

Alto Baguales - Coyhaique



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for
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Coyaique

Large regional center in Southern Chile



Power System

- Power Company: Edelayesen
- Parent Co: SAESA / PSEG
- 2001 Statistics
 - 18,703 People
 - 13.75 MW Peak
 - 77.6 GWh production
 - 12-14% annual growth
- Wind: 2 MW
- Hydro: 4.6 MW
- Diesel: 16.9 MW



Wind System

- Three Vestas 660's
- Installed on the ridge to the West of town
- Investment cost 1.300 US\$/kW (turn-key cost)
- Expected output 8.5 - 9.5 GWh/year
- Max daily penetration 22% (jan-may 2002)
- Capacity Factor, over 50%



Current Operation

- Node Price of power: marginal cost of generation
 - All the energy generated (wind, diesel, hydro) is sold at Node Price
 - Diesel: \$0,0563 /kWh
 - Wind: \$0.058 to \$0.06 /kWh
 - Expected long term: \$0.055 / kWh
- Basic Operation
 - Hydro
 - Wind (with periodic curtailment)
 - Diesel



Controlled from the diesel plant



W/D Project Development Process

- Project Development
 - Project Inaugurated in November of 2001
 - Initial Investigation in June of 1999
 - Wind Resource Assessment Started in 1999
 - Project RFP developed in Fall of 2000
 - Construction started early 2001
- Project Financing
 - Project was financed internally by Copec (SAESA's former parent company)
 - Decision was based on the wind resource and the price calculation compared against the diesel price.



Project Implementation

- “One of the most difficult parts was to find the appropriate cranes. One of the crane service company had to bring one from Buenos Aires!”
- Getting the crane to the site
- Plant installed by STS, SAESA and Edelayesen under the support of Vestas.



- What could be done differently
 - Better project planning
 - Better implementation planning (crane support)

Project Operation

- Wind turbines are run remotely from the diesel plant.
- Hydro covers base load
- Wind is used when available except for times of very light loading (Sunday mornings) when one turbine is shut down to meet
- Expected annual savings of 600,000 gallons of diesel fuel
- 13 million pounds per year of CO₂



Next Steps

- 10.5 MW of Hydro will be added by April 2003
 - System will operate with hydro and wind
 - Diesel plant will likely need to operate for peaking
- SAESA / Edelayesen want to get at least a one year of operational experience before next steps.
 - More wind turbines will be added as needed, the site was planned expecting more turbines to be installed.
 - SAESA / Edelayesen is planning on retrofitting other diesel plants it has operational control over.

Recommendation for others

Where the equation:

“Good wind resource + High alternatives costs + High technology performance, has a solution, this kind of projects could be successfully for any utility.”

A good wind resource monitoring program is very important too.

The financing issue with the CO₂ mechanism could also help, but it is a slow and complicated (in spite of this, this financing could be advantageous for a big project).



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