

Case Study 2 – Cube-Engineering GmbH: Desert Project “Ras al-Kaimah”

Seven fully equipped measuring stations in an inaccessible desert region. Objectives: site development and subsequent construction of futuristic urban development project Ras al-Kaimah Eco City.

The internationally active wind consultancy firm CUBE Engineering GmbH was appointed by the national utility company of the Arabian emirate Ras al-Kaimah to evaluate the country’s wind potential and to identify potential sites for pilot projects. Ras al-Kaimah is one of seven sheikdoms of the United Emirates of Arabia (UEA). Fertile coastal regions co-exist with harsh regions, such as the Hadshar mountains, which are up to 3,000 m high and practically bare of vegetation, and the sand dunes of the extension of the Rub al-Khali desert, in the southern territories - one of the largest sand deserts of our planet.

The emirate has great potential for the use of renewable energies and ambitious plans for the future. Ras al-Kaimah Eco City is characteristic of the futuristic urban development projects for which the Emirates is known. A completely new sustainable metropolis, supplied entirely by solar energy, is planned for completion by the year 2012. The sole use of local building materials will create an urban development that sets new design standards.

It was not easy to find potential sites for wind power generation, as no references or data were available. The planned fifteen wind measurement stations were reduced to seven because of inadequate or non-existent access accessibility. Many of the remote spots were only accessible via helicopter. All measuring stations were fully equipped with Ammonit data loggers METEO-32, anemometers, wind vanes from Thies, and suitable solar panels and GSM Modems for the data transfer. The components were mounted on 50 m high lattice masts.

The geographic conditions of the region required a self-contained measurement technology to the highest standards and an especially high degree of flexibility. The measuring campaign lasted for two years. Access to the wind measurement data was achieved with the help of an online tool called “windycator”, developed by the company EOL (energie-online.de) GmbH. This program offers an automated remote enquiry function and an output protocol in the format of text documents, graphics and schedules which support and simplify the administration and visualisation of the measurement data. Ammonit will offer a similar program in early 2010 which will be available for free download from the new Ammonit website.

The measuring campaign for Ras al-Kaimah Eco City is to be completed in early 2009. In addition to the wind site assessment, CUBE Engineering GmbH has assembled a wind resources map for the emirate in co-operation with the Anemos Gesellschaft für Umweltmeteorologie mbH.

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