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Coconut Biofuels: the Smell of the Future

Although biofuels sound like a thing of the future, they have been around as long as the diesel engine itself. Rudolf Diesel used peanut oil in his original engine at the 1900 World's Fair. He expected that his engine would be powered by vegetable oils and seed oils. The development and enforcement of biofuels in conjunction with small diesel engines could greatly reduce air pollution ("Hemp Car" 2000). Mr. Diesel firmly believed the utilization of a biomass fuel could be the real future of his engine. He wanted to provide farmers the opportunity to produce their own fuel. In 1911, he said "The diesel engine can be fed with vegetable oils and would help considerably in the development of agriculture of the countries which use it". He was a very smart man but unfortunately with his death also came the death of a champion for biofuels as a possible resource ("Biodeisel" 2007). Although the major enthusiast of the possibility of biofuels as a world wide resource died, the use of them in small amounts, and in specific times of need, did not. In fact, vegetable oil was used in WW II when diesel fuel was low in quantity (Cloin "Coconut" 2007). With the current need to look for alternative fuels, biofuels have again come to the forefront of discussions on alternative energy. It makes sense to look at renewable sources of fuel, and if we run out of biofuels, the least of our problems is how to power engines.

A Biofuel is a solid, liquid, or gas fuel consisting of, or derived from biomass ("Biofuels" 2007). A biomass is living or recently dead biological material which can be used as fuel or for industrial production ("Biomass" 2007). Some examples of biomass are corn and soybeans, rapeseed, wheat, sugar beet, animal fats, starch, sugar cane, palm oil, and jatropha. Biodegradable outputs from industry, agriculture, forestry and households can be also used to create biofuels ("Biofuels" 2007).

Why biofuels? Fossil fuels are expensive, bad for the environment, and finite. Assuming that oil, gas and coal are being consumed at a constant rate, researchers suggest that we can consume oil at the current rate for 45 years, gas for about 72 years, and coal for about 252 years before none of these finite resources are left. In the United States, more than 90% of greenhouse gas discharges come from the combustion of non-renewable fossil fuels. Greenhouse gasses are essentially gasses that produce heat waves that warm the eaths atmosphere. Burning of fossil fuels also produces other air pollutants, such as nitrogen oxides, sulphur dioxide, volatile organic compounds and heavy metals.When nitrogen oxides and volatile organic componds ineract in the sunlight it creates smog ("Fossil Fuels 2007).). Obviously both the greenhouse gasses and smog are not good for the enviornment. Is burning fossil fuels to drive a car worth having a harder time breathing and global warming? It was estimated that in 2004, 86% of human-produced energy came from burning fossil fuels. If there is something that we can do to limit or cease the pollution caused by using fossil fuels, is it irresponsible not to do it.

Biofuels on the other hand are a great deal cheaper than regular fuel, and do not harm the environment [plus they make the air smell good!], and can be grown again and again, making them renewable. Biofuels are being considered now because people are starting to understand that instead of waiting until all the fossil fuels run out, it would be better to have a plan now. Think about it. If all of the fuel in the world were to be gone, how would we survive? We live on fuels: Fuels to run cars, fuels to cook food, fuels to run our basic economy. It would be almost impossible for most industrialized countries to go without cars, cooked food, and in some cases electricity, because of how accustomed people have gotten to these luxuries. People in modern times take fuel for granted; imagine going one week without any fuels. Could you do it? Going one week without a ride to school or work: there would be no fuel for cars or busses, would you be willing to ride a bike or walk? One week with no stove or

oven, there would be no fuel to light it. One week with no food unless it was homegrown: there would be no fuel for the trucks and planes to transport the foods to the stores. Just think about it, could *you* do it?

So if we accept that fossil fuels are finite, and that biofuels are a solid solution to the increasing energy problem, then it is each country's individual responsibility to find solutions that fit the lifestyle and resources of the area. In this paper I will specifically be talking about coconut oils being used as biofuels in the Pacific Island region.

The islands lying south of the Tropic of Cancer (excluding Australia) are considered the Pacific Islands. This includes: New Guinea, Papua New Guinea, New Caledonia, Vanuatu, Fiji, the Solomon Islands, Marianas, Guam, Wake Island, Palau, the Marshall Islands, Kiribati, Nauru, Federated States of Micronesia, New Zealand, the Hawaiian Islands, Rotuma, the Midway Islands, Samoa, American Samoa, Tonga, Tuvalu, the Cook Islands, French Polynesia, and Easter Islands.

Even though it is considered all one area, the Pacific Islands have a wide variety of geography, religion, ethnicity and culture. The region's islands are classified into two groups, high islands and low islands. Volcanoes form high islands, which generally can support more people and have a more fertile soil. Low islands which are relatively small and infertile are made of reefs or atolls. An atoll is a coral island forming a ring that nearly or entirely encloses a shallow lagoon. They are surrounded by deep ocean water and range in diameter from about 1 km to over 100 km. They are especially common in the western and central Pacific Ocean and are believed to form along the fringes of underwater volcanoes. The smaller, infertile islands can not grow things very well beacause of the coral basis lacking topsoil, that is necessary to grow the plants. Many islands do have the topsoil and resources needed to grow coconuts. The oil that can be extracated from the coconut makes an excellent biofuel. Coconut oil would possibly need to be transported to the smaller infertile islands, but the price would not be nearly as high as the cost of transporting regular fossil fuels ("Pacific Islands" 2007).

The governments of the Pacific Islands are investigating biofuels because the cost of importing fuels is a huge problem. Papua New Guinea, Fiji, the Solomon Islands, Samoa, Vanuatu, the Federated States of Micronesia, Tonga, Kiribati, the Marshall Islands, the Cook Islands and Palau spend more than US$800 million a year on fuel imports. If the Pacific Islands replaced 50% of diesel imports with coconut oil, the region's average fuel import bill would be cut by 10%. This brings the bill down 80 million dollars to about 720 million dollars a year, just on fuel imports (McCall 1998).

Aside from saving money on fuel imports, coconut oil is being considered by the Pacific Islands because coconut oil takes less processing to obtain than many biofuels. Coconut oil does not need to be transistorized to run in a diesel engine. Transistorizing means mixing the chosen fuel with sodium hydroxide and alcohol to change its chemical composition. This can be an expensive process. No transistorizing means the price of fuels is lowered.

Very simple alterations of coconut oil exist right now. Tony Deamer of Vanuatu has adapted his fleet of rental cars to run on coconut oil. Deamer uses 85% coconut oil and 15% kerosene (Cloin "Pacific" 2006). Living on the islands, Deamer found it would be an easy alternative to expensive fuel. Coconut oil was chosen to be used specifically in the Pacific Islands because coconuts are very common there, so no supplies would need to be shipped. Coconut plantations exist so there is already a place to safely grow all the coconuts needed. Not only is there already a plantation with workers, but if coconut oil is chosen to be used it will create more jobs. Besides the fact that more jobs be offered at the plantation, new jobs would also be created as mechanics and farmers. With those new jobs, the quality of living will rise, and then possible more people will be drawn to the islands, helping the overall economy. Any positive influence on the economy is greatly needed. Prices of fuels are skyrocketing. Biofuel from

Solomon Tropical Products (STP) currently retails for SB$5.50 [US 78cents] while diesel is more expensive at SB$7.50 [US$1.07] per liter. The use of coconut oil biofuels are not only cheaper but also, the use of coconut oil is cleaner than diesel. You can even smell the difference and coconut oil does not leave black clouds of smoke, but a nice coconut smell. Also, with an increased demand, farmers will get more for their coconuts; which is greatly needed on the islands (Cloin "Pacific" 2006).

Slowly converting to biofuels [in this case coconut biofuel] seems a fairly simple answer. So why not use biofuels? In short term tests, biofuels were wonderful, running a car just like regular diesel fuels. Blends of 20% biodiesel with 80% petroleum diesel can be used in unmodified diesel engines. Biodiesel can be used in its pure form, but may require certain engine modifications to avoid maintenance and performance problems. ("Biodeisel" 2007). In long term tests, if the fuel contained more than 20% vegetable oil, there was residue left on pistons, valves, combustion chambers, and injectors. Although a little bit of build-up is good for the engine, too much can be harmful for it. The use of biodiesel can extend the life of diesel engines because it is more lubricating and therefore, power output is relatively unaffected by biodiesel. Although there will be a maintenance fee, it will be worth the investment. The price of changing your filter more often is better than the continuous high price of fuel. If the production of coconut oil biofuels continues, coconut plantations will need to be restructured and the mechanics and engine manufacturers would need to be trained in biofuel engines and maintenance (Cloin "Coconut" 2007). The mechanics would likely find this reasonable, because mechanics are constantly needing to update their skills and learn new things to keep up with the new models of cars. Coconut biofuels make a lot of sense for the Pacific Islands.

If the islands were to use coconut biofuel as the Pacific Islands region-wide fuel, life on the islands would change drastically. Over a year or two, millions of dollars would be saved and hopefully put to better uses than a non- renewable resource. Tons of new jobs would be made ranging from plantation workers to mechanics. Farmers would be getting more money for crops, helping them live a better life. Increased and better jobs will allow opportunity for Pacific Islanders to make a living, and maybe fewer would feel compelled to leave their home to find opportunity for success. Imagine the eco-tourism that the Pacific Islands could enjoy as a result of the entire region being proactive about finding renewable energy sources. More people would want to visit the new eco-friendly islands, also helping the economy. There would be no worry of the islands running out of fuel anytime soon and they would be a step ahead of the rest of the world because they are smaller and can more easily convert cars and fuel for the entire region. Last but not least, the air around the islands would smell great because of the coconut oils being used.

Personally, I think that if the Pacific Island region figured out which industries or areas use the most fuel on their respective island (cars, plantations, manufacturing, etc.) and started converting the areas with the most important impact first, it would be very effective. For example: if plantations used the most fuel on the islands as a group, the island governments would go from plantation to plantation and alter the equipment to use biofuels and implement a transfer to running on exclusively coconut oil fuel. If all goes well and as planned then once all of the plantations were taken care of, the government would go to the second priority things, such as cars and convert as many of them as possible. The first changes would be in public transportation. Island governments could also offer discounted prices and subsidies on personal vehicle changeover. Once all the cars are done, pick up on the next priority, and so on. It is not necessary to do everything at once, but a swift and purposeful transition could be powerful. This way the Pacific Islands region could wean itself off of fossil fuels in a way that is not overwhelming. (Nichols 2006).

A region of the world as unique and important as the Pacific Islands should take the chance and seriously consider the option of coconut biofuel. It could have powerful effects on the Island economy through creating jobs, increasing the demand of a local product, decreasing the cost of fuel, and

increasing tourism. Biofuels must be brought back to the conversations about alternative energy, because by their very nature they are renewable.

What can the average person do about the issue of converting to biofuels in the Pacific region? You can talk about it. You can support politicians that encourage alternative energy research and implementation. Most importantly, you can be aware that the rising cost of fuel affects most people around the world and be open to trying new technology.

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