Team Medextrous

Venturi- Windmill

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Abstract

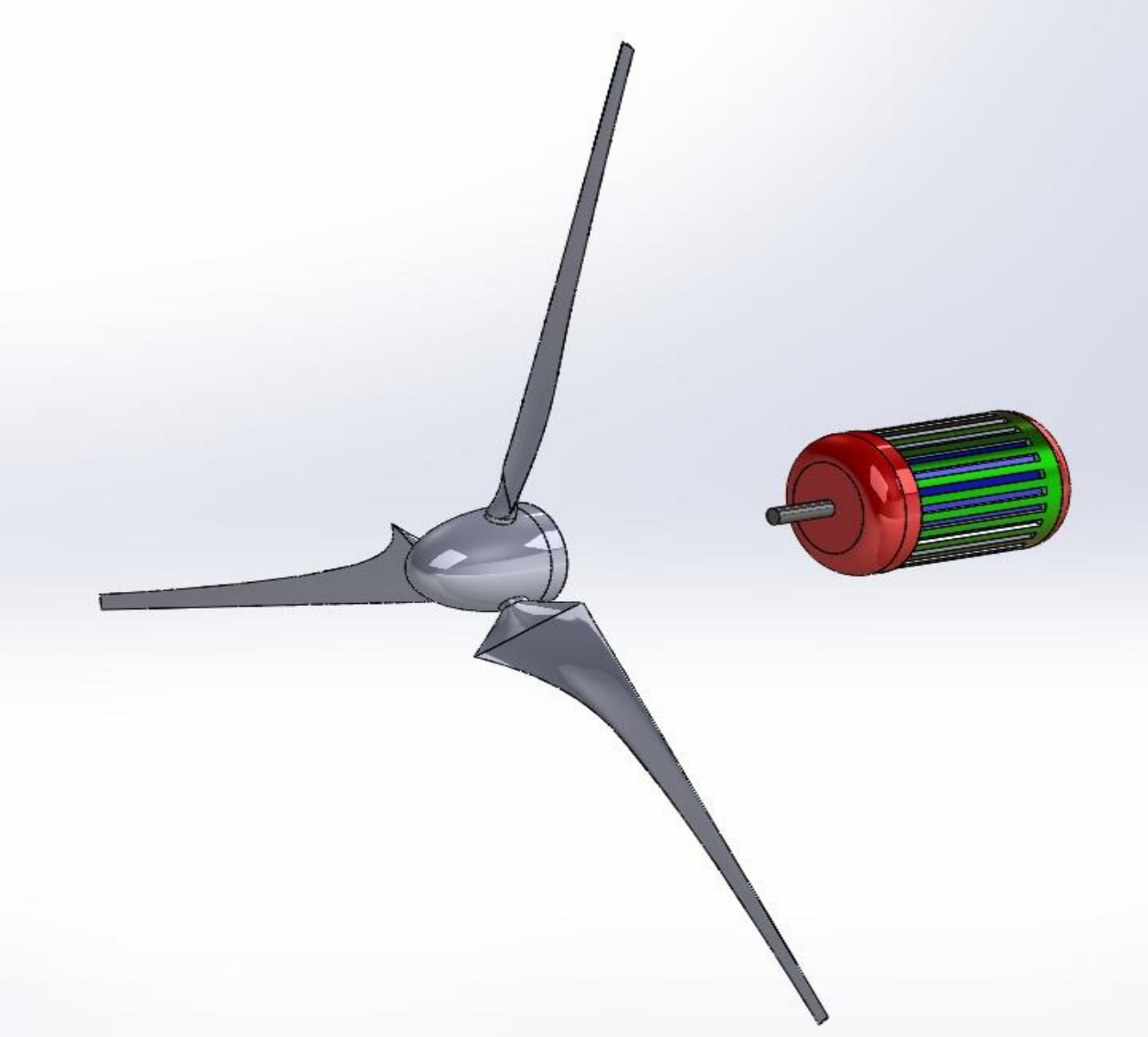
Electricity requirement are increasing with the improvements in various technologies. Therefore electricity generation is becoming a great issue. Wind energy is the most economical way of producing electricity but there are certain problems which needs to be solve to make it more efficient.

Problem Statement

- Main motive of the project "Venturi wind mill" is to capture the air from all directions and take the air flow to the blade assembly.
- Also there are lots of places where current traditional wind turbines can not be setup due to low wind speeds and the large sizes. So direction of air flow, wind speed and setup area being a major problem in many cases , we have designed a model on the basis of venturi effect which resolves all these issues.
- If implemented on a large scale it can produce 400% more power than other traditional wind turbines. We have implemented it on a small scale but can be used for mass production and it can also setup in a small area.
- Dimensions of our model are (10 x 12 x 10)m. So our design can be used on farmhouses, small scale industries and also for the household purposes.

Design

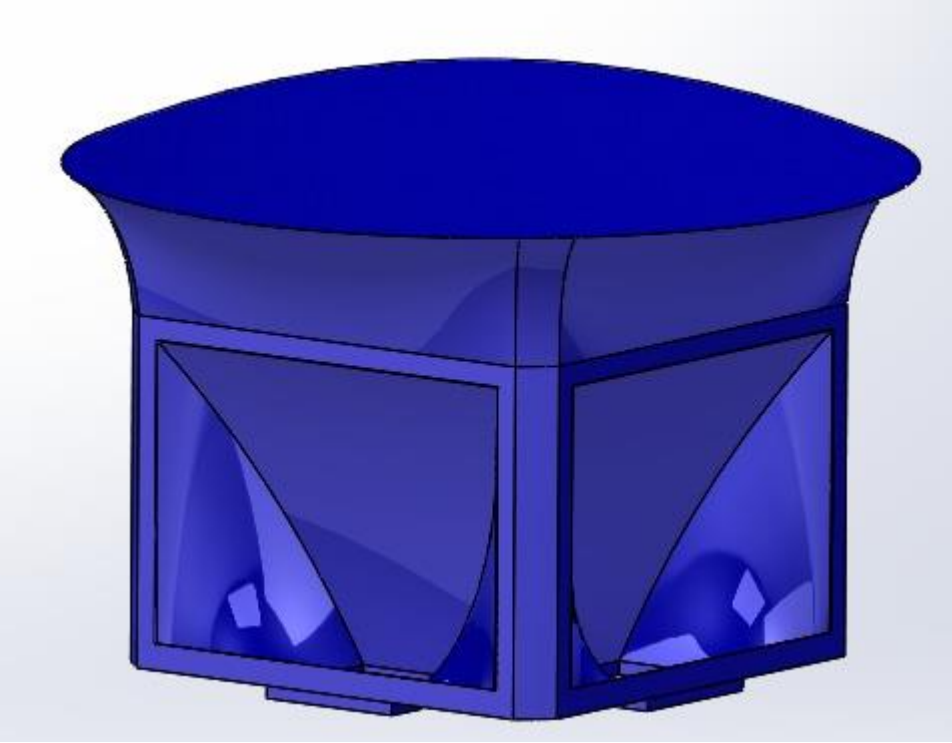
Design



Execution and Working

Upper Funnel

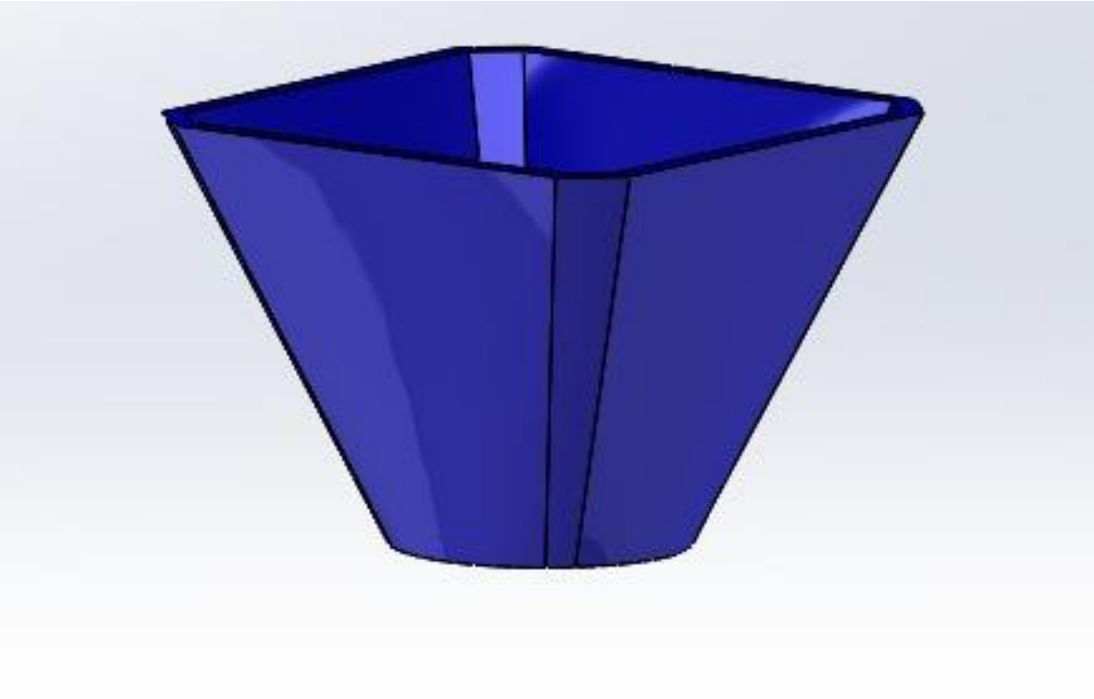
Upper funnel is used to collect the air from all the directions and delivers it into lower funnel.



Execution and Working

lower funnel

Concentrates the air flow and transfers it to elbow.



Execution and Working

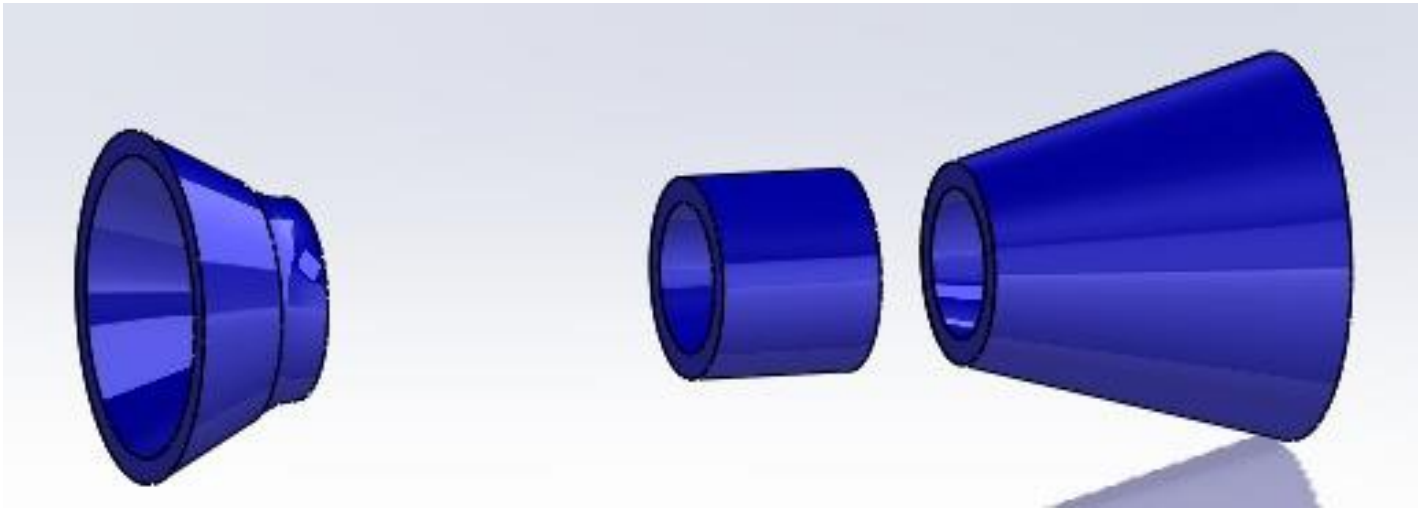
90 degree elbow

Elbow is used to turn the air flow through 90 degrees so that it can reach to a venturi tube which is placed horizontally.

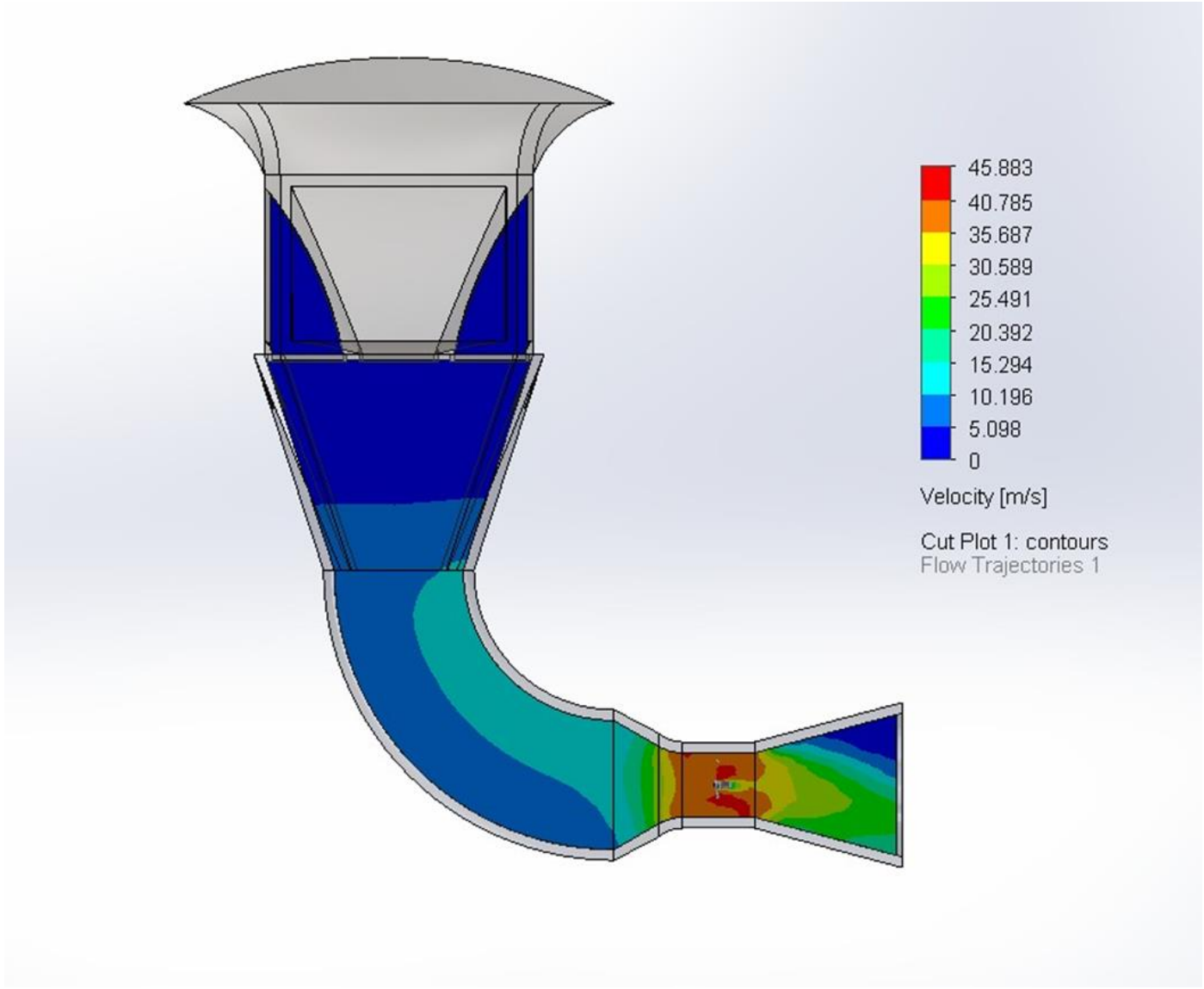
Execution and Working

Venturi Tube

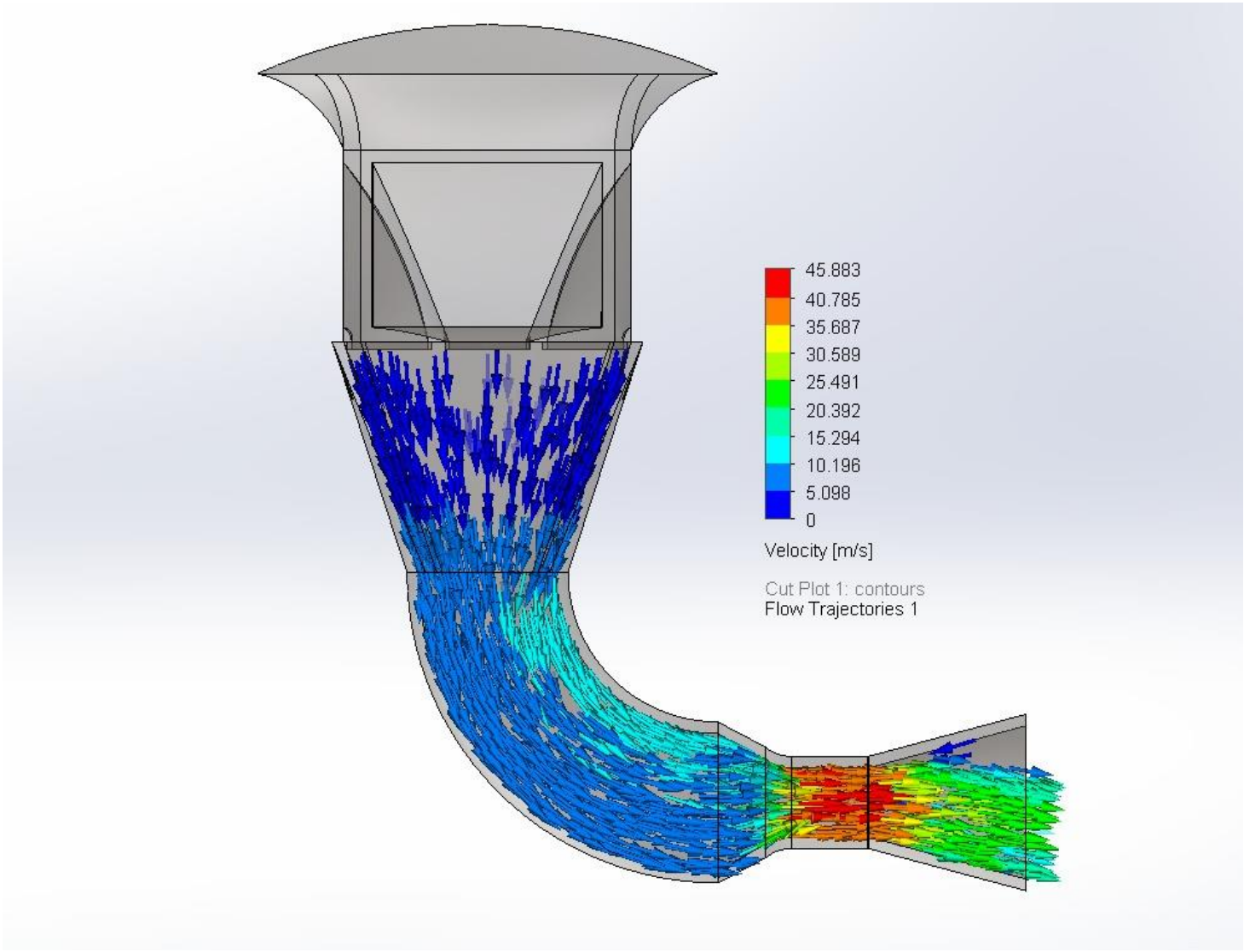
Venturi tube consists of three parts : Convergent section, venturi throat and divergent section.
Venturi tube will increase the velocity of air. As the wind speed will be maximum at venturi throat therefore we will place a blade assembly and a generator inside venturi throat to convert the mechanical power into electrical power.



Simulations



Simulations



Benefits

As we are using the most economical energy source to generate electricity hence it is environment friendly.

It also helps in making the air flow uni-directional by capturing the air from all directions due to which the efficiency of wind turbine increases.

As the size is reduced by 10 times therefore it will acquire less space on ground.

It can be used in desert and villages which are facing electricity scarcity.

Conclusion

We have achieved a omni-directional intake.

We have achieved electricity generation at a wind speed of 2m/s which is easily available in many places.

Produced electricity in more economical and efficient way.

With the help of venturi windmill we have reduced the manufacturing cost and maintanance cost.

Thank you