Ramona Band of Cahuilla Indians

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Ramona Tribe – Overview

- FIRST RESERVATION TO BE COMPLETELY OFF GRID
- ISSUES THE TRIBE FACES:
  - REMOTE AND RURAL
  - LAND LOCKED
  - UTILITY COSTS ARE PROHIBITIVE
- ECO-TOURISM PROJECT
- HOUSING UNITS
RAMONA LOCATION
• Macro Grid Hybrid Power System: Eco-Tourism
• Micro Grid Hybrid Power System: Housing Units
RAMONA ECO-TOURISM PROJECT

OBJECTIVE

• TO PROVIDE POWER TO THE TRIBE’S ECOTOURISM BUSINESS VIA ALTERNATIVE ENERGY TECHNOLOGIES

• PROTECTION AND PRESERVATION OF CULTURE AND HERITAGE
Design of Eco-Resort
PROJECT PARTICIPANTS

• AGENCIES

RAMONA BAND OF CAHUILLA – SUPPLEMENTAL FUNDING
DOE – ECOTOURISM POWER
HUD CDBG – ECOLODGE
USDA RD - ECOTENTS
BOR – ECOTOURISM WATER
U.S. FOREST SERVICE – ROAD ACCESS
Macro-Grid Hybrid Power System

- 10kw Photovoltaic Array
- VRLA (Value Regulated Lead Acid) Battery Banks
- 15kVA continuous inverter with 175A disconnect
- 60kw 3 Phase Diesel Generator
- Power Station Building 12’ x 16’
- Monitoring System, Inverter, Breaker Box, Wiring, etc.
60 Module Solar Array: 175w operating at 100 volts DC

Total of 10,500w

Feed two inverter banks
  - Main Lodge System
  - Ecotents

SOLAR PANELS – SIDE VIEW
POWER BUILDING FRONT VIEW
ABSOLYTE IIP BATTERIES

• Battery Output: 10,800 Ah at 48 volts
• Life Capacity: up to 20 years
• Weight: 300 lbs per unit
OUTBACK INVERTERS/CHARGERS

- 36 Kw Inverters
- 120/240 Volts
KOHLER 60HZ GENERATOR

- 60Kw 3 Phase Generator
COMPLETED ECOTENTS
ECOTENT SKYLIGHT OPENING
COMPLETED SKYLIGHT OPENING
VIEW INSIDE OF ECOTENTS
TECHNICAL/MANAGEMENT ISSUES

• COORDINATION OF MULTI-AGENCIES WHICH SLOWS PROJECT PROGRESS

• ENVIRONMENTAL RESTRICTIONS

Need to coordinate with environmental departments to ensure all requirements are met prior to start of project.
ACTIVITIES REMAINING

- EXTEND LINES TO THE WATER SYSTEM
- CONSTRUCT ECOLODGE (RESTAURANT, EDUCATION CENTER, CONFERENCE CENTER, OFFICES, RESERVATION OFFICE, GIFT SHOP, ETC.)
- EXTEND LINES TO THE ECOLODGE WHEN COMPLETE
Housing Complex: Micro-Grid Hybrid System

• 2Kw wind turbine capacity with wireless controls
• 6.3Kw large photovoltaic modular array
• VRLA (Value Regulated Lead Acid) battery banks
• 25Kw propane generator
• Propane storage tank
• Currently installing Data Loggers
Southwest Wind Power
Skystream 3.7 Wireless Model
Wind Turbine and Solar Cells for Housing Complex producing 8.3 Kw
Power House (includes back-up propane generator, battery bank, and inverters/chargers)
FUTURE PLANS

• COMPLETE CONSTRUCTION FOR POWER SUPPLY
• BUILD OUT OF THE ECOTOURISM DESTINATION RESORT INCLUDING ACQUIRING ADDITIONAL FINANCING
• DEVELOP ECOTOURISM PROGRAMS
  ALTERNATIVE ENERGY EDUCATION
  CULTURAL – LANGUAGE, BASKETRY, & POTTERY
  HERBOLOGY
  PARTNERSHIP WITH U.S. FOREST SERVICE AND BLM
• TRAIN TRIBAL MEMBERS AND STAFF FOR LONG TERM O/M OF THE POWER SYSTEMS
• CONTINUE TO BE SELF SUFFICIENT