



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

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Project Title Garbage to Gas	
Objectives/Goals In the US, we cannot control the gas economy since most of the gas comes from the Middle East. Thus, we have to find other sources of fuel such as biodegradable fuel. Our objective was to test if we can obtain an usable amount of "bio" fuel from household organic waste.	
Abstract	
Methods/Materials Materials: household organic waste (vegetable/fruit peels, coffee, tea grounds etc) Distillation apparatus and thermometer Methods: We collected organic housewaste in a large can for one week, sealed with saran wrap and stored in a warm, dark place for upto 2 weeks to compost and ferment. Then we transferred it into a large conical jar fitted with the distillation tube. It was heated on a hot plate to 100oF. When the vapor started coming, water was let into the outer wall of the distillation tube. The resulting liquid was collected in a collecting can. 8. Sample is labeled and sent to a commercial lab for alcohol analyses. 9. Measure volume of collected sample of alcohol and compare with volume of original compost sample.	
Results A total of four experiments were done, three with organic compost and one with grass. The starting amount of organic house waste was 5 pounds (2.4L) for each experiment. We were able to isolate about 27ml of alcohol from 2.4L(5lbs.) of organic compost; however, no alcohol was obtained with grass. Among the alcohols, the majority was ethanol and methanol	
Conclusions/Discussion We thought that biodegradable fuel could be obtained from sources other than corn, which is a good source of protein and fiber. Further, alternative fuels can improve the economy. In our experiments, we clearly prove our hypothesis and show that organic waste is a good source of biodegradable fuel. We realize that if we control temperature and seal the containers air tight, we can get more fuel. We thought it is very good to have a comparator that may not produce much alcohol and so we chose grass. We think our results make perfect sense since we got a lot of ethanol and methanol, both of which can be used as alternative fuel. We were lucky to be able to find a lab to measure the alcohol. If this project is given to companies, they can perfect the methods and do it in large scale. There will be less pollution, better use of the organic waste, more people will get jobs and we have to buy less fuel from the Middle East. This may be a great way to solve global warming.	
Summary Statement This project showed that one can use household organic waste to obtain biodegradable alternative fuel.	
Help Received My Dad helped get the equipment at a cheap store and My Mom found the commercial lab to test the alcohols. Jay's Dad mowed the lawn to get grass	