

PSCo Capacity Factor Maps

Introduction

A capacity factor analysis for the GE 1.5SL turbine has been accomplished by WindLogics Inc. for eastern Colorado. The WindLogics modeling system was utilized to generate wind speed data for one year at the typical turbine hub height of 80 m. The wind speeds were normalized with 15 years of National Centers for Environmental Prediction/National Center for Atmospheric Research reanalysis data to represent the long-term mean wind resource. Wind power was calculated with the manufacturer power curve for the GE 1.5SL and time-dependent air density and hourly wind speed values produced from the model. Gross and net capacity factor maps were generated from the wind power statistics.

Maps

Annual mean gross capacity factor and two variations of net capacity factor maps were created. Note that on the Net Capacity Factor by County map, the full county was used in the averaging process. Low county average values in some cases can be misleading given that parts of a county could have a considerable wind resource (e.g., Logan, Weld counties). To refine the visual interpretation of the county net capacity factor mapping, a graphic was created that displayed 50 percent of the county having the highest capacity factor. In both net capacity factor maps, for counties on the western border of the model, averaging statistics are based on only those portions of the counties shown. The gross capacity factor was reduced by 13 percent (i.e., $0.87 * \text{GCF}$) to generate the net capacity factor statistics.