



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

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Project Title Energizer	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The reason we did this project was to see which type of alternative fuel source provides the most amount of energy. We compared the plant based material to coal and gel alcohol to see if it would be a better choice for power plants to burn.</p> <p>Methods/Materials We used the following experimental method in our project and these formulas helped us find the biomass energy content: To find total energy content we multiplied 50 g of water (assuming a density of 1g per 1ml) with the heat gain that equals total energy content. ($50 \text{ g} \times H = \text{TEC}$) Then, we needed to find the fuel consumed which was the mass before minus the mass after and we got the fuel consumed ($MB - MA = FC$). To find the total energy per gram we took the total energy content divided by the fuel consumed and we got total energy per gram ($\text{TEC} / FC = \text{TEC per gram}$). Finally we took the total energy content minus the gel alcohol energy content (from the gel alcohol test alone) and we got the material energy alone. ($\text{TEC} - \text{GAE} = \text{BE}$).</p> <p>Results We found the two highest energy generators were the gel alcohol and the coal; however, it takes energy to create these materials. Out of the plant based materials wood was the highest. Plants are the best choice to burn because they take CO₂ out of the air when they grow.</p> <p>Conclusions/Discussion After much discussion we decide there really wasn't an overall best because each material had its pros and cons. For example, the plants take CO₂ out of the air when they grow, but they don't have a high energy content. The gel alcohol has a high energy content but it requires energy to be made.</p> <p>We burned different material to see which one had the highest energy content.</p>	
Summary Statement Which alternative fuel source has the highest amount of energy	
Help Received My Dad supervised the burning of materials and my Science teacher Ms. White guided us the first steps to get started.	