



# CALIFORNIA STATE SCIENCE FAIR 2002 PROJECT SUMMARY

<b>Name(s)</b> Cody R. Lewis	<b>Project Number</b>  22421
<b>Project Title</b> <b>Wind Power: A Study to Determine the Feasibility of Utilizing Wind Power to Meet the Energy Demands of the M.J.U.S.D.</b>	
<b>Objectives/Goals</b> The formation of this project stemmed from the simple observation of a few facts. The wind, for one, has been around since the beginning of time. Enthusiastic environmental concerns have been around for about five decades. Rolling blackouts started to occur when CA State's energy supply suddenly dropped in the late spring of 2001. Moreover, recently the Muroc Joint Unified School District has plunged very low, almost to the level of a state take over due to lack of funds. Combining these few basic facts I formulated a project that would be environmentally friendly, a power grid stabilizer, and economically smart for my school district because of the free price of the power source...WIND! <b>Abstract</b> <b>Methods/Materials</b> To begin my project, I collected 18 months of Edison billing data from my district and 12 months of hourly wind data from the Edwards AFB Flight Line wind sensors. I needed to enlist the help of both an ENRON Director of Electrical Engineering for expertise on what size wind turbine would be best and a sales engineer to prepare a non-binding bid proposal. I also needed to utilize several conversion formulas in order to interpret my data correctly. Wind and the factors that affect wind had to be researched as well as the topography of the area. Visits to the Tehachapi Wind Farms, the Tehachapi ENRON Manufacturing Facilities, as well as the Edwards AFB Weather Observing Office were vital to my understanding the key equipment and data needed for my project. <b>Results</b> I found that a 1.5 MW wind turbine would be the turbine of choice. The 1.5 MW wind turbine was found to generate enough kWh to supply the energy needs for the original 5 Edwards schools. It became obvious that there would also be enough energy to meet the entire district's energy needs as well. After calculating the difference between the district's energy consumption and the wind turbine's energy production, there was still enough energy left over to generate a 47% cushion for expansion, growth and possible sale. <b>Conclusions/Discussion</b> All things considered, wind energy appears to be an awesome alternative for the MJUSD. This project supports that wind is cost competitive and stable for our area, quick to permit and build, consumer and environmentally friendly, and a very reliable intermittent power supply. In an area where wind is abundant, it is feasible that a 1.5 MW wind turbine can meet the energy demands of the entire M.J.U.S.D..	
<b>Summary Statement</b> The energy needs of the entire Muroc Joint Unified School District can be met by utilizing a 1.5 MW (mega-watt) wind turbine.	
<b>Help Received</b> Peder Hansen: ENRON Sales Engineer prepared a non-binding bid for the 1.5 MW Wind Turbine.	