



Preliminary Study of the Wind Resource in Iceland

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Iceland has considerable renewable energy resources. While hydropower and geothermal power have been exploited on a significant scale, less attention has been paid to wind power. In preparation for the Nordic IceWind project, this study aims to build up a quality controlled data base of wind observations, and make a preliminary map of the wind resource. The data used come from 160 automatic weather stations distributed around Iceland, and consists of wind measurements every ten minutes. The operational period for the stations varies from 4 to 12 years, and in total there were 55 million observations to quality check (QC). In 81 stations more than 99% of the data passed QC, and in 131 stations more than 90% of the data passed QC. Most problems occurred during winter, especially in harsh climate mountain stations. The wind speeds were calculated up to 90m using a standard power law profile. The resulting data was then averaged for a cold season (Sep [U+2010] Apr) and warm season (May – Aug) and mapped. Furthermore, an idealized production curve for wind turbines was used to estimate the proportion of maximum production capacity for each season at each station. These results were then interpolated to a map which will aid in site selection. Although the data base has been completed, the analysis of the data and production of a wind atlas is ongoing. The inclusion of topographic effects, wind profile measurements and more detailed power production modeling will be further studied within the IceWind project, as well as the incorporation of wind from a reanalysis downscaled with a numerical weather prediction model (NWP) and using the RISOE Wind Atlas Analysis and Application Program (WASP) where applicable.