

WSSET World Society of Sustainable Energy Technologies NEWSLETTER

Comments from WSSET Members

How to make transport fuel which is carbon neutral from air and water and renewable energy!

INSIDE THIS ISSUE:

Latest news	2
Technology and products	2
Funding & Awards	2
Research and development projects	4



If all the fuel that was burnt was carbon neutral, we would be able to reduce the CO2 content of the Earth's atmosphere from its current level of 380 ppm down to the previous level of 200 to 300 ppm over the next 15 years..

So the challenge is there! Stop burning fossil fuels and use instead a carbon neutral substitute.

.A small group of scientists have been working on this project for 18 months and have come up with a workable answer which is economic and uses raw materials, which have the attraction of being free.

It is called Atmospheric Fuel Synthesis.

The CO2 is extracted from the atmosphere and blended with hydrogen from water via the Fischer Tropsche exothermic catalytic reaction to make HydroCarbonFuel.

The energy cost is a little under 3 KWh per one kW of fuel, compared to say a fossil fuel power station that uses nearer to 4 KWh of fuel to deliver one kW of electricity.

With product development, AFS is expected to provide fuel at a ratio near to two to one.

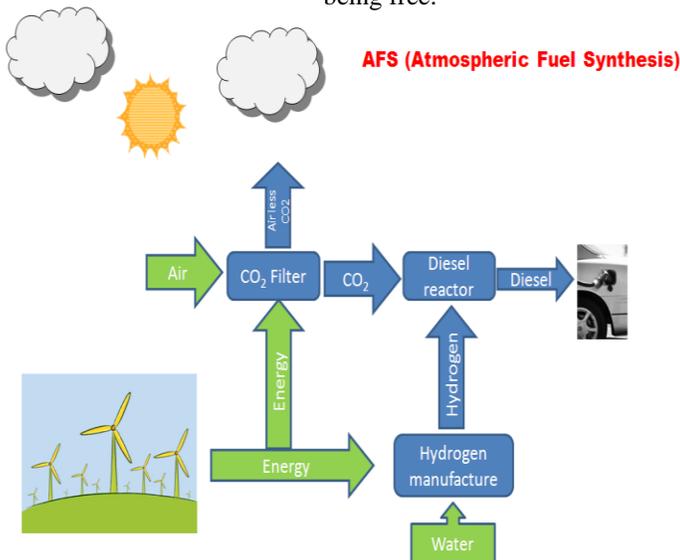
A detailed working paper on AFS has been published and the schematic layout drawing is shown.

Bearing in mind the catastrophic effect of climate change and diminishing reserves of fossil fuel (past Hubbert's peak) we have no alternative but to find a solution as our society depends on immense amounts of energy for all facets of its existence. It take 10 calories of fossil fuel to put one calorie on the table, or put another way, it takes a pint of oil to provide us with one pint of milk. This of course, is totally unsustainable.

AFS gives us the prospect of being energy secure and free of geopolitics. Each country could produce its own fuel supplies without spending hard currency on oil. Employment within each country would also be given a much needed boost.

(Ref. The need for an Atmospheric Fuel Synthesis (AFS) route to aviation fuel by J Barton, D Benton and R Monkhouse)

*Professor Tony Marmont,
 Beacon Energy Ltd, UK.*



WSSET - New Industrial Members

- [Pure Energy Centre Ltd](#)
- [Plogg Ltd](#)
- [Carbon Legacy Ltd](#)
- [Zenex Ltd](#)
- [Gleeds Ltd](#)
- [Oxfordshire Wood Heat Ltd](#)
- [Emnet Ltd](#)
- [Fresh Air Systems Ltd](#)



Latest news

The breakthrough in commercial use solar energy !

The most efficient solar cell in the world!

Efficiency = 6.2

"The highest number reached by any single-layer plastic, organic photo-voltaic solar cell created in the world to date."

The teams of scientist, led by Lee Kwang-hee at the Gwangju Institute of Science and Technology in the South Korean have developed a highly efficient plastic-based power cell, which can take off the photo-photovoltaic activities of plants.



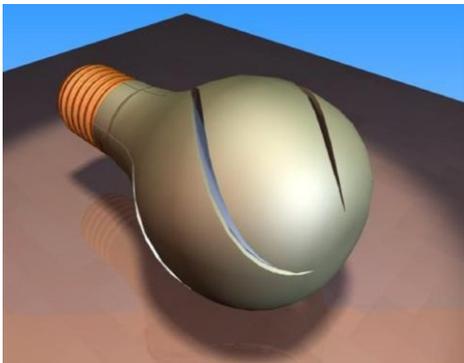
The novel solar cells developed reached an unprecedented energy efficiency rate of 6.2 per cent.

"This is the highest number reached by any single-layer plastic, organic photo-voltaic solar cell created in the world to date and should greatly help commercial use of power generation using sunlight," Lee, a material science professor at the state-run laboratory, said. The scientists said they used a new material that has "open circuit voltage" properties and titanium oxide to bring about high efficiency. And the breakthrough has been confirmed by the US National Renewable Energy Laboratory.

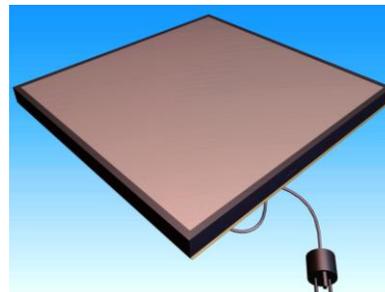
Technologies and products

NEW COMPANY LIGHTS UP NOTTINGHAM

Invest in Nottingham, the inward investment agency for the Greater Nottingham region, has successfully secured new business premises for lighting company LEDinLight.



The Company is developing a new range of LED lighting that will be able to replace fluorescent lighting without changing the fittings. The LED lights not only help reduce energy consumption by 50% but can also have 10 times longer lifespan compared to fluorescent lights. Current environmental issues businesses face and reduce high energy consumption.



Graham Chapman, portfolio holder for Economic Development, said "LEDinLight is addition to the already strong technology sector in the city. "The fact that they have been able to work with the University on developing new products and link into the local support network is a great testimony to other businesses looking to invest in Nottingham"

For more information about LEDinLight visit www.ledinlight.co.uk or contact for Eva Ottosson on 07535408971 or email eva.ottosson@ledinlight.co.uk.

FUNDING AND AWARDS

- 1- Technology Strategy Board: Design & Decision Tools for Low Impact Buildings
JUNE 2009 COMPETITION FOR FUNDING, see www.innovateuk.org
- 2- Specialist Recruitment Hays Sponsors the Guardian Public Services Awards 2009
(sustainability): <http://www.hays.com/sales/guardian-psa-awards-2009.aspx>

....Next Page

What's New in Solar Thermal by Eric R Hawkins

Introducing into the Global market the brand New Thermaltricity Self Build, DIY 100% Solar

This, advanced super heat pipe design, freeze free system uses an existing open or unvented hot water tank.

The DC 12 volt pump, hard wired to a DC digital controller (power consumption 1 watt) is powered by a 20 watt laminated PV panel.



The above installation was begun at 9.30 am and was all completed by 3.45pm the same day.

The proposed re-seller price that gives the selected importer a 30% margin after all imported/landed costs into a UK warehouse, with a 10% profit for the reseller is £1,400 + VAT.

This evacuated super heat pipe thermal collector is offered in kit form through a selected importer who sells the kits on to qualified trained solar sales/installer businesses.

The time it takes to assemble these 8 or 12 tube modules is 20mins by 1-2 persons in their workshops prior to taking them pre-assembled to place of installation.

This collector competes with the likes of the German Ritter manufacture, but the key differences are that it uses a new super high temperature heat pipe, not a water filled copper tube collector with tubes to reduce heat losses.

On the performance side, this exclusive



thermal collector has no brazing points throughout the heat exchanger design, which is just a 22mm straight piece of copper pipe, nothing more.

The principle market for this smaller modular collector is the domestic sector. The existing hot water tank would be used thus providing a large cost saving.

The collector will be plumbed directly into an existing or replacement tank with no need for any glycol protection. This increases efficiency by a direct flow of solar heated water from the 22mm copper heat exchanger through flexible stainless steel pipe to the flow and return points designated to the cylinder.

There is a large potential market for this simple, low cost package for housing associations where cost is a primary consideration. Furthermore, there is no need for the copper vented cylinder to be changed or drained down, if in perfect working order.

The big difference with this type of collector compared to conventional flat plate even many evacuated tube collectors where a water fluid is the main heat transfer source, is that it doesn't need 70% of the components that conventional systems need, but more important no need for glycol and the 3-4 year service of such a system to replace this material.

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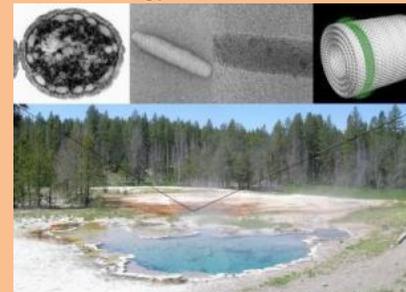
Web site details are www.suntech-solar.com www.jayhawk-int.com

FUNDING AND AWARDS

- 3- Energy Globe Awards 2009
<http://www.energyglobe.com/energy-globe-award>
- 4- RCUK China Office Support UK-China Summer Schools programme. See
<http://www.rcuk.ac.uk/news/080122.htm>
- 5- **FP7 Call for Proposal:**
PEOPLE Calls: FP7-PEOPLE-2009-IIF
Marie Curie International Incoming Fellowships (IIF)
Deadline: 18 August 2009 at 17:00:00 (Brussels local time)
<http://cordis.europa.eu/fp7/dc/index.cfm?fuseaction=UserSite.PeopleDetail>

New energy source - bacteria harvest light!

An international team of scientists has determined the structure of the chlorophyll molecules in green bacteria that are responsible for harvesting light energy. The team's results one day could be used to build artificial photosynthetic systems, such as those that convert solar energy to electrical energy.



The image shows a hot spring in Yellowstone National Park, Montana, a site where bacteria containing chlorosomes can be found in the brightly colored mats

For more information visit:
<http://www.sciencedaily.com/releases/2009/05/090504171947.htm>

Debasish Choudhury

Research and Development Project

A Novel Multi-Curved-Surface Trough Solar Concentrator

In the area of high temperature solar thermal applications, the trough parabola concentrator is one of the most widely used and mature technologies. However, the conventional solar trough parabola concentrator has two shortcomings: (1) the focal line is above the concentrator, so the receiver will have the shadow on the reflective surface; (2) a very accurate tracking system and a perfect parabolic contour are required.

In order to enhance the merit of the conventional trough solar parabola concentrator and reduce the requirement of the high tracking accuracy, a novel multi-curved-surface trough solar concentrator has been successfully developed. This new concentrator has a characteristic of forward focusing with the focal line at the bottom of the trough.

This is beneficial for the installation and insulation of the receiver, and the shadow on the reflective surface is avoided.



Fig. 1 The photo of the novel trough solar concentrator

The new trough solar concentrator consists of a new compound parabolic concentrator, two secondary reflection flat mirrors, a parabola on the bottom and a high temperature solar energy receiver. The solar energy receiver in the new

trough can accept the reflected solar radiation from both upside and downside so that the receiving efficiency is enhanced. The reflected solar radiation is absorbed on the receiver to heat the working medium inside. The near market prototype new trough solar concentrator has been developed as in Fig. 1. The experimental results show that the system can have an efficiency of about 40% for the 120°C operating temperature.

It can be used effectively on the solar space heating in winter and solar air-conditioning and desalination in summer. Even more, it can be used to provide the high temperature thermal energy for cooking. So, it is widely promising.

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A Solar Tracking System for a Mini-dish Concentrator

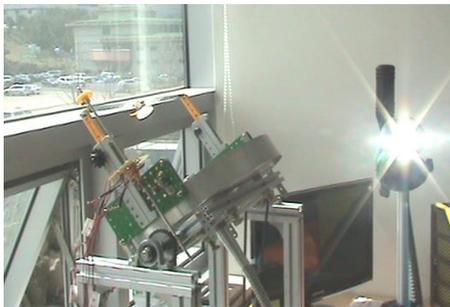


Fig. 1 A daylighting system with a solar tracking mini-dish concentrator

A mini-dish solar tracking concentrator can be used to concentrate sun rays into a beam of high density sunlight, which can be used for indoor lighting or power producing systems depending on its ultimate utilization. The success of these systems heavily depends on the accurateness and manageability of the solar tracking mechanism used to follow the sun's daily movement in a continuous manner. To achieve this, it is crucial to design (establish) a reliable logic of sun tracking as well as its implementation using various mechanical and electronic components applicable in different ways. Because its

motion control logic (software) needs to be flexible, easy to use, and integrate well with other I/O pieces that make the system, a complete multidimensional analysis has to be carried out in its design of a precise and robust solar positioning system.

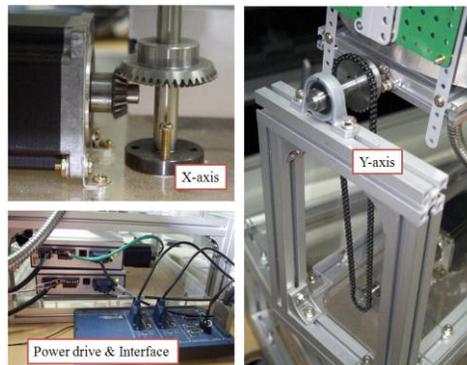


Fig 2. Some major components of the solar tracking

Among various options, LabVIEW offers an ideal combination of flexibility and ease-of-use in developing a solar tracking system. Real-time solar positions, which vary with GPS's data, are constantly monitored and simultaneous system control is made possible

by a chain of operating modes between the open loop and closed loop when required. A number of CdS sensors could be used for the closed loop feedback control by playing a key role in maintaining its accurateness in solar tracking despite occasional gear backlashes due to strong winds or other causes.

The solar tracking system below is made with two driving gears for a double axis control. One tracks the change in the solar azimuth angle (horizontal movement) and the other follows the vertical movement of the sun (i.e., the solar altitude). Each axial movement is directed by a stepping motor attached to it whose resolution is 25,000(step angle 0.0144°) enabling a precise control.

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