



**CALIFORNIA STATE SCIENCE FAIR  
2012 PROJECT SUMMARY**

<b>Name(s)</b> <b>John Ghantous</b>	<b>Project Number</b> <b>J0110</b>
<b>Project Title</b> <b>Wind Power</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The initial idea and purpose of this project was to learn what affects windmills, and possibly make a discovery that could change the ways windmills produce power. <b>Methods/Materials</b> This experiment was done by first, constructing a windmill and six blades all of the same shape, then placing a fan (a steady and constant wind source) a foot away from the windmill and measuring the power produced in millivolts. After that, six blades were placed on the windmill and the angles were changed to 5 degrees, 15 degrees, 25 degrees, 45 degrees, and 90 degrees (control) and power measurements were taken to see how the change in angles affected the output. The same was done for three blades. To make the experiment accurate, this procedure was done to both three blades and six blades three times. <b>Results</b> The contributions and benefits of this experiment were twofold. First, six blades produce more power than three blades; and second, less deviated angles produce more power than more deviated angles. This is because when the angle of the blade is less deviated, there is more space for the air to hit it. <b>Conclusions/Discussion</b> In conclusion, this project determined that six blades produce more power than three blades. This proves that in most circumstances, wind turbines with the most blades produce the most power. Also, this project proved that less deviated angles produce more power than more deviated angles. In addition to that, this project determines that with the right circumstances changing the angle and the amount of the blades can affect the amount of power produced by the wind turbine.	
<b>Summary Statement</b> The effect of the angle and the amount of blades on a wind turbine's power.	
<b>Help Received</b> Father taught me how to use CNC drill.	