

THE REGIONAL REPLICATION OF HYBRID POWER SYSTEMS IN RURAL CHILE

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It is now generally understood that renewable based technologies have a role in rural electrification alongside conventional technologies such as diesel and grid extension. The methods of design and implementation of remote systems has also been widely reported. However, as the consideration of renewable based hybrid systems grows in governmental channels, it becomes more important that the complete picture is known before funds are approved for larger electrification programs. It is one thing to invest in a demonstrative technology, sometimes heavily subsidized, compared to its implementation under existing partisan governmental structures.

This paper will focus on the technical and analytical analysis conducted in preparation for the Islands Regional Electrification Project in the Chiloe region of southern Chile. This project, an effort to electrify approximately 30 islands, has been under development for over three years and has included a systematic market development plan, undertaken to allow the assessment of renewable technologies on a cost competitive basis to other rural electrification options.

The paper tracks the exhaustive analytical process undertaken in the development of the Islands Project, a requirement to garner support from governmental authorities. Each of the development steps, including an initial regional resource assessment, distribution cost assessment and a detailed economic and loads assessment, will be described. In addition, as part of the project development, a pilot power system was installed on the island of Tac to allow an assessment of the specific implementation, operation and technical issues that would be involved in the development of the larger project. The information garnered from this pilot system will also be discussed in relation to the larger system replication process. A combination of all of the information obtained through the detailed analysis and field experience have been incorporated into a final effort to specify the project to a level that can be presented in a competitive request for tender. The final system designs will then be used by the regional and federal authorities to assess the resulting proposals.

The complete effort in developing a regional rural electrification plan, considering the use of wind based technologies, is unique in scope and truly a model that could be followed for similar rural electrification projects worldwide.