

WIND ENERGY FORECAST

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Summary

The participation of renewable energies in the Chile's energy matrix is rapidly increasing. In particular, wind farms connected to the Central Interconnected System (SIC) have been significantly incorporated, and the Coquimbo Region playing a leading role in this area. In the year 2015 the net installed wind power in the Coquimbo Region was 609 MW, corresponding to 65 % of the total installed capacity in the country.

It is expected that the growing energy demand leads to an increase in the installed wind power. Currently, there are more than 50 new wind projects approved, 13 of them in the Coquimbo Region. Due to the wind variability, the energy production of a wind power plant is variable and may limit the participation of this type of renewable energy in the energy matrix. Indeed, if the participation of wind energy in the SIC increases, wind variability can lead to major destabilization in the central grid.

The goal of the present project is to implement an Energy Forecasting System for a wind farm located in the Coquimbo Region. The methodology is based on Artificial Neural Networks (ANN), trained with historical data of the energy generated by the parks, meteorological variables measured, and historical weather forecasts.

Since weather forecast is important for obtaining a good energy forecast, the implementation of a validated forecast model in the Coquimbo Region is part of the project activities. Although, the methodology was applied for wind farms located in the Coquimbo Region connected to the SIC, it can be also applied to any wind farm located in other regions of Chile, whether they are connected to the central grid (SIC or the SING) or to island type wind farms that deliver energy, for example, to a mining site.

The results obtained will allow to the Centro de Despacho de Carga (CDEC) -SIC (or -SING) to take the necessary strategies to compensate the variations in the wind energy production. The potential users of the results of the project are the owners of the wind farms, the CDEC-SIC and companies that use wind energy to supply their own energy needs.

The Research and Development activities will be performed in Cooperation with the Center of Solar Energy and Hydrogen Research Baden Württemberg (ZSW), Germany, an institution with

extensive experience in energy forecast, within the framework of the project International Cooperation project between CONICYT and the German Ministry of Research and Training (BMBF).

Main Goal

To implement an Energy Forecasting System for wind farms in the Coquimbo Region

Specific Goals

- o To design, implement and validate a weather forecast system in the Coquimbo Region.
- o To generate energy forecasts of the energy produced by a wind farm, using algorithms based on ANN.

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International partner: Center of Solar Energy and Hydrogen Research (ZSW), Germany

Associated Company: Latin American Power (LAP)

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