

Issues & Questions relating to Coco-Biodiesel

(April 20, 2007)

1) Is it more expensive to use coco-biodiesel?

No. Consumers are easily misled by the price difference between diesel and coco-biodiesel. It is true that to blend 1% may increase the diesel price, and as explained below, this price increase is not inevitable. However, the mileage gain alone can range from 10-20%, and even be as high as 25% depending on the condition of the vehicle. The mileage-gain more than makes up for the increase (if any) in the price of diesel. Usually, old vehicles and operators of public utility vehicles benefit the most.

2) Is coco-biodiesel toxic?

No, CME is not toxic. Toxicity tests conducted by DOST-ITDI on rats showed no negative effect on oral and dermal toxicity. Diesel appears even more toxic than CME. In fact, CME may be ingested without causing death or serious disability.

3) Is coco-biodiesel proven to be safe?

Flying V has sold over 35 million liters of pre-blended B1 Biodiesel in all Flying V Stations nationwide since last year. Assuming that each motorist that used B1 diesel runs only at 5 kms/liter, then the 35 million liters translates to an aggregate total of 175 million kilometers. There had been no major legitimate adverse effect on the use of 1% CME in diesel fuel.

The most knowledgeable organization when it comes to engines is the Chamber of Automotive Manufacturers in the Philippines, Inc. (CAMPI), not the technical people of the oil companies. CAMPI has given its formal endorsement to the Dept. of Energy certifying that they have no objection on a 1% blend of cocobiodiesel. This means they find no basis that 1% cocobiodiesel can have damaging effect on engines even on a long term. Furthermore, the diesel fuel being sold by the oil companies in the Philippines are barely meeting Tier 2 standard. Cocobiodiesel by itself conforms to Tier 3 Standard. Tier 1 to Tier 5 are international measurement of fuel quality standard where the higher number represents better fuel quality. Surely, blending 1% of a Tier 3 fuel into 99% of a Tier 2 fuel cannot, by simple logic, develop adverse effect in the long term. This was a concern in the early stages of CME development but the CAMPI endorsement has put this issue to rest.

4) What price premium does a vehicle owner pay when using coco-biodiesel?

The pricing of B1 is entirely up to the oil companies and their station operators. Some may absorb the price entirely as Flying V has done. Flying V was able to do this despite being an independent oil company that purchases diesel from Total and PTT. What more with the likes of Shell, Chevron and Petron who operate very profitable refineries? With regards to pricing of B1 at retail, we suggest that the oil companies factor in a fixed price for CME for retail pricing, same way as additives are costed into the fuel.

The expected price range for CME is P35-60/liter (ex-plant, zero-VAT basis). Today's refined coconut oil price (at P45/kg) is as high as it has ever been, after last year's typhoons caused prices to jump P10/kg. If coconut oil increases by another P8/kg, CME will likely reach P60/li at worse. On the other hand, we expect diesel to trade between P25-40/li. The worst 'price spike' will happen only when diesel drops to P25.00/li and CME jumps to P60.00/li, at the same time. Even then, the price impact of CME in a B1 blend will only be P0.35/li. It will not be as much as the P0.50/li price adjustments in petroleum diesel we grew accustomed to during the past years. Come to think of it, if oil companies factor in P0.35-0.50/liter for B1, they will actually enjoy another modest margin on the blended fuel.

We suggest factoring the cost of CME one time assuming a worst scenario of P0.35/li. As CME prices move within a range below P60/li, there will be extra margin to spread for other use. Another possibility, so that consumers may not perceive a change in price, is to combine the introduction of B1 with an adjustment coinciding with a drop in oil prices. Gas stations may maintain the price temporarily to let the cost of biodiesel be built in without the public even feeling the sting.

Another way to cushion the impact of a price increase due to B1 is by taking out lubricity additives in all low-sulfur diesel. These imported additives become redundant once CME is used. CME imparts lubricity, higher cetane, detergency and oxygen for better fuel combustion. It is also possible that additive replacement by CME can cause diesel prices to actually come down.

5) What kind of savings can be expected?

The savings vary with vehicle conditions and driving patterns; however, a good average figure would be 10% fuel savings. The savings come from improved mileage, longer service intervals, better fuel efficiency and prolonged engine life. Compliance with the Land Transport Office's smoke and emission testing is another cost saving.

6) What is the forecast demand for coco-biodiesel in the Philippines?

The annual consumption of diesel-fuel is 7 billion liters per annum. If the target blend ratio is 1% then the Biodiesel requirement is 70 million liters per annum.

7) Is there enough capacity to supply this requirement?

The production capacity as of March 2007 can serve more than the forecast requirement. Chemrez alone can supply 75,000 MT of CME, which is more than the national B1 requirement.

8) Can the coconut industry support the volume?

Coconut oil production in the Philippines has seen a steady decline in the last decade. Even so, 80% of the production is exported. A strong demand for coconut oil in biodiesel application will give oil producers a much stronger customer-base. Strong and consistent demand will also stabilize coconut oil prices and encourage the farmers to produce and harvest more. This will have far reaching benefits for the coconut industry. Coco-biodiesel program in the Philippines will single-handedly rejuvenate the coconut industry for the country.

PDSI (Pandacan) where Petron, Shell and Chevron distribute 60% of the country's diesel supply is a strategic blending site. The volume of diesel (both automotive and industrial diesel) turnover at PDSI is 6.43 million liters per day- requiring a mere 64,300 liters of coco-biodiesel to blend B1 (or roughly 107,100 liters nationwide requirement per day). It may interest you to know that Chemrez's daily production capacity is 200,000+ liters! Now, the national demand for CNO to serve the B1 mandate is actually not very much at 4500 tons per month (roughly 5 million liters of CME). Chemrez alone can already supply the entire B1 requirement of the Philippines. A recent statement by the PCA notwithstanding, there is still enough CNO production in the country to supply B1 -- and indeed, more than a B1 blend.

Will CME affect the local supply of coconut oil? No. In fact, around 70% of CNO production is already being exported. On food demand here in the Philippines, any coconut oil exporter and trader will tell you that palm-olein has replaced a big portion (more than 40% to date) of coconut oil in our local food industry. One only needs to look at the labels of cooking oil in the supermarket shelves and find that this product is labeled only as vegetable oil, not specifically coconut oil. Coconut oil consumption is dwindling.

Will CME affect our foreign exports of coconut oil? Not really. Demand for it overseas is dropping since palm-kernel oil is almost identical and cheaper. In addition, it should be noted that copra purchased by millers/exporters are paid for within 7-14 days. Each exporter needs to consolidate 5000-8000 tons of CNO to make one export parcel on the big ships. They take positions and assume the risks while tying up working capital. Risks in the volatile market may see a price drop of

\$1/ton- this means an immediate loss of \$5-8 million for our exporter. Lately the strength of the Peso has been taking its toll on these exporters.

In summary: there are currently two threats to CNO. On one hand, there is the dwindling export of coconut oil products. On the other hand, CNO for local food applications is steadily being displaced by cheaper palm olein. So, is there a future for the local coconut industry? Yes, but only because of the coco-biodiesel mandate. There is an obvious future for the cheaper palm oil with biodiesel demand but the Philippines will have to be importing that.

It is indeed possible that an immediate and sizeable demand (for biodiesel) may strain supply in some areas. This may drive prices up. Attractive prices will attract farmers and investors back into the industry. Market forces will inject life back into the industry and into our rural economies. A market driven demand will naturally encourage production. Farm subsidies, levies and handouts did not work for the coconut industry. Assistance rarely ends up in the hands of the farmers anyway.

The volume required for CME can easily and happily be served by 2-3 exporters. CIIF and San Miguel for example would like to serve this requirement rather than export crude CNO. They can turn their money faster by selling 900-1500 ton parcels locally. No exchange risk. Much less money tied up in inventory. Less risks in price fluctuations. They also get to sell refined oil (value-added) instead of crude.

In summary, the CME mandate will be very welcome for the coconut oil industry. The new demand will be happily served by several exporters of CNO. There is no threat at all to the food supply. It is welcomed by the exporters.

9) What is the most effective way of distributing coco-biodiesel and promoting its use? Can a B1 blend be handled without disrupting the operations of oil companies?

The full benefit of coco-biodiesel can only be realized if all diesel-fuel sold in the Philippines incorporates it. Logically, all the oil companies should have a B₁ specification or 1% blend in all the diesel-fuel they sell. Biodiesel can be blended into diesel storage tanks at the oil companies' refinery and fuel depots. That way, there is no additional cost in logistics and distribution. Furthermore, a Biodiesel program can be implemented nationwide almost immediately.

There is no real need for new or specialized equipment. A B1 blend can be easily implemented by "in-line" blending (or dosing) equipment. This should not be a concern because it is available locally with several brands being marketed. In fact, the oil companies, to regularly dose additives into their diesel brands, regularly use such equipment.

The timeline of the 1% biodiesel mandate is very doable specially if given the "phase-in/phase-out " period extension. What is needed to make a B1 blend possible is the willingness and support of the oil company management to make it work.

Some have raised the question of water miscibility of B1 in pipes. The pipeline issue of the oil companies is actually on product discharging from tankers. This concern occurs when diesel fuel (with 1% blend of biodiesel) is pumped from a tanker vessel to a storage tank of depots that have a long discharge line. When the tanker is finally emptied, some amount of product will be left in the pipeline. This remaining quantity is then water-pushed into a settling tank (for water separation). Laboratory test shows that the water moisture on pure diesel after water pushing falls down to around 0.2% moisture in 5 minutes and finally attains the limit of 0.05% in 1 hr and 10 minutes. In contrast, a B1 diesel falls to 0.54% moisture in 5 minutes and finally attains the limit of 0.05% in 2 hrs & 15 minutes. The longer settling time of water moisture in B1 diesel is a valid concern but involves only a very small portion of the total quantity of fuel delivered. If 2 hours & 15 minute settling time is a serious concern, then a simple solution would be to add a demulsifier additive to hasten water separation.

10) Why the urgency of a B1 blend?

Chemrez Technologies, Inc., as well as independent organizations such as The Philippine Biodiesel Association (TPBA) and the Asian Institute of Petroleum Studies, Inc. (AIPSI) are united in believing that the problems addressed by instituting a B1 blend (the state of the coconut industry, air pollution, greenhouse gas and CO₂ emissions that are so instrumental to global warming, oil price hikes, dependence on foreign fuels, etc.) need resolution so urgently as to override the concerns of the oil majors over the timing of the Act. As for logistical concerns, Chemrez Technologies is ready with solutions.

11) Can Coco-biodiesel be made by small enterprises or farmer cooperatives?

No. It is important to distinguish between coconut methyl ester and coco-biodiesel. Anyone with basic knowledge of methyl ester production can make coconut methyl ester. However, very few companies let alone small-scale producers can meet the B₁₀₀ specifications implemented by the Department of Energy (DOE). Not all CME made will meet the specifications for B₁₀₀ Biodiesel. Furthermore, manufacture of methyl ester generates by-products that need proper wastewater treatment and further processing. Separate plant facilities are needed to process these by-products

12) How important is it for Methyl Ester producers to meet the specification set out by the Philippine National Standard (PNS)?

Oil companies will only use methyl ester that conforms to the PNS specifications for B₁₀₀ Coconut Methyl Ester. This is the minimum requirement for a supplier. Using substandard methyl ester entails too many unacceptable risks.

13) Is the Philippines being realistic with regulations in the Clean Air Act?

The air quality standards implemented under the Clean Air Act is very stringent. The biggest contributor to air pollution is smoke and gas emission from motor vehicles- in particular diesel-powered public transport. Coco-biodiesel has been extensively tried in commercial scale and is the single most effective, immediate and cheapest solution to address the problem of air pollution. Without coco-biodiesel, the government will have an unrealistic law that is impractical and costly to implement. Especially now that the DENR-EMB has launched a program entitled “Containing the Diesel Menace”, which focuses on getting public transportation to run on clean or environmentally-friendly engines, there is need for all sectors concerned to realize that coco-biodiesel is currently the fastest way to meet these goals.

14) Which other countries in this region use or promote Biodiesel?

Australia, Malaysia, Singapore, Thailand, and Japan. It is true that the Philippines is the only country in Southeast Asia to have strictly mandated a B1 blend. We should be proud of this as a mark of Philippine distinction and as an urgently needed shot-in-the arm for our economy. Indeed, we need such a mandate more than our neighbors do, given the challenges currently facing the coconut sector.

The Philippines is way ahead of its neighbors on biodiesel technology and already has production capacity enough to supply 2% of the Philippine diesel demand. Given that the worldwide trend is to shift as much as is possible and economically feasible to alternative and renewable sources of energy, there is every reason to tap coco-biodiesel now that it is available.

15) How is coconut methyl ester different from palm oil methylester and other vegetable-derived ester?

Good quality petroleum diesel has a carbon chain distribution of $C_8 - C_{18}$. Coconut oil itself has C_8-C_{18} . Most other vegetable oils like soybean, rapeseed and palm have $C_{16}-C_{20}$. This means the distillation range of Coco-based Biodiesel is more similar to petroleum diesel. The advantage of coconut oil lies in its superior lubricity, solvency, detergency and combustibility. Use of coco-based Biodiesel provides far superior driving performance than other vegetable-derived esters.