrors for Produce Cases
- Moved Isles and Products to open up Produce Dept
- New Flooring & Dry Tables

New Cases & Freezers

- Projected Annual Minimum Savings
  - $16,000
- Difficult to Quantify what this will do to Sales
- Perception of the overall store
- Improvement in Food Quality
- Tribal Pride in Store
- Community Support & Appreciation

Contact Information

- If you would like more information or to discuss anything further, please contact:
- Tiffany Allgood, Environmental Action Plan Coordinator, at (208) 686-8802, tallgood@cdatribe-nsn.gov or
- James Alexie, Tribal Development Corporation CEO, at (208) 686-1948, jalexie@cdatribe-nsn.gov
- Thank you for your time today.