



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**

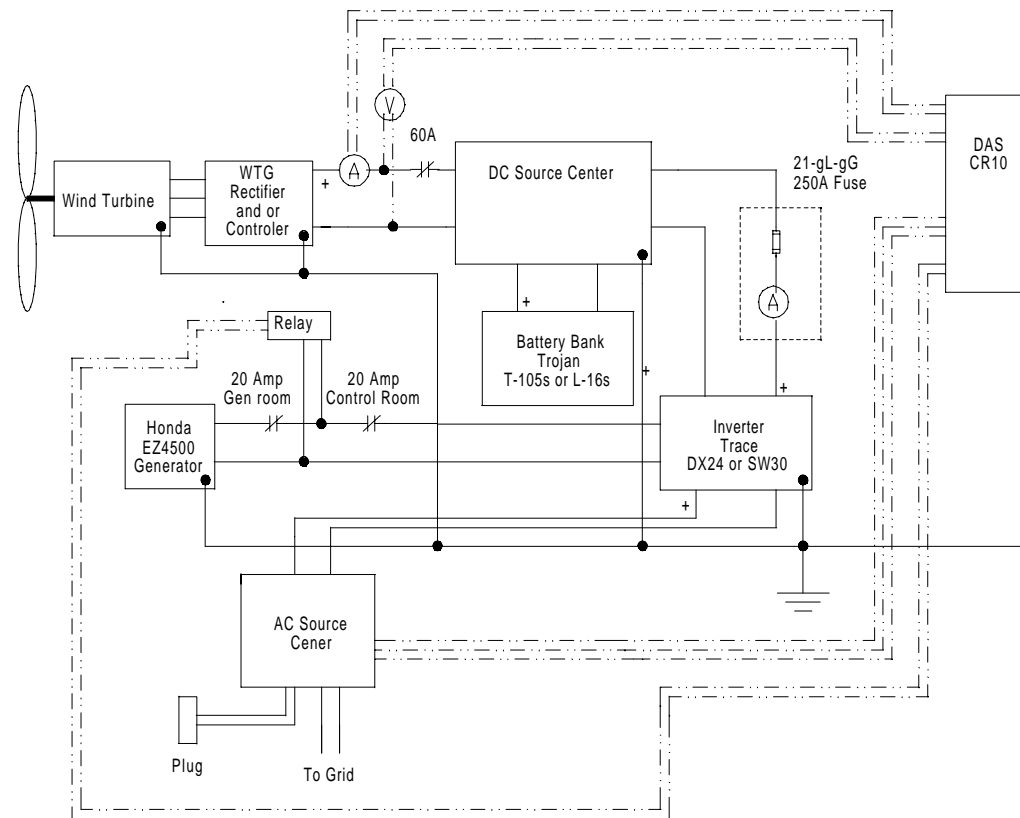
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# Villa Las Araucarias





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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**