

Novel Approach to Old Idea

By LeAnne Graves, Editor

ISAS conceptual non-site specific image produced by Gensler

Egypt has a new biofuel plant in the pipeline, and New Nile Co. is adding an element not yet seen in Africa.

Biofuels continue to generate interest throughout the international community. Europe considers the product a sustainable source of energy; the US sees its potential in decreasing the price tag on crude; and other countries are merely focused on its export value. However, for many developing countries, the debate over food versus fuel continues to wage.

First generation biofuels are comprised of sources like starch, sugar, animal fats, and vegetable oil primarily produced from food crops. This has led to concerns throughout the international community forcing second generation biofuels to create a more suitable sustainable energy source without cutting into food supply.

Second generation biofuels, produced mainly from non-food biomass, have the potential to offer greater cost reduction in the longer term, according to the International Energy Association. And as the global demand shifts for more alternative energy means to be incorporated into the energy mix, many are finding themselves forced to step further into the biofuel arena as countries continue to enact energy master plans and set forth other regulations to ensure proper implementation.

The European Commission has already adopted the Biomass Action Plan and the EU Strategy for Biofuels, giving priority to research and development for biofuels and its technology. The Biofuels Research Advisory Council (BIOFRAC) described a vision for the sector for 2030 and beyond. Janez Potocnik, EC's Commissioner for Science and Research, said: "The vision report starts from the assumption that certain objectives can be met more effectively if

pursued in a coordinated manner." Therefore, the vision for 2030 calls for up to one quarter of the EU's transport fuel needs to be met by clean and efficient biofuels. The EC will rely more on domestic production of second generation biofuel feedstock, but still aims to import biofuel feedstock to meet local demands.

And Energy Allied is making sure that it is one of the first onboard with the capabilities to meet the increasing demand, while offering a little extra. The New Nile Co., a seawater project for biofuel production, is a conglomeration involving Houston-based Energy Allied International, the Seawater Foundation (SFE), and Global Seawater, Inc. The project will use integrated biofuels, aquaculture, and agriculture utilizing non-agricultural grade land and untreated seawater.

Disappointment Met with Encouragement

However, before the New Nile Co. came to existence, Energy Allied attempted to tackle the biofuel sector in Egypt by using jatropha. The plant may be used as a biofuel feedstock and has the ability to grow in a wide variety of soils and to withstand long periods of adverse conditions, like the lack of rainfall. The crop has the potential to yield oil for up to 40 years, making it a viable option for Egypt.

The company partnered with the Egyptian Petrochemicals Holding Company (ECHEM) in its first endeavor into the Egyptian biofuels arena. However, Energy Allied met a roadblock as it found that in order to develop large-scale jatropha projects, land ownership issues

All images courtesy of Energy Allied

became too overwhelming of a hurdle. This forced the company to abandon the project.

Then the company stumbled upon Dr. Carl Hodges, founding director and chairman of the Environmental Research Laboratory (ERL) at the University of Arizona. Hodges has spent 25 years researching shrimp farming, high-efficiency solar energy systems, controlled environment agriculture systems, and biospheric systems. He created the SFE and developed seawater farms in Eritrea.

The Eritrean project began construction in 1999 with a huge channel dredged from the Red Sea which provided water for three salt lakes for fish and shrimp farms. Mangroves were planted to shade the shores as the canal also naturally irrigated field crops and then drained into a sea garden park. The park boasted of zero waste with waste from the fish farms used to fertilize field crops, fish skin tanned for leather, and bones and innards mixed into feed for shrimp.



Seawater farms in Eritrea

The main field crop, salicornia, provides a delicacy in its infancy; however, after the plant matures, it is capable of providing biomass. Science and Technology advisor to US Secretary of State and USAID Administrator, Dr. Nina Fedoroff said at the Sustainable Agriculture: The Key to Health & Prosperity event in Virginia from February 18-19, “[Salicornia] is one of the major hopeful crops for biofuels. It really does make a high quality oil.”

Unfortunately, Eritrea’s political climate changed as the country’s president Isaias Afewerki nationalized the project in 2001, causing it to fall by the wayside. Prior to the nationalization, the SFE had employed almost 800 people, shipped one metric ton of premium shrimp a week to Europe and the Middle East, and cultivated 100 hectares of salicornia.

Picking a Location

The project in Eritrea, in addition to a similar project on the coast of Sonora, Mexico that has been ongoing for 30 years, spawned the idea to attempt the project elsewhere. Energy Allied and partners initially began looking into Libya, UAE, and Senegal, but the

company’s regional vice president Tamer Nassar told *Alternative Energy Africa* that the better suited country was Egypt. “With 85 million people, one-third of the population employed in the agriculture sector, a high unemployment rate, and 95% of the land uninhabited, Egypt has the greatest need for this project,” he said.

A different experience arose unlike that of dealing with land acquisitions for jatropha production. The New Nile Co., formed in early 2009, focused its efforts on nine sites that were uninhabitable and fruitless, finally narrowing down the field to one site of extreme interest located in the Sinai. After the Egyptian government approves the 50,000 hectare site, expected to be granted within three months, the project will undergo a \$3-million comprehensive feasibility study lasting approximately three to four months.

The proposed site, situated about 6-7 km inland, will not affect tourism or commercial development. In addition, the project will employ 5,000 locals during the construction phase, create

2,500 permanent jobs, and generate 25,000 indirect jobs with vocational training made available onsite. Much like the Eritrean sea farms, the offshoot canals running about 160 km in length will harvest seafood, and the natural occurring salt tolerating salicornia plant will also be grown. “For every hectare of agriculture, you can produce five hectares of [additional agriculture],” Nassar explained.

The canals will run perpendicular to the river allowing for natural irrigation via gravitational flow. In addition, crop rotation will not be necessary as the saltwater creates nutrients in the soil. The project will also be able to produce animal feed (meat/dairy) and building materials as salicornia produces dry husks which can be used to create particle board. “The products that can be produced from this project are endless,” he said.

Novel Approach

And while the project is gaining speed, funding is still needed to meet the \$750 million required investment. The group is looking into the IFC, African Development Bank, National Bank of Egypt, and private venture capitalists like Lux Capital. When *Alternative Energy Africa* inquired about seeking Chinese investment, especially as the Asian country’s investments into Africa are criticized by many Western investors, Nassar said, “We have no problem with any investor as long as the terms of agreement are met.”

The terms revolve around the company’s main premise to create a project that will be completed from start to finish in Egypt. Unlike



other biofuel projects that grow the feedstock for export to other countries that then turn the crop into biofuels, Nassar stressed, "We are not looking to sell a raw product." He added, "We will develop this from inception to commissioning." Thus, the project is already gearing toward the aviation industry.

Targeting Aviation

The biofuels industry will emerge even more as international airlines are set to join the emissions trading scheme in 2012, and if airlines do not comply, strict penalties will be enforced. The European Union has even mandated that blends must be implemented by 2012 and by 2020; airlines will be unable to land at any EU airport without the proper mixture.

Many airlines have already begun testing and using a biofuel blend such as Virgin Atlantic, British Airways, and Etihad Airways. The Emirati-based Etihad Airways is using the same model as Energy Allied, even using the company as a consultant on its biofuel project. *For more information on biofuels impacting the aviation industry, please see Taking Flight on page 20.*

Nassar said that this is an environmentally conscious project. "Nothing is new here except for how we've packaged it," he said. There will be two products with the nurseries expected to be running nine months after breaking ground and commercial projects after two years. It will take at least one year before start-up can begin once breaking ground. **AE**

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