

Simple, Cheap Alternative To Electricity

Margaret Musisi of Namulonge village in Wakiso was left in a black-out when she could no longer afford the high electricity bills. She resorted to smoky kerosene candles (tadooba) for lighting.

"I had a huge electricity bill, which I couldn't pay," says Musisi. "I resorted to tadooba, but the cost remained high because I would buy paraffin for sh500, which would last only two days and I would spend about sh7,500 per month."

Musisi's salvation came in April when Makerere University researchers under the Centre for Research in Energy and Energy Conservation (CREEC) in collaboration with the German Technical Cooperation (GTZ) and Ultra Tec introduced new technology, Light Emitting Diode (LED) system in her village.

"I'm happy because of such a big relief from high bills," she said. "LED system is cheap since you purchase it once and continue to enjoy cool light. You can even charge your mobile phone."

But Musisi, who is now a team leader in charge of mobilizing residents, is not alone. About 15 homesteads have already been connected in the pilot project spearheaded by the Energy Advisory Project (EAP) in the Ministry of Energy and Mineral Development. More than 56 people have also showed great interest in acquiring the technology they describe as simple and cheap, allAfrica.com said.

Sarah Namirimu, another beneficiary, says she had cut her expenditure on paraffin from about sh9,500 a month to sh2,000.

"We paid sh95,000 in installments for the system," she says. "When fully charged, it goes for about 14 hours without interruption."

LED system is made of small solar panels of five to 14 watts, four to seven amps hour non-refillable battery and one watt lights (bulbs). Unlike ordinary solar or electricity, which can shock, the LED system is user-friendly because of low voltage. Its bluish-white light is conducive for sight compared with the eye-straining

bright colors from incandescent bulbs of 60 or 100 watts.

The system also consumes small amounts of power compared to the ordinary solar. For better results from the torch-like light strategically positioned, a room should have a ceiling and walls painted in bright colors like white.

Richard Okou, a CREEC researcher working on the project says the promotion of LED systems was in line with the Government's plan for renewable energy. It cost between sh250,000 and sh350,000. In comparison, the smallest conventional solar systems cost about sh1m.

"Our target is to promote LED lighting for poor rural households who can't access electricity or afford the conventional solar systems," says Okou. "Considering that Uganda always receives sunshine, it is a cheap system that can be customized to the client's needs."

If adopted, it would lead to sustainable use and protection of the environment.

According to the 2002 population census, over 75% of Ugandan households use tadooba for lighting. The use of electricity is still low, only 7% of households use it.

Similarly, a recent World Health Organisation report on indoor pollution shows that smoke in the home emitted by kerosene for lighting, fuelwood, dung, crop waste and coal causes 1.6 million deaths every year, which is higher than that of malaria.

"Every 20 seconds, someone, especially a child or mother, dies from an illness caused by smoke," says the report.

Citing his experience after a tour of a village in Uganda, German ambassador Alexander Muhlen said indoor smoke posed greater health risks to people in developing countries, where 97% of households use poor technologies for lighting, cooking and heating.

"Indoor air pollution is the deadliest silent killer," he told a regional meeting on indoor air pollution and household energy monitoring in Kampala recently.

Dr. Mohsen Shabana, an Egyptian-born scientist who is one of General Motors' chief engineers, presented the company's vision regarding hydrogen powered vehicles today at the GM sponsored Middle East Forum on Fuel Cells and Hydrogen Economy.

"This conference, first of its kind in the Middle East, is an excellent initiative to promote discussion of the potential of hydrogen as a viable fuel choice for coming generations," said Dr. Shabana. "General Motors' sponsorship and participation in this event reflects its long term strategy and commitment to research, development and technology."

"The next century will be shaped by how effectively and smoothly the world introduces hydrogen as a transportation fuel—we must introduce a renewable energy source in order for world economies to grow, for the growing middle class in emerging markets to have increased wealth, and for people who have dreamed all their lives of owning a vehicle to finally realize that dream," he added.

Dr. Shabana will also be showcasing the GM Sequel vehicle at the conference, which embodies GM's vision of reinventing the automobile with a fusion of technologies that

includes advanced materials, electronic controls, computer software and advanced propulsion, ameinfo.com said.

Shabana explained: "GM's goal is to design and validate a fuel cell propulsion system by 2010 that is competitive with current internal combustion systems on durability and performance, and that ultimately can be built at scale affordably."

One of the key highlights is that the Sequel's performance is achieved with technology available today and does not depend upon some science yet to be invented.

"We've achieved remarkable gains in range and acceleration by using our fuel cell system technology that exists today," Shabana said. "That's a real breakthrough. For anyone tracking the viability of fuel cell vehicles, this is encouraging news."

The Sequel is a major exclamation point for GM's comprehensive global advanced technology strategy that is addressing efficiency and emissions, from today's engine and transmission technology to hybrids and, eventually, fuel cells as the ultimate answer.

The conference, was held at the Dubai Police Academy on December 6 and 7 and brought together a truly global group of company representatives,



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government officials, and academics to exchange ideas and information on the advancements of Fuel Cell technology and the impact of emerging hydrogen economy on the Middle East.

General Motors, the world's largest vehicle manufacturer, was founded in 1908 and has been the global automotive sales leader since 1931.

GM today employs about 324,000 people around the world. It has manufacturing operations in 32 countries and its vehicles are sold in 200 countries. In 2004, GM sold nearly 9 million cars and trucks globally, up 4 percent from the previous year, and the second-highest total in the company's history. GM's global headquarters are in Detroit.

Waste-to-Energy Plans for the UK

The debate over whether waste-to-energy projects should be under the renewable energy umbrella may continue for years. In the mean-

time, waste will continue to build up unabated, and companies will continue to propose new methods to minimize the environmental consequences of disposing of it. A divi-

sion of the Pirelli tire company announced a partnership to move ahead on a waste-to-energy plan in the UK.

Pirelli Ambiente, the company within the

of Pirelli's patented RDF (Refuse Derived Fuel). Under the terms of the agreement, ReEnergy will produce and sell the Pirelli fuel throughout UK. Pirelli Ambiente will also supply the technical assistance necessary for the technology's implementation. As a part of the agreement, Pirelli Ambiente will also evaluate the business development potential of using Pirelli RDF in one of Europe's most interesting markets, as a partial fossil fuel substitute in electricity generation, solaraccess.com said.

In the UK, approximately 35 percent of electricity is produced by coal-fired power plants, compared with approximately 8 percent in Italy. As a part of the agreement Pirelli Ambiente may establish a joint venture with ReEnergy in the UK and subsequently further reinforce its presence in the territory.

Pirelli Ambiente's patented RDF is, according to its definition, a renewable energy source almost entirely derived from the dry fraction of municipal solid waste with the addition of highly calorific components (such as chlorine free plastics and granu-

lated rubber). It is predominantly used in co-firing in partial substitution of coal in already existing industrial facilities such as thermoelectric power plants and cement kilns, without the need for construction of new chimneys.

In Italy, Pirelli's technology has been used for more than two years in Cuneo, where the proportion of energy recovery from municipal solid waste (approximately 32 percent) is higher than both the Italian average (8 percent) and the European average (25 percent).

By providing an effective solution to the problem of waste disposal, the use of Pirelli RDF for partial substitution of coal in existing plants reduces the emissions of nitrogen oxide and carbon dioxide, says the company.

In addition to the environmental advantages, it also offers significant economic benefits: according to a study by the Institute of Energy and Politics of Environment at Milan's Bocconi University, electricity produced with Pirelli's RDF has the lowest production cost among all renewable energy sources.



A waste-to-energy plant

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Scot Power Line Key to Green Energy

Failure to build a controversial new power line could kill Scotland's renewable energy plans "stone dead", green businesses have warned.

Opponents of the line said the larger pylons would ruin the landscape.

But industry forum Scottish Renewables said the 137-mile Beaulieu to Denny upgrade was necessary for the future growth of green energy production.

Scottish and Southern Energy has lodged a planning application for the new electricity transmission line. It said that the current 132 kilovolt (kv) line would not be sufficient to feed power from the growing number of wind and hydro energy sites in the Highlands and islands to the National Grid, bbc.co.uk reported.

The 400kv upgrade plan consists of 600 electricity pylons between Beaulieu in the Highlands and Denny, near Falkirk, running through the Cairngorms National Park and within sight of the Wallace Monument in Stirling.

The larger pylons would reach up to 65 meters high, although there would be 200 fewer than at present.

Outdoor groups and local protesters have called for the transmission line to be buried underground, but SSE claimed the cost implications would be too high.

And Maf Smith, chief executive of Scottish Renewables, said that if work on the power line did not go ahead Scotland's renewable energy industry would be "strangled at birth".

He said: "We believe that Scottish and Southern Energy has put forward a robust proposal that minimizes impact to an acceptable level and is a vital improvement on the existing line it will replace."

'National Strategy'

"This upgrade to the power infrastructure is as fundamental to the economy as our road or rail infrastructure and future investment in renewables is dependent on this outcome."

Peter Pearson, secretary of Stirling Before Pylons, said: "There still isn't an overall energy strategy for Scotland."

"SSE haven't carried out a strategic environmental

assessment which is required under European legislation, and which is currently going through the Scottish Parliament, to justify infrastructure proposals like this."

"Without a national strategy we don't think this line is justified."

Another protester, Caroline Paterson, said: "There is nothing green or sustainable about an increased number of children with leukaemia."

"The SSE's Dr. Keith MacLean said health had not



The power line plans have brought local opposition.

been a consideration in the routing of this line." Independent MSP Brian Monteith, who has protested against the pylons, said: "Maf Smith clearly does not have a house under a pylon or children playing next to one."

"There is clear and unequivocal evidence that pylons are a danger to health and if this grid is to go ahead, all we are asking is that it should be put underground."

Scottish Renewables represents 160 green businesses and organizations.

The plans for the power line, being considered by the Scottish Executive, are out for public consultation until 12 December.

Fuel is the thing with feathers. Hoping to find an efficient way to help power automobiles and trucks, researchers at the University of Arkansas say they have developed a way to convert chicken fat to a biodiesel fuel.

engineering. "Five to 20 percent blending of biodiesel into petroleum-based diesel significantly reduces our dependence on foreign oil."

Mattingly's research allows biodiesel producers to assess different materials to see what works best. Producers will be able to choose the best way to convert different grades of

chicken fat into fuels, according to enn.com.

R.E. Babcock, a professor of chemical engi-

neering, said chicken-fat fuels are better for the environment and the machines.

"They burn better, create less particulate matter and actually lubricate

and clean things like cylinders, pistons and fuel lines," Babcock said.

Traditionally, biodiesel producers have used refined products like soybean oil because they are easier to convert to fuels. However, the refining process makes

soybean oil more expensive—and fuel producers must compete with growers for the oil supply.

During the various chemical processes,

In his studies, Mattingly used high-quality fat (less than 2 percent fatty acid content) and low-quality, feed-grade fat (6 percent fatty acid content) obtained from Tyson Foods Inc. plants in

Clarksville and Scranton. The high-quality fat is more expensive than the feed-grade fat, but both are less expensive than soybean oil.

It took different steps to refine the different fats, but it could be done, Mattingly said. "The project demonstrated that there is a very fine line between facilitating an adequate

reaction and generating so much soap that the biodiesel yield is diminished," Mattingly said. "Basically, deciding which method to use comes down to economics."

Michael Popp, an associate professor of agricultural economics, said it is too early to tell if making biodiesel fuel from chicken fat is economically feasible.

Fuel From Chicken Fat!