PREDICTION OF THE SUITABILITY OF LOCATIONS FOR WIND FARMS USING FLEX EXPERT SYSTEM

Chukwuchekwa Ulumma Joy
Department of Mathematics
Federal University of Technology, Owerri
NIGERIA.
rejoice2k7@yahoo.com

Chukwuchekwa Nkwachukwu
Department of Electrical/Electronic
Engineering, Federal University of
Technology, Owerri
NIGERIA.

ABSTRACT

Wind-generated electricity has the ability to provide electricity to homes and businesses without causing air pollution or depleting non-renewable resources, unlike electricity generated by coal, natural gas, and oil (fossil fuels). Wind farm developments are mostly not common with the local populations and as a result, many factors have to be taken into consideration before such development can take place. This paper presents a Forward Chaining Flex knowledge-base for locating Wind Farms. Such factors as energy production, visual and sound impact for the local community, the number of wildlife species in the area and their population sizes, a geological survey to determine ground stability and a hydrological survey to show the effect of the development on local rivers and water sources, are arranged in a decision tree and consequently built into a knowledge-based system using the Flex expert system shell. Sample outputs from the developed Flex expert system show that a location might be ruled out as 'completely unsuitable', 'ideal' or a 'second best' choice.

Keywords: Wind farms, Flex knowledge-base, Expert systems, Decision tree