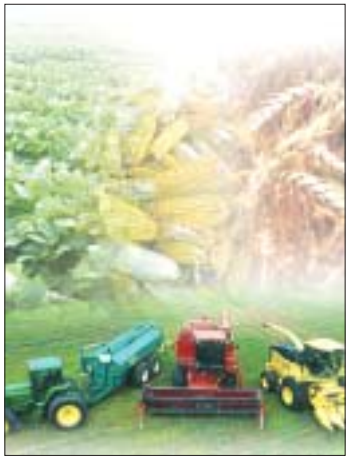
Going Biofuel As Oil Climbs to $50

Marikina, consistently voted one of the country's most livable cities, often shows the rest of Metro Manila what public order and service mean. It was first to clear sidewalks with an ordinance penalizing buying from street hawkers. Or fix traffic by simply disciplining jeepney drivers to load and unload only at designated stops. Or rid itself of rabid stray dogs and cats by hunting down the negligent pet owners. Under ex-Mayor Bayani Fernando, now the Metro Manila Authority chief whom underachieving mayors love to hate, Marikina's frequent flooding was fixed, streets were widened, and fences encroaching on sidewalks were torn down, philstar.com reported.

Under Mayor Mariles Fernando, Bayani's wife, Marikina may well show, the rest of the country this time, what foresight means. She is the first local executive to mull with councilors requiring public utility vehicles to use coconut biodiesel. This, to cope with rising fuel costs and air pollution.

Marikina hosted recently a biofuel seminar of the energy department and the US-Agency for International Development. Biodiesel's attributes were presented to local officials and businessmen. One liter added to a 50-liter full tank (2 percent blend) improved fuel burning, meaning, conserved imported diesel and more engine power. It also declogged pistons and fuel lines, thus promising less maintenance cost. Most of all, because of efficient combustion and biodiesel's formulation, smoke and toxic emission dropped to well below ceilings of the Clean Air Act. This spells instant clearance for vehicle registration by the Land Transportation Office.

Marikina can't do it alone, though. It shares the rest of the metropolis' dirty air. If other cities and provinces go the way of mandatory biofuel use in buses, jeepneys and taxis, the country's health care spending will drop. Experts compute that individuals and the state spend close to P40 billion a year to cure respiratory diseases and cancers caused by vehicle pollution. A massive switch to biodiesel and alcogas from sugarcane also would save dollars from imported fuels.



Ethanol is also being extracted in large amounts from corn for alcogas.

President Gloria Arroyo had directed as far back as 2003 a one-percent mix (half-liter of biodiesel for every 50-liter fill-up) on all government diesel vehicles. Compliance has been spotty, because largely unmonitored. Too, biodiesel is hard to come by. There are only three big manufacturers and then some backyard makers. But brisk promotion by the energy office and the Philippine Coconut Authority are encouraging them to hike output and expand distribution. More and more entrepreneurs are looking into alcogas mass-production as well.

Vehicle owners resist biofuels for two reasons. One is unfamiliarity with the technology. Self-bashing Filipinos sneer that biofuel is just a sly way to boost coconut and sugar trade. A quick check on the Internet will show them, however, that Europe is practically begging Asian countries, including Thailand and Indonesia, to sell biodiesel to meet the continent's emission standards. Coconut is not the only base. Thailand is investing billions of dollars to match Malaysia's palm oil production for biodiesel. It can also be extracted, one liter per plant per year, from oilseed like tubatuba (jatropha) or tangan-tangan (castor bean) that thrive like weeds on hillsides. The US Department of the Navy recently ordered the use of biodiesel from soybean on all its vehicles. The rest of the US Armed Forces, the National Parks Service, and several state universities also are trying out the bean oil. Ethanol is also being extracted in large amounts from corn for alcogas.

Another resistance to biofuels is cost. A liter of biodiesel sells for P65 to P80. Alcogas from sugarcane is largely experimental, so no market price has yet been set. At any rate, jeepney drivers who live from hand to mouth believe the diesel alternative will only add to their operating cost. But they might as well get used to the price.

Biomass 'Clear Winner' In the Face Of Energy Crisis

When Virginia Tech students go home this summer, the administration will decide the fate of the construction of a new campus power plant. There is little doubt that Tech needs additional electricity generation--approximately thirty megawatts--to respond to rising demand. However, controversy exists over which type of power plant to build. Currently, the administration is considering four options: plants that use coal, natural gas, oil and biomass.

The problems of coal are well documented and extend beyond the significant carbon dioxide emitted from coal-fired power plants. Even clean coal facilities produce an immense amount of sludge and release sulfur dioxide, nitrogen oxide, carbon monoxide, particulate matter, mercury and ozone into the atmosphere. A 1996 study undertaken by the Harvard School of Public Health concluded that coal-fired power plants are directly responsible for killing 30,000 Americans every year.

The Clean Air Task Force notes that most of this pollution is concentrated close to where coal is combusted. In other words, the more coal burnt near Tech, the more its residents are incrementally poisoned, collegiatetimes.com said.

Moreover, the mountaintop and strip-mining of coal presents numerous hazards for miners and have been proven to contaminate freshwater ecosystems and ruin habitats. And coal is becoming an increasingly expensive fuel.

During most of the 1990s, Tech paid around $19 per ton. Last year that cost was $37.50, and it is expected to approach $65 for the 2005-2006 academic year.

Natural gas and oil present arguably cleaner alternatives, but are subject to frequent price spikes and interruptions. The Energy Information Administration documented price swings of over $50 per GJ for natural gas during March of 2005. Gray Davis, the former governor of California, recently commented that natural gas prices played a significant role in the 2001-2002 California Electricity Crisis.

In addition, increasing natural gas demand requires the construction of new pipelines and expensive regasification facilities, and only deepens American dependence on foreign countries that supply natural gas such as Algeria, Brunei, Indonesia, Libya, Malaysia, Nigeria, Oman, Qatar and Trinidad and Tobago.

Oil perpetuates the same type of dependence (with a different list of countries), and is becoming much more expensive as prices pass $50 per barrel.

Among these choices, the construction of a biomass facility is clearly the best option. Such a facility could use the abundant sources of woodchips, forest products, poultry waste, trash and agricultural residues available in the community.

Moreover, such a facility could produce the needed 30 MW of electricity while recycling steam waste to produce heat and air conditioning. While a biomass facility would likely cost around $50 million to build and $3 million annually to operate, it would generate $2-4 million per year in steam and chilled water and produce electricity valued at about $4 million. Put simply: the facility would pay for itself in under nine years.

The comparative benefits from a biomass facility are numerous.

The comparative benefits from a biomass facility are numerous. First, unlike coal, which is imported from outside of the state, a Tech biomass facility would create jobs in Blacksburg.

While the operational costs of a biomass facility are comparable to a coal plant, a biomass facility would require dozens of local workers for fuel processing and transportation – jobs that would not be created any other way. Some estimates suggest that such a facility could create over 100 local jobs in Blacksburg alone.

Unlike the combustion of coal, biomass produced electricity does not add to the inventory of global carbon dioxide because it does not release fossilized carbon into the atmosphere. Thus, even though combustion of biomass does release some carbon dioxide, it does not add to global warming.

A 2003 Department of Energy report concluded that "biomass can significantly reduce emissions compared to a coal-only option." Such a facility could also reduce electricity costs by charging tipping fees to pick up waste instead of having to pay for fuel. Since most farmers pay $35 per ton to remove their waste, tipping fees could constitute a significant financial benefit.

Ghana Has 2,000-Megawatt Wind Power

The Energy Commission (EC) of Ghana has disclosed that the country has a total wind power potential of 2,000 megawatts that could be tapped into the national grid for use in the rural areas.

Mr Kwabena Otu-Danquah of the Energy Commission was however, quick to add that Ghana lacked the right legal regime and policy direction to facilitate a comprehensive mix of wind and solar energy use.

He said, according to the US-based National Renewable Energy Laboratory (NREL) and the EC satellite data on Ghana, there was immense potential at Nkwanta near the Ghana-Togo border, the Coastal area in the Accra Plains, especially east of the Meridian, the Kwahu and Gambaga mountains.

Briefing participants at a seminar on the Solar and Wind Energy Resources Assessment (SWERA) Project, Mr Otu-Danquah said the wind map indicated that the Ghana-Togo border has a wind power potential of 9.0 meters per second while the Accra Plains has between 5.5 to 6.5 meters per second and the Kwahu and Gambaga mountains also held 5.5 to 6.5 meters per second, allafrica.com reported.

The SWERA Project is a United Nation's Environment Project Global Environment Facility aimed at promoting the utilization of renewable forms of solar and wind energy.

It is to remove barriers created by the lack of information and supporting more informed decision-making, science and technology based policy that would ultimately increase investors' interest in renewable energy.

Explaining the monthly mean wind speed, Mr Otu-Danquah said the wind speed at the Pute site in the Northern Region is above 5.0 meters per second throughout the year while the Ada site in the Greater-Accra Region for eight months in a year was above 5 meters per second.

The mean speed in Lolonya, on the Ada-Battor road in nine months during the year was also above 5.0 meters per second.

"Indeed, there are wind speeds of over 5 meters per second blow for periods of between 10 hours and 16 hours per day at the three sites," Mr Otu-Daquah added.

Mr Otu-Daquah told the Ghana News Agency that SWERA under the project is helping to assess the overall potential for renewable energy and creating reliable information, and developing information tools for energy planners and project developers, including regional and national maps of solar and wind energy resources. It is also developing a geographical information system interface.

The Project, which started in September 2002 is being funded by an 80,000-dollar grant from the UNEP and would end next year.

Under the project, comprehensive data on solar and wind resources have been compiled including

direct, diffuse, global and latitude tilt solar data from satellite data at 10-kilometer resolution.

Mr Otu-Danquah said global solar resource irradiation was high throughout the country ranging from 4.5 to 6.5 kilowatt per meter per day with a general latitude tilt irradiation equal to global irradiation.

He said direct irradiation is however, low throughout the country but relatively high in the Northern Region with diffuse irradiation high over the entire country.

Explaining the solar resource, Mr Otu-Danquah also told the GNA business desk that with low direct radiation, solar energy technologies that utilize direct radiation to produce energy would not perform well in the country.

"Such technologies are solar thermal systems like concentrators for electricity production, adding that in the North Western corner of the country where direct radiation is the highest, solar concentrators will operate for a maximum period of four months a year.

"All solar energy technologies that use global radiation to produce energy such as PVC's and water heaters would operate efficiently throughout the year in any part of the country."

Mr Tom Hamlin of the Global Environment Facility and SWERA Project Manager said Ghana was far from reality on the use of wind and solar energy mix, "as a lot more work remains to be done before we can touch implementation stage."

He said the wind systems findings are interesting and must be followed earnestly.

Beyond Oil, Gas

Oil, natural gas and coal are our most important sources of energy and the indispensable starting materials for many everyday products, from gasoline to plastics and a variety of pharmaceuticals. Thanks to better exploitation and new discoveries, the estimated worldwide oil and natural gas reserves seem to remain undiminished-a misleading image.

"If we continue at the current rate of use and take into account the growing population on earth," explains George A. Olah (Nobel Prize for Chemistry 1994) in an essay in Angewandte Chemie, "the verified reserves of relatively easily accessible oil will only last for another 40 years." Though hydrogen has so far been assumed to be the alternative energy source of the future, a better solution now seems to be emerging: methanol.

Could stepwise conversion to a methanol economy solve our energy problems? Olah believes so: "In contrast to hydrogen, methanol is an easily obtained liquid energy carrier, suitable as a fuel and also a good raw material for the synthesis of the basic products of chemical industry." Methanol is an optimal "storage medium" for hydrogen, which can easily be retrieved and fed into hydrogen fuel cells. "The next step toward a methanol economy is the methanol fuel cell," says Olah, "these directly convert methanol and air to carbon dioxide and water."

Olah's team, together with scientists of JPL Laboratory of Caltech, developed direct methanol fuel cells that could potentially power mobile phones and computers; the next goal is to drive motor scooters and cars. "In the longer run this method of generating electricity could also be used in power plants," Olah states optimistically, according to chemie.de.

Currently, methanol is still produced from fossil fuels, especially from syngas, a mixture of carbon monoxide and hydrogen derived from natural gas (Fischer-Tropsch chemistry). Olah's group developed methods for the direct conversion of natural gas (methane) into methanol. A true methanol economy could do without natural gas, oil and coal. Says Olah: "Methanol could, in the future, be formed from the reaction of carbon dioxide with hydrogen." Exhaust gases from power plants and many industrial emissions contain considerable amounts of carbon dioxide, which can in future easily be isolated. Rather than costly collecting the greenhouse gas carbon dioxide and storing it for the future, as has been discussed, it could be used in an expedient fashion by conversion to methanol. However, Olah goes one step further, arguing for the use of atmospheric carbon dioxide. But at 0.037%, its presence in the atmosphere is slight, so the success of this concept rests on effective methods of isolation.

Though hydrogen has so far been assumed to be the alternative energy source of the future, a better solution now seems to be emerging: methanol.

Olah's research group is working on their development. "Atmospheric carbon dioxide is available to all people on the earth. The energy needed for methanol production may come from nuclear power plants as well as alternative sources such as solar, wind, and geothermal energy.

The methanol economy could finally free humanity from its dependence on fossil fuels. At the same time, it can diminish the danger of global warming caused by a rising carbon dioxide content in the atmosphere," says Olah.