

# Design and Fabrication of Savonius Power Generation

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## Abstract

According to latest requirement taken into vision here decided to generate a system i.e. Design and Fabrication of Savonius Power Generation. This turbine is basically Hybrid Turbine. This turbine can be operate on non conventional energy source. This system works on Wind Power and water force. There is requirement of minimum non conventional energy source. So this turbine can be place at any location and at any geographical structure. This is the advanced turbine. This system is cost effective and easy to implement at any location. The Maintenance of this system is less so system is optimistic and cost effective. This System can be operate on minimum availability of non conventional Energy source. This system can be able to work in any atmospheric conditions. It can be use at hill station so that with the use of non conventional energy source i.e. Wind flow with maximum proportion. This system can be install at river places to generate electricity. This system can be able place at Sea site. This system can be place top of buildings and complexes. This system can be place at hybrid Dam. This system can be useful at river dam also.

**Keywords:** Volts (V), Current (I), Watt (W),

## Block Diagram of Savonius Unit:

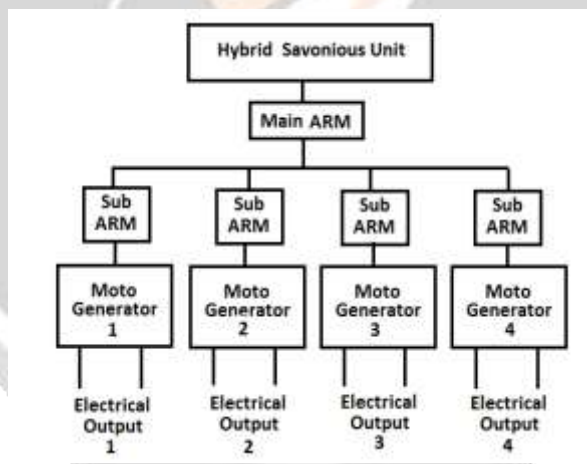


Fig 1:Block Diagram for Savonius Unit

This system consists of following units

1. Turbine unit
2. Shaft and Casing Arrangement
3. Gear Box Arrangement
4. Generator Arrangement
5. Electrical Output Arrangement

The fabricated arrangement of savonius turbine unit is basically hybrid turbine which operates over Non Conventional energy sources. The non conventional energy sources are Natural Wind and River/Sea water force etc.

To operate over nonconventional energy source there is requirement to use a particular turbine. As this system is a hybrid system so here effectively fabricated savonius turbine.

#### **Savonius Turbine Arrangement :**

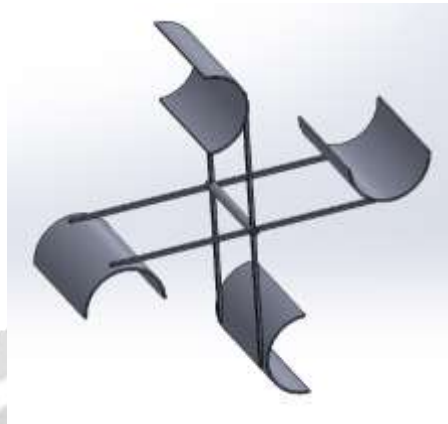


Fig 2: Turbine Arrangement

This turbine is curved shape turbine made by mild steel material. The curved plates placed over a particular chesis. To place a complete turbine on a shaft here used a particular casing arrangement. This casing is coupled with turbine so that it can be easily locked with shaft.

#### **Gear Box Arrangement:**

This savonius system uses a particular spur gear arrangement to create a strong gear box. This gear box is having following arrangement

1. Main ARM arrangement
2. Sub Arm Arrangement.

#### **Main ARM arrangement**

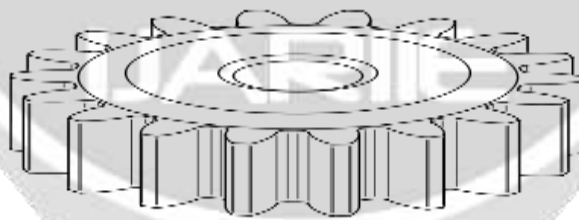


Fig 3 : Main ARM (Gear)

#### **Specifications of Main ARM :**

1. Material Used : Mild Steel
2. Diameter : 4 inch
3. Thickness : 0.5 Inch
4. Number of Teethes = 60
5. Center hole :20mm

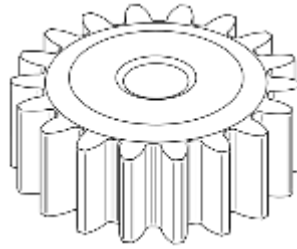
**Sub ARM Arrangement.**

Fig 4 : Sub ARM (Gear)

**Specifications of Main ARM :**

1. Material Used : Mild Steel
2. Diameter : 27mm
3. Thickness : 0.5 Inch
4. Face width : 6mm
5. Overall width : 15mm
6. Center Hole Diameter : 6mm
7. Number of Teethes = 60

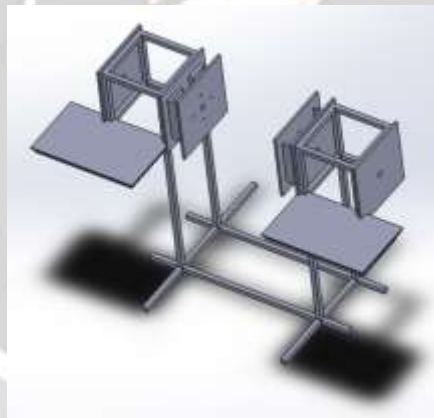
**Chassis Design :**

Fig 5 : Chassis Arrangement

**Chassis Specifications:**

1. Height : 4 feet
2. Length : 5 feet
3. Material Used : Mild Steel
4. Gear Box : 12 inch by 12 inch

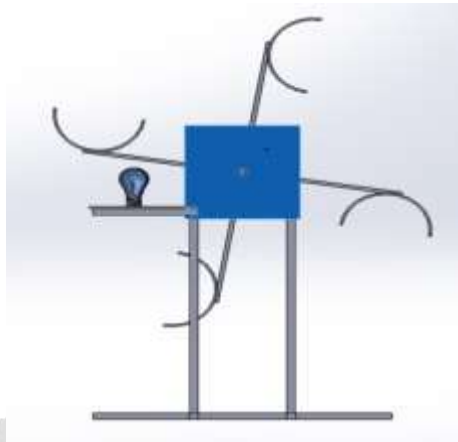
**Fabricated Assembly :**

Fig 6 : Side View of Fabricated Assembly

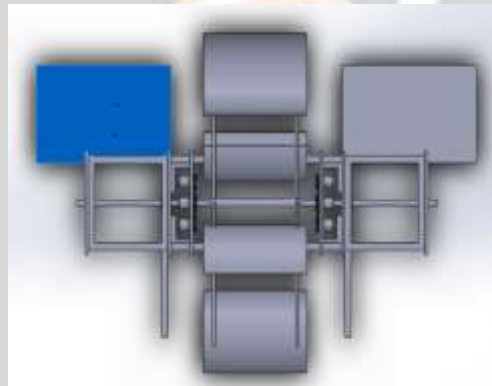


Fig 7 : Top View of Fabricated Assembly

**Turbine Plates:**

The savonius turbine plates are made up of mild steel. The basic plate size is 2 feet by 1 feet. This mild steel plate passed through rolling machine. The final construction is curved plate. The dimensions of curved plates are 12 inch by 12 inch. This curved plate placed over a particular arrangement.

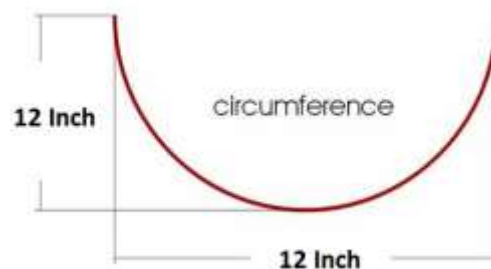




Fig 8 : Plate Arrangement



Fig 9 : Multiple Plates

### Generator Arrangement:

### Design of Generator Unit :

Generator is basically permanent magnet multi pole generator. This generator is basically 20 watt generator. This generator can able to carry up to 2A current. This generator uses armature winding and permanent magnet as a field with 3 electromagnets.

1. Maximum RPM capacity : 300
2. Maximum Torque Range: 10 - 15 Kg-cm
3. Geared Status : Heavy duty metal gears
4. Height of Generator : 6 centimeters
5. Length of Generator : 3.5 centimeters
6. Weight of machine : 99.8 grams
7. Operating Voltage range : 6V to 18V

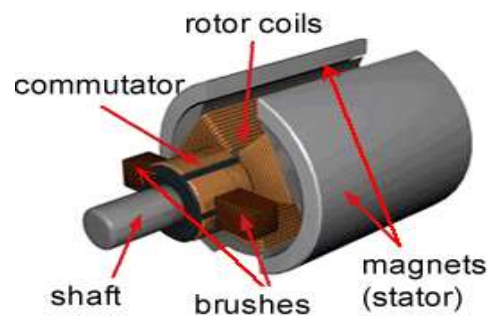


Fig 9 : Generator Arrangement

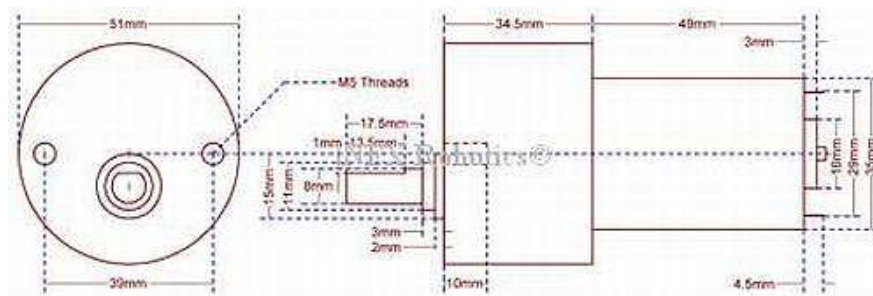


Fig 10 : Generator Design



Fig 11 : Real View of Armature View



Fig 12 : Real View of Generator Casing

### Applications:

1. It can be use at hill station so that with the use of non conventional energy source i.e. Wind flow with maximum proportion.
2. This system can be install at river places to generate electricity.
3. This system can be able place at Sea site.
4. This system can be place top of buildings and complexes.
5. This system can be place at hybrid Dam.
6. This system can be useful at river dam also.

### Advantages:



1. This system is cost effective and easy to implement at any location.
2. The Maintenance of this system is less so system is optimistic and cost effective
3. This System can be operate on minimum availability of non conventional Energy source.
4. This system can be able to work in any atmospheric conditions.

**Conclusion:**

This savonius turbine is hybrid type of turbine can able to work on any kind of nonconventional energy source like air and water. This complete system is having minimum loss as this is curved shape turbine. This system works on minimum RPM and maximum rotation that means on Minimum RPM of turbine the generator will rotate maximum level and accordingly we will get definite output.

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