Feasibility Study for the Formation of a Renewable Energy Tribal Utility

Viejas Tribal Government

DOE EERE Tribal Energy Program Review Meeting

October 20, 2004
Presenter

Mike Elenbaas
Energy Consultant
Black & Veatch
11401 Lamar Avenue
Overland Park, KS 66211
(913) 458-9196
elenbaas@bv.com
Project Objective

- Investigate the feasibility of forming a renewable energy based tribal utility for the Viejas Tribe.
Overview

- 30 miles east of San Diego
- 1600 acres
- Business enterprises:
  - Gaming
  - Outlet Center
  - Ma Tar Awa RV Parks
  - Alpine Springs Park

Government Structures
- General Council
- Tribal Council
- Community Gymnasium
- Education Center
- Fire Station
- Senior Citizen Center

Project Location
Project Participants

- Viejas Tribal Government
- Black & Veatch Corporation
- Legal Opinion
The Tribe Has Several Concerns Regarding Energy Supply

- Electric Rates (Price and Stability)
- Electricity Reliability
- Energy Independence
- Local Control
- Environmental Impacts

Viejas and Black & Veatch Have Cooperated on Energy Investigations Since 2001

Conclusions of Previous Work:

- Largest costs and risks involved with forming a utility are associated with:
  - Procurement of electricity from the volatile California energy market
  - Transmission of purchased power to the reservation

- *Local renewable energy resources could address these issues*

Historical Price Volatility:
Project Tasks

- Renewable Energy Resources and Technology Assessment
  - Wind
  - Biogas
  - Biodiesel
  - Solar
- Detailed Reservation Load Profile
- Assessment of Energy Storage and Load Management Opportunities
Project Tasks (cont.)

- Electrical Interconnection Analyses
- Distribution System Audit
- Legal Analysis
- Generation Mix Optimization Study – POWRPRO™
- Environmental Analysis
- Tribal Benefit Assessment
- Economic Assessment
- Business Plan Development

Project Approach Flowchart

1. Project Kickoff Meeting
2. Renewable Energy Resources and Technology Assessment
3. Detailed Reservation Load Profile
4. Assessment of Energy Storage and Load Management Opportunities
5. Electrical Interconnection Analyses
6. Distribution System Audit
7. Legal Analysis
8. Generation Mix Optimization Study
9. Environmental Assessment
10. Tribal Benefit Assessment
11. Economic Assessment
12. Business Plan Development
13. Participate in Tribal Energy Program Review Meeting
Project Status

- Wind monitoring towers installed in March 2004
  - Wind Data collected on a monthly basis
  - Data Analysis performed quarterly
- Detailed Reservation Load Profile Analysis Complete
- Draft Renewable Energy Resources Technology Assessment Complete
- Generation Mix Optimization Study and other tasks in Progress
Areas of Wind Resource
Wind Anemometer Sites
Wind Data Collected and Analyzed

Wind Direction Rose: M68 Master at 20m

Wind Speed Distribution: M68 Master at 20m

Sector: All
A: 3.0 m/s
K: 1.29
U: 2.8 m/s
P: 56 W/m²

Monthly Average Wind Speeds – 70 m

- M68 Master
- M68 Casino
Master Site Frequency Distribution and Power Curve Analysis

Viejas Renewable Energy Utility Study
Master Tower Frequency Distribution and NM54 Power Curve

Net Generation: 0.57 GWh
6.8% Capacity Factor
Average Daily Load Profile of Large Loads on Reservation
Future Plans

- Generation Mix Optimization Study is being developed using wind data collected to-date, and will be finalized after completion of full year of data collection.

- Tasks 4-7 and 9-11 are in progress and will be completed and finalized in the coming months.

- Project expected to be completed, May 2005.
Conclusion

Discussion