



Small village systems - Villa Las Araucarias



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• Villa Las Araucarias

- **Inland community on the coastal range**
- **Mainly supported by forest industry**
- **Health post, school and 17 homes**
- **Community very prosperous and growing**
- **9.8 kWh daily load with a 1.2 kW peak estimated.**
- **Average wind speed of 4.8 m/s**

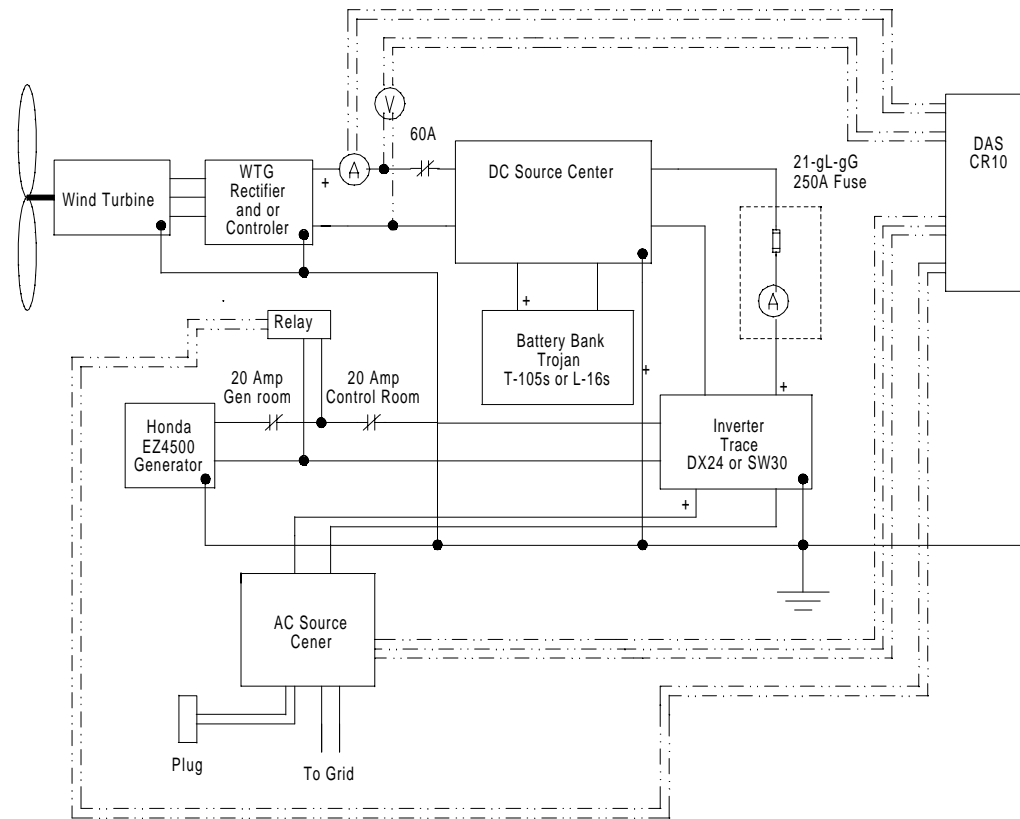
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Villa Las Araucarias





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Basic System Design





Power System Components

- **Bergey Windpower Excel 10kW wind turbine**
 - **33.6 kWh battery bank of Trojan L-16's**
 - **Trace Engineering SE3024E inverter**
 - **Honda EM4500S 5.4 kW auto-start gasoline generator**
 - **48 Volt DC bus with no DC loads**
 - **220 V, 50 Hz AC distribution on a 0.91 km grid**
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Positive Aspects

- **System has worked well from the technical side**
- **Most problems are of a social nature**
 - Utility
 - local operators
- **Problems can be solved**
- **Utility is pursuing technology in other areas**



Technical Problems - Specific

- **Lightning strike(?) knocked out equipment - Inverter and turbine**
 - Grounding enhancement's
- **Inverter repair problems (delay)**
- **Battery charging irregularities**
- **Repeated system downtime due to local system manipulation**



Technical Problems - General

- **Access to spare parts/repair**
- **Inadequate manuals -**
 - troubleshooting
 - languages
- **Equipment design for sustainability**
- **Poor communications with sites**



Social Problems

- **System service and repair**
 - Utility is reactive not proactive
 - Turnover of key utility personnel
 - Conflicts between utility branches (Engineering verses Operations)
- **Local operators**
 - Systems treated like fiefdoms
 - No apparent understanding of operation





Current Status

- **System operational**
- **Renewed support from Utility**
 - Regular general maintenance
 - Local support of system
 - Understanding of support requirements
- **DAS system operational**
- **Equipment working properly**