



Yurok Tribe

Tribal Utility Feasibility Study & Human Capacity Building in Energy Efficiency and Renewable Energy System Maintenance



Presented By:

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and Jim Zoellick, Schatz Energy Research Center



Projects Goals & Objectives



Long-Term Goals:

- Increase energy self-sufficiency and create energy related employment and economic development on the Reservation

Near-Term Objectives:

- Identify and meet key energy needs on Reservation
- Establish Tribal energy program
- Develop energy expertise within Tribal staff
- Increase community understanding of energy issues
- Identify available funding and resources to support Tribal energy program
- Assess available renewable energy resources
- Develop plans for Tribal utility (energy services and renewable energy)



Location





Background

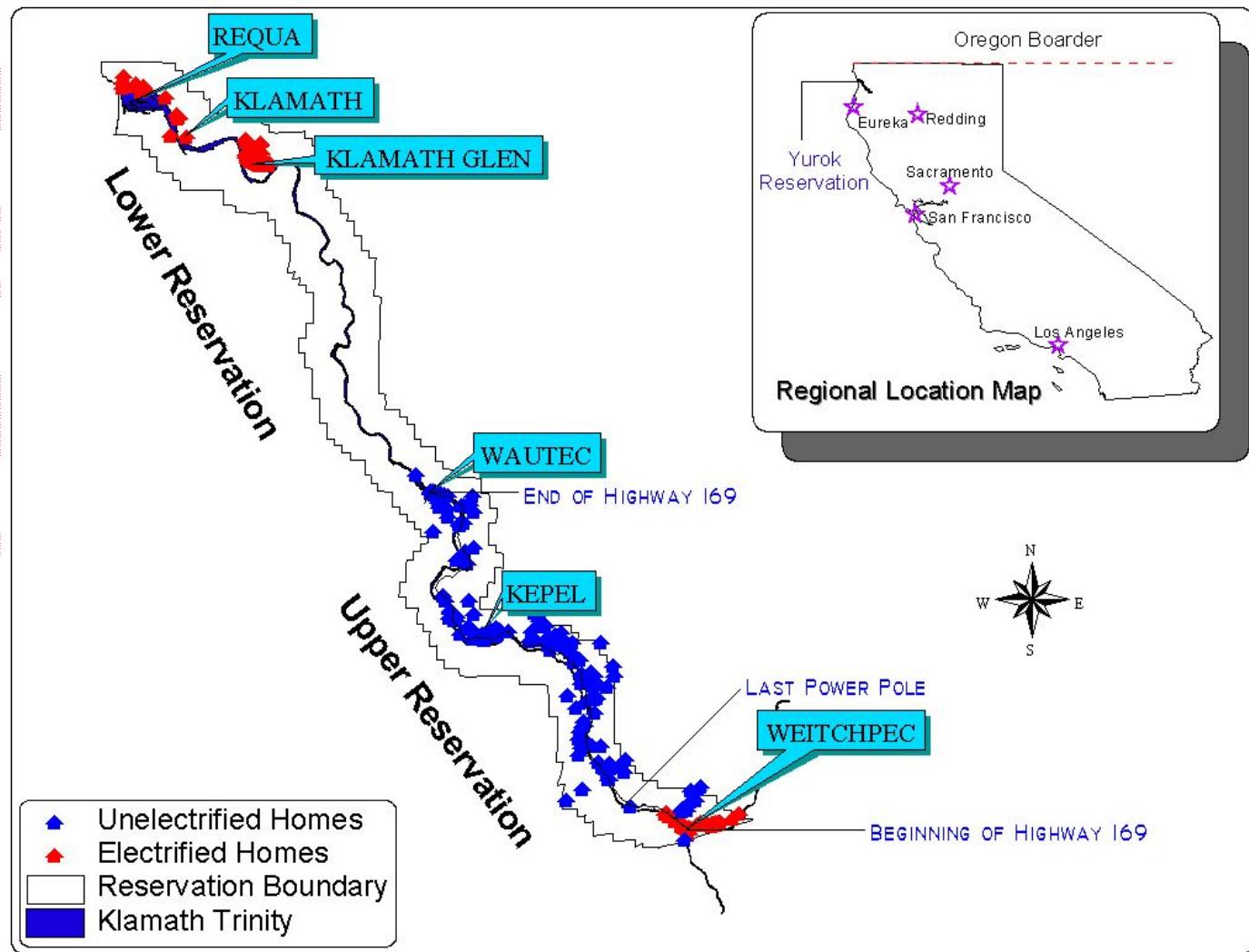


- Historically 70% of residents on the Yurok Reservation have not had convenient access to power or phone.
- Renewable energy power systems have been installed in the past that have not endured due to lack of proper use and maintenance.
- The Yurok Reservation straddles two counties and is located in the most remote corners of two utility companies' service territories (PP&L and PG&E). Energy service programs are not readily accessible.
- Yurok Tribe members suffer from high energy cost to income ratios: a recent survey indicates 44% of residents' income is spent on energy.





Background





RUS Power Line Extension

- Approximately 30 miles of 12.5kV power lines are currently being installed at a cost of roughly \$150,000 per mile.
- This line extension will provide grid power to ~130 homes on the reservation.
- Upon completion, ~30 residences will remain without grid-connected electrical power.





Tribal Utility Feasibility Study



- Establishment of a Tribal Utility would require ownership and control of the electrical grid.
- Tribe is financing the grid extension, but is transferring ownership to PG&E due to cost of separate easements, cost of maintenance, and inability of Tribe to “wheel” power due to capacity of line.





Tribal Utility Feasibility Study

Establishing a conventional Tribal electric utility is not economically viable because the Tribe's household electric service base is too small (130 households).



Tribal Utility Feasibility Study



Alternative Tribal utility models are being explored.

Project tasks are:

- Conduct inventory of renewable energy (RE) resources
- Develop plan to make RE available, maintenance plan
- Develop plan to provide energy efficiency services
- Investigate opportunities to aggregate load for bulk power purchase
- Research economic development opportunities for RE
- Develop energy service billing plan
- Determine steps to integrate energy services into existing Tribal utilities district
- Investigate funding and financing resources





Tribal Utility Feasibility Study

Inventory of Renewable Energy Resources

The following reports have been collected and are being reviewed:

- *Preliminary Feasibility Study for a Biomass Utilization Project on the Yurok Reservation*, TSS Consultants, March 31, 2003.
- *Phase I Report on Renewable Energy Options for the Yurok Indian Reservation*, Sandia National Laboratories, 2000.
- *Community Context and Technology Options in the Yurok Tribal Electrification Project*, Master's Project, Christopher Greacen, University of California, Berkeley, May 1987
- Assessment of Capell and Pecwan Hydroelectric Projects, Humboldt Engineering
- Alternative Energy Project Reports, Kelso Starrs and Associates, 1998-1999

**Phase I Report on
Renewable Energy Options
for the
Yurok Indian Reservation**

Prepared by
Roger Hill and Mike Thomas, Sandia National Laboratories
Ben Rinehart, Idaho National Engineering and Environmental Laboratory
Randy Marion, Western Area Power Administration

Name of Site: Yurok Indian Reservation, California
Date of Survey: June 27-28, 2000
Contact: Peggy O'Neill, Planning Director; John Miller, Planner
Location: Approximately 30 miles North and East of Eureka California

Major Topics
Yurok Request for Assistance
Background, Resources, and Issues
Tribal Goals
Observations and Findings
Analysis
Site-Specific Recommendations
Renewable Energy Policy
Summary





Tribal Utility Feasibility Study

GIS energy database under development



Biomass	Microhydro	Solar	Wind	Electric Demand
Treatment of mill waste	Stream location	Existing solar electric systems	Wind resource availability	Commercial demand
Forest fuel reduction efforts	Stream gradient	Potential sites for new PV systems	Available ridgeline terrain	Residential demand
Vegetation type	Stream flow	Potential sites for village scale solar	Land ownership	
Vegetation density	Fish habitat	Solar energy resource availability	Existing roads	
Land ownership	Cultural sites		Terrain slope	
Existing roads	Land ownership		Vegetation type	
Terrain slope			Vegetation density	
Mill location			Cultural sites	
Mill ownership				



Tribal Utility Feasibility Study



Work plan for coming months:

- Complete renewable resource inventory
- Collect data for GIS database
- Develop plan for making renewable energy systems available on the Reservation
- Develop plan for providing maintenance and repair to existing renewable energy systems
- Develop plan for providing energy efficiency services on the Reservation
- Develop plan for billing for energy services
- Investigate opportunities for aggregating customer load



NREL/DOE



Human Capacity Building Project



Project Team

Yurok Tribe:

Dustin Jolley – Tribal Engineer



Georgiana Myers – Energy Specialist



Stephen Kullmann – Energy Technician



Schatz Energy Research Center:
Jim Zoellick – Sr. Research Engineer
Richard Engel – Research Engineer



Human Capacity Building Project Tasks

- Task 1: Conduct Staff Energy Training
- Task 2: Conduct Energy Efficiency and Renewable Energy Workshops
- Task 3: Perform Energy Efficiency and Renewable Energy Needs Assessment
- Task 4: Identify Energy Program and Funding Resources
- Task 5: Develop Energy Program Strategy
- Task 6: Conduct Community Energy Education Campaign
- Task 7: Monitor and Document Project Accomplishments



Human Capacity Building Project



1st Quarterly staff training

- Discussed DOE funded projects
- Examined energy issues, built awareness
- Discussed energy efficiency and renewable energy opportunities on the Reservation

2nd Quarterly staff training

- Conducted round-table discussion
- Asked Tribal staff for their input regarding Tribal energy needs, role of the Tribal energy program, field work issues, resources, and opportunities





Human Capacity Building Project

Energy Advisory Committee

- Includes local utilities, Tribes, weatherization agencies, and regional energy authority
- Held first meeting
- Provided background information on project
- Asked for input on: energy needs, available resources, recommendations, collaboration opportunities





Human Capacity Building Project

Two week long energy trainings

Energy Efficiency



Building energy systems
Energy use, efficiency, and auditing

Renewable Energy



PV, Solar Water Heating, Micro-hydro





Human Capacity Building Project

Residential Energy Audits



- Assess Energy Uses and Needs
- Highlight Areas for Potential Energy Savings
- Distribute High Efficiency Compact Fluorescent Bulbs and Water Heater Blankets
- Assess Renewable Energy Potential (Micro-hydro, PV)
- Assess Performance of Existing Off-Grid Systems
- Assess Electrical Systems and Readiness for Grid Connection
- Check for Other Health & Safety Concerns





Human Capacity Building Project

Residential Energy Audit Statistics



Total audits:	41
Total occupants:	107
Elders:	22
Children:	32
Disabled:	6
Renewable energy:	11
Utility power:	19
PG&E:	17
PP&L:	2
Off-grid:	22
Site built:	29
Modular/mobile:	12



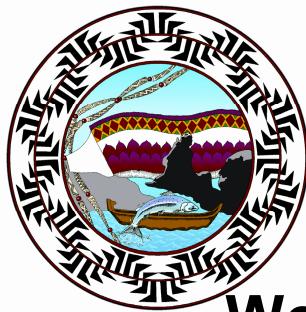
Human Capacity Building Project



Residential Energy Audits - Services and Referrals

- Minor RE system repairs (bad wiring, incorrect wiring)
- Referrals for electric bill rate reduction
- Referrals for weatherization services & CARE program
- Referrals to Housing Dept. for handicap bars
- Referrals to Social Services
- Provide information on safe generator operation





Human Capacity Building Project

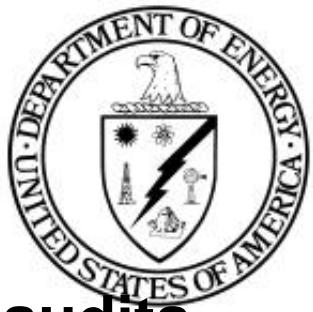
Weitchpec and Klamath Tribal facility energy audits

- Insulation
- HVAC
- Lighting
- Appliances & computers
- Staff energy habits



Weitchpec

Klamath





Human Capacity Building Project

Education and Outreach

Energy Education Pamphlets

- Heating Efficiently with Wood
- Maintaining Renewable Energy Systems
- Generator Safety
- Reducing Household Energy Costs
- Efficient Lighting
- Simple Weatherization
- Phantom Loads

School Outreach

- Jack Norton School, Pecwan
- Weitchpec School, Weitchpec
- Margaret Keating School, Klamath



Margaret Keating School



Human Capacity Building Project

Work Plan for Coming Months



- Complete additional energy audits (100 targeted)
- Analyze data, develop needs assessment
- Collect and make referrals to county agencies for weatherization services
- Conduct two more staff trainings (discuss Tribal office energy audit results)
- Set up displays for energy education brochures
- Run energy education ads in Tribal newsletter
- Hold community energy education events
- Perform energy outreach to schools
- Conduct funding/resources search
- Hold 2nd advisory committee meeting
- Develop on-going energy program strategy
- Document project results, prepare final report