# THE DEVELOPMENT OF A MICROGENERATION SYSTEM TO OBTAIN ENERGY FROM TIDAL CURRENTS

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**1. Introduction –** In this investigation we will address the design and fabrication of a system capable of harnessing tidal currents for the microgeneration of energy. In order to do so, a helix turbine with a vertical axis will be employed. Amongst the advantages this turbine is that it is unidirectional, it can be placed either horizontally or vertically, it can be started automatically, without external force unlike other similar models, and it works at a 35% efficiency.
The objective of the investigation is to design and simulate the turbine, using SolidWorks software, seeking to maximize the torque, construct a prototype which will be used to obtain the experimental data, to then afterwards move forwards to the construction of the final equipment in order to generate electricity.
**2. Experimental –** For the purposes of testing, an aluminium structure has been designed which can be seen in Image 1, onto which the vertical wooden turbine is fixed. On the upper part of the structure a torque sensor is placed and above that a motor, both fixed onto the axis of the turbine. The function of the motor is to vary the revolutions per minute of the turbine when the current is upon it and in this way to test its performance, with the help of the obtained torque in each of the tests. In Image 2 we can observe a photo of the experiment with the prototype in the water channel.

Image 1 Image 2

**3. Results and Discussion** – In Image 3 the results obtained from the experiment are visible. We can see that with a water flow of 1 m/s and revolutions varying from 40 to 140rpm, a maximum efficiency of 21.18% rpm is obtained.

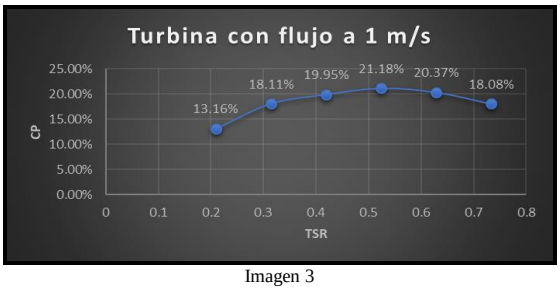


Imagen 3

**4. Conclusions –** Comparing this with other turbines of similar dimensions and build, the results obtained are superior, as the other turbines present results of less than 20% efficiency and in this investigation, we obtained a maximum efficiency of 21.18% as the Image 3 demonstrates. This is valuable for better exploitation of the energy of tidal currents.