## Design and Modeling a Novel Transverse Flux Generator for Direct-Driven Wind Turbine

The purpose of this study is to propose a suitable generator for direct drive wind turbines which has the low weight and cost, high efficiency and simple manufacturing process. At the beginning, wind turbines are introduced and different types of them are studied. Then, requirements of the direct drive wind turbines are discussed. After that, potential places for installing the turbines are investigated. Then, different types of generators are evaluated for direct drive application and it is suggested that the transverse flux permanent magnet (TFPM) generators could be possible candidates for this application. So, different topologies of TFPMs which are proposed in literatures are studied and their advantages and disadvantages are explained. After that, a topology is proposed by the author as the main idea of this study. The topology has many advantages such as: using only one ferrite PM in each phase, good demagnetization behavior and easy manufacturing process. Design equations are extracted and the design algorithm is presented. Also, three dimensional magnetic equivalent circuit is developed for the topology which is comparable with the finite element method. After that, the designed generator is optimized using Taguchi design of experiments. At the end the machine characteristics and outputs are presented and also compared with a radial flux permanent magnet synchronous generator at the same power and speed.