The paper presents a new Vertical Axis Wind Turbine (VAWT) design by using magnetic levitation (Maglev) and Permanent Magnet Synchronous Generator (PMSG). A lab prototype of VAWT was built which was run at low wind speed of around 3 to 5 meter per second. The bearing was replaced by Neodymium Magnet to avoid the friction which in turns reduces the losses and increase the efficiency. A Prototype version of PMSG was built which could generate voltage from the turbine even in low rotational speed. Suitable turbine blade angle was also determined using trial and error method.