Axial Flux Permanent Magnet Generator (AFPMG) Designer Documentation

2015-09-28

1 Introduction

This document describes the AFPMG Designer and the used calculations. The Designer is based on the following article: Axial Flux Permanent Magnet Generator Design for Low Cost Manufacturing of Small Wind Turbines (K.C. Latoufis) with modifications and additions.

The designer can be used to design an Axial Flux Permanent Magnet Generator (AFPMG) system. This includes the generator and the front end and back end. With front end the way the generator is driven is described. With the back end the of the generator the conversion from ac to dc, transportation and storage of energy is described.

In general an AFPMG including the front and back end can be described as follows:

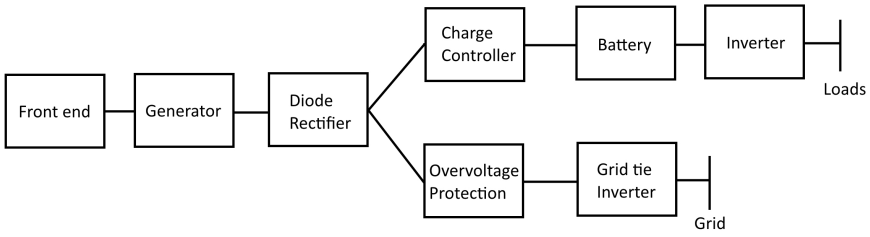

Figure 1: Schematic overview of an AFPMG system.

- **Front end and energy storage**
  The generator shaft has to be rotated with a certain force in order to produce power. This can be done using a variety of devices (e.g. wind turbine, water wheel or another generic device). This documentation describes the use of a wind turbine and an generic device as front end.

- **Generator**
  The generator generates power by moving magnets through a series of coils. The amount of coils, turns per coil and magnet size determine the performance of the generator.

- **Rectifier**
  The rectifier converts the Alternating Current (AC) to Direct Current (DC). This process is known as rectification.

- **Energy storage**
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