

WSSET

World Society of Sustainable Energy Technologies

NEWSLETTER

Featured article



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Featured article

SET 2014 – Geneva, Switzerland

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The 13th International Conference on Sustainable Energy Technologies (SET 2014)

The 13th International Conference on Sustainable Energy Technologies will be held from the 25th – 28th August 2014 Geneva – Switzerland. SET 2014 is a multi-disciplinary international conference on the sustainable energy sources and technologies.

The conference will provide a forum for the exchange of latest technical information, the dissemination of the high-quality research results on the issues, the presentation of the new developments in the area of sustainable energy, and the debate and shaping of future directions and priorities for better environment, sustainable development and energy security.

SET 2014 aims at the scientists, industrials and politicians and will provide a forum for the exchange of latest technical information, the dissemination of the high-quality research results on the issues, the presentation of the new developments in the area of sustainable energy, and the debate and shaping of future directions and priorities for better environment, sustainable development and energy security.

Symposium topics include:

- Renewable Energies (E1)
- Energy Conversion (E2)
- Energy Storage (E3)
- Energy Technologies (E4)
- Policies & Management (E5)

Unfortunately, the last call for abstracts has now closed. For those of you who have already submitted abstracts, the deadline for full manuscripts is 30th June 2014. The HES-SO (University of Applied Sciences and Arts Western Switzerland) and WSSET (World Society Sustainable Energy Technologies) look forward to welcoming you to SET 2014, August 25 to 28, 2014 in Geneva, Switzerland.

SET 2014 website: <http://set2014.hes-so.ch/fr/set-3085.html>

SET 2014 registration: <http://set2014.hes-so.ch/fr/fees-3141.html>

Articles WSSET recommends

ONYX SOLAR'S PHOTOVOLTAIC SOLUTIONS & LUCIA BUILDING

Onyx Solar is a Spanish headquartered company devoted to the design and manufacture of **high efficient, cutting-edge, photovoltaic glass** for Building Integrated Photovoltaic solutions (BIPV). Its multifunctional solutions combine both **active properties and passive ones**, replacing conventional constructive materials for sustainable, efficient ones that allow each building to generate its own free and clean electricity from the sun. This **multifunctional BIPV solution** allows; the entry of natural light, provides both thermal and sound insulation, filters out harmful radiation (absorbing ultraviolet and infrared radiation), produces clean free energy thanks to solar power (avoided CO2 emissions) and features an innovative, customised design which can be integrated perfectly into any type of building.

Onyx develops photovoltaic tailor-made solutions for ventilated façades, brise-soleils, canopies, skylights, curtain walls and even photovoltaic walkable roofs and floors.

The **“Edificio Lanzadera Universitaria de Centros de Investigación Aplicada”** known LUCIA, is a newly constructed building that hosts the investigation facilities for nutrition and dietetics at Valladolid University, Spain.

It is designed as a **bioclimatic zero-emission building**, with different active and passive sustainability measures. The energy is produced through a biomass tri-generation system that provides the electricity, heating, hot water, and air-conditioning. Photovoltaic energy and geothermal wells are also used. All the energy sources used are renewable.

The building can thus be said to have a **ZERO CO₂ balance**. Onyx Solar has collaborated in this project integrating two photovoltaic glass skylights with a total surface area of 124 m², a total installed power of 5.2 kWp and an annual energy generation of 5,552 kWh that avoids the emission of 3.7 tons of CO₂.

The building has applied for LEED Platinum (Leadership in Energy and Environmental Design) certification as well as the highest “four leaf” rating in the Spanish VERDE (GBCEspaña) green building system.

What do our Onyx Solar solutions provide?

One of the most efficient energy saving methods is allowing natural daylight illumination inside the building. Our semi-transparent photovoltaic glasses reduce the artificial illumination necessary to light up an interior space and they perform as a solar filter, absorbing most of the infrared and ultraviolet (UV) radiation. In addition, the gas spacer included in the glass configuration optimizes the thermal properties of the product. In other words, a photovoltaic glass provides multifunctional solutions by which not only on-site electricity is generated, but also allows natural illumination through solar control improving the inner comfort of the inhabitants of the building and prevents the premature aging of the materials. For more information, please email: info@onyxsolar.com or visit the website at www.onyxsolar.es



Articles WSSET recommends

THE BRITISH COUNCIL RESEARCHER LINKS SCHEME – Mahmoud Shatat

Department of Architecture and Built Environment, University of Nottingham

The British Council has launched a new five-year programme to encourage international research collaboration between ambitious young researchers from the UK and eighteen countries around the world.

The programme, 'British Council Researcher Links' provides opportunities for early career researchers from the UK and internationally to interact, learn from each other and explore opportunities for building long-lasting research collaborations.

Sustainable Energy Technologies in the Built Environment Workshop

Under the British Council Researcher Links scheme, a workshop on Sustainable Energy Technologies in the Built Environment was held at the Istanbul Technical University on the 24 to 27 March 2014.

The workshop was coordinated by the University of Nottingham, Liverpool John Moores University, Newcastle University, Istanbul Technical University and Innovative Green. More than 25 researchers from the UK, Turkish and Malaysian universities participated in this workshop. The workshop covered a wide range of topics related to sustainable energy technology, renewable energy, water scarcity, and solar powered water desalination in the Built Environment in addition to the climatic change issues. All researchers presented and discussed various research interests in the Built Environment and they initiated strong links for current and future collaboration.



Workshop on: Solar and Wind Energy Systems

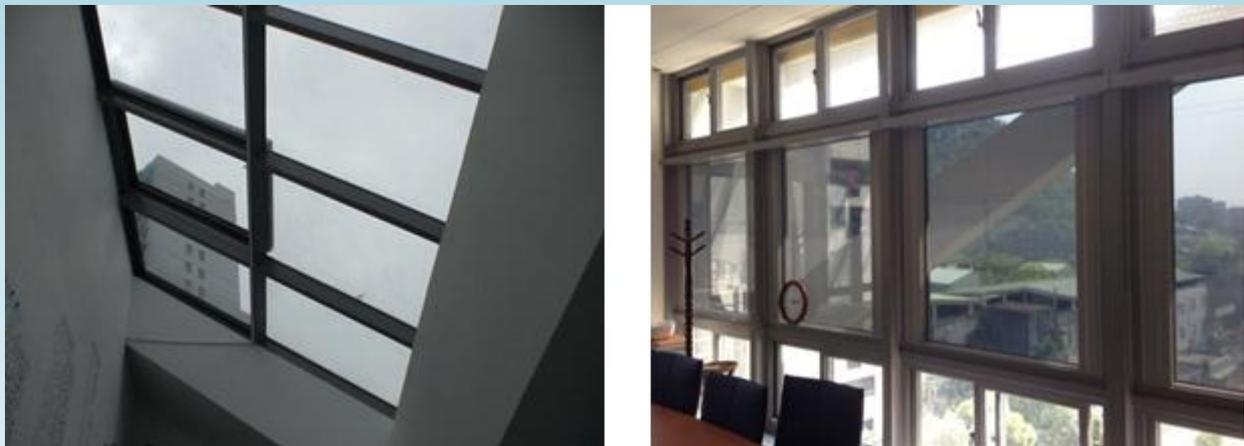
Under the British Council and the Egypt STDF (Science and Technology Development Fund) Researcher Links scheme, a workshop on Solar and Wind Energy Systems was organized and hosted by the University of Nottingham on the 31 March to 04 April 2014. The workshop was coordinated by the University of Nottingham, the Egyptian universities, and Innovative Green. Significant contributions from leading researchers Prof. Saffa Riffat and Dr Siddig Omer (University of Nottingham) have been provided. More than 30 researchers from the University of Nottingham, Loughborough University in the UK and a number of Egyptian universities participated in this workshop. The workshop covered a wide range of topics related to sustainable energy technology, solar energy, and photovoltaic technologies in addition to the low carbon building technologies. All researchers presented and discussed various research interests in the Built Environment and they initiated strong links and mutual collaboration. For more information, please contact Dr Mahmoud Shatat at mahmoud.shatat@nottingham.ac.uk



Articles WSSET recommends

PHOTOVOLTAIC INSULATION GLASS - Prof. Chin-Huai Young and Prof. Saffa Riffat

Zero Energy Buildings (ZEB) will be widely used in the future as they can supply their energy without power from the main grid. In order to reach this target, it would be necessary to construct glazing materials to produce both high solar power and also possess high insulation to reduce the energy consumption in buildings. The Photovoltaic Insulation Glass (PVIG) developed by the authors meets these requirements. The outer nano-material layer can reduce the light reflection and gain more sunlight into the A-Si/ μ C-Si thin film; at the same time the layer of reflective Low-E thin film at the back of A-Si/ μ C-Si thin film reflects the Infrared into the A-Si/ μ C-Si thin film to gain more solar power. Meanwhile, the two layers of A-Si/ μ C-Si thin film and reflective Low-E thin film can cut most of the UV and Infrared lights to provide a good insulation for reducing the air conditioning energy consumption in summer and heating consumption in winter time. According to real house testing results carried out in Taiwan, the PV Insulation Glass can generate 82 W/m² solar power and reduces the air conditioning load by 60% in the summer and heating consumption by 21% during the winter compared with normal glass.



The Photovoltaic Insulation Glass could be applied on skylights, vertical windows and glass curtain walls for solar power generation and energy saving. It could be also widely applied on the Zero Energy Development (ZED) in a district or low/zero carbon villages. Further information about this innovation technology is give in <http://www.hisg.com.tw> or contact Prof. Chin-Huai Young, The University of Nottingham by 01157484053 or chin-huai.young@nottingham.ac.uk

Articles WSSET recommends

THE LATEST INNOVATIONS FROM ENVIROVENT - EnviroVent

EnviroVent designs and manufactures their award winning Lifetime Range® of energy efficient ventilation solutions at their Harrogate factory in North Yorkshire. From extractor fans and Positive Input Ventilation Units (PIV) to sophisticated heat recovery systems, the company develops sustainable products designed to last the lifecycle of a building, all engineered with recyclable components. Over the last 18 months, EnviroVent has launched the following innovations:

1) The heatSava

The heatSava is a through- the- wall Single Room Heat Recovery Unit (SRHR), ideal for retrofit and new build projects. Designed for people who are looking for new and innovative ways to save energy and money, the unit recovers up to 75% of heat that would normally be lost through extraction whilst providing continuous all year round good indoor air quality.

The heatSava works by continuously extracting stale, moist air which passes over a high efficiency tubular heat exchange cell. The cell has been cleverly designed to allow the air to cyclone around the barrel, just like a corkscrew, retaining the heat from the extracted air before it reaches atmosphere.

Articles WSSET recommends

At the same time, fresh air from outside is supplied through tubes where it collects up to 75% of the heat from the extracted air before it is returned back into the room – offering an energy efficient alternative to traditional extract ventilation. The unit has an automatic summer bypass which prevents warmer air from entering the home during the summer months and it also incorporates a frost protection function which protects the cell in the winter months.

The heatSava is quick and easy to fit and is available in the following two sizes:

- 100mm for bathrooms (low voltage version is optional) and WCs
- 150mm for kitchens and utility rooms

Extremely practical, the unit can utilise an existing extractor fan wall sleeve or be installed into a new wall. The heatSava fits neatly into almost any wall thickness - the heat cell comes in four different lengths to suit wall depths of 310mm, 430mm, 500mm and 600mm. What's more, it can be fitted into four different positions through 360 degrees, horizontally or vertically – good news for installers on jobs where space is limited.



heatSava – how it works

2) The energoSava 250 - MVHR

The energoSava 250 is a compact whole house heat recovery system designed for smaller houses and apartments where space is limited. Powered by a low energy EC motor and achieving up to 91% thermal efficiency with a low Specific Fan Power of 0.59% W/l/s, the unit performs with exceptional efficiency and is Energy Savings Trust Best Practice Performance Compliant.



energoSava 250 MVHR

Designed as a one man installation process this lightweight unit fits into the space of a standard kitchen cupboard or loft space. It can be vertically or horizontally mounted and it is also left and right hand reversible – a handy feature for busy fitters. The energoSava 250 comes with a summer bypass as standard and is SAP Appendix Q eligible.

For more information about EnviroVent's product range please visit www.envirovent.com or contact 01423 810810

Articles WSSET recommends

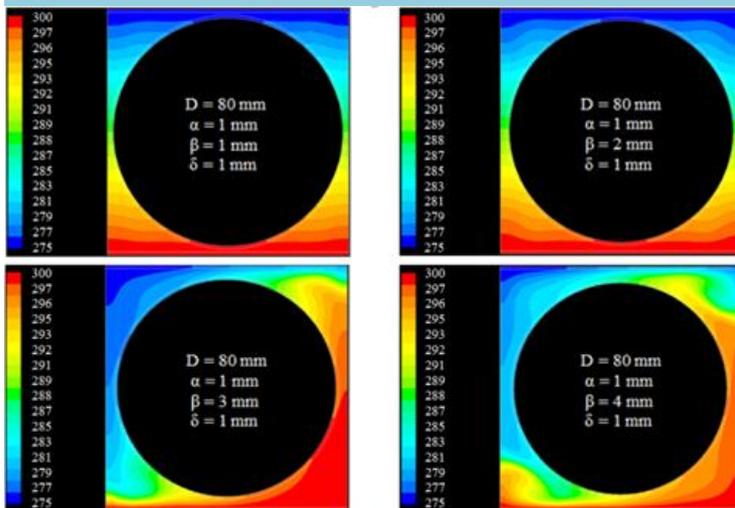
TOWARD INNOVATIVE GLAZING TECHNOLOGIES FOR LOW-CARBON BUILDINGS: VACUUM TUBE WINDOW – Erdem Cuce and Saffa B Riffat

Current conventional residential windows are responsible for around 47% of the heat loss from building envelopes. Due to the significance of windows in reducing the heat requirement and energy consumption in buildings, considerable attention has been given to improving their performance. A patented window technology holds the promise of drastically reducing heat gain and loss attributed to windows as well as increasing the overall energy efficiency of buildings. In this respect, a new concept in glazing technology named vacuum tube window has been recently developed by Professor Saffa Riffat and his research team at the University of Nottingham. Vacuum tube window is based on the integration of evacuated glass tubes and a double glazed frame as illustrated below.

The glass tubes at a particular vacuum pressure are fixed between two glass window panes and for the external connection between vacuum tubes, silicone sealant is utilised. The gap between the vacuum tubes and the glass window panes is filled by Argon inert gas. It is well-known in literature that heat transfer through conduction and convection are eliminated in vacuum media, thus heat is only transferred by thermal radiation. On the other hand, thermal radiation is usually neglected in heat transfer analyses when the temperature difference between the surfaces is insignificant. This phenomenon is the underlying reason of the vacuum tube window technology. Thermal performance assessment of vacuum tube window has been carried out both theoretically and experimentally, and some characteristic results are given in below.



Prototype of the vacuum tube window



CFD model for the vacuum tube window

The overall heat transfer coefficient (U-value) of the vacuum tube window essentially depends on design parameters such as pane thickness (δ), tube thickness (α), tube diameter (D) and Argon gap (β). Tube diameter is a crucial parameter on the performance characteristics of vacuum tube window. For $\alpha = \beta = 1$, U-value has been found to be less than 0.4 W/m²K for the tube diameter greater than 60 mm. In other works, optimized tube diameter has been found to be 60 mm for lighter construction and better thermal performance. The gap between vacuum tubes is a crucial parameter on total heat loss and U-value of the vacuum tube window.

For greater values of β than 3 mm, natural convection dominates inside the window and conductive effects become less important which results to higher U-values. Pressure level has a dominant impact on thermal characteristics of the vacuum tube window. Type of the inert gas is also important in terms of total heat loss from the vacuum tube window. Argon and air have been investigated and the results have shown that Argon gives notably better performance than air. Other types of inert gases can be analysed through a multi-regression analysis for the optimum data.

Overall, very promising U-values can be achieved using vacuum tube windows if the design parameters are determined appropriately.

The authors would like to thank the Department of Energy and Climate Change for their financial support of the project.

Conferences WSSET recommends

- **9th Annual International Symposium on Environment**
12th – 15th May 2014, Athens, Greece
<http://www.atiner.gr/environment.htm>
- **1st International Conference on Renewable Energy Gas Technology**
22nd – 23rd May 2014, Malmo, Sweden
<http://regatec.org/>
- **Global Conference on Global Warming-2014**
25th – 29th May 2014, Beijing, China
<http://www.gcgw.org/gcgw14/index.php?conference=gcgw&schedConf=gcgw14>
- **6th International Conference on Applied Energy**
30th May – 2nd June 2014, Taipei, Taiwan
<http://www.applied-energy.org/CMS/index.php?m=content&c=index&a=show&catid=6&id=25>
- **7th International Ege Energy Symposium & Exhibition (7th IEESE)**
18th – 20th June 2014, Usak, Turkey
<http://www.ddamt.org/conference/symposium-1.html>
- **International Conference on Water Resource and Environmental Protection (WREP2014)**
7th – 8th June 2014, Hong Kong, China
<http://www.wrep.org/>
- **3rd IIR International Conference on Sustainability and the Cold Chain**
June 2014, London, UK
<http://www.ior.org.uk/iccc2014>
- **6th International Conference from Scientific Computing to Computational Engineering**
9th – 12th July 2014, Athens, Greece
http://www.scce.gr/index.php?option=com_content&view=article&id=301&Itemid=102&lang=gr
- **13th International Conference on Sustainability Energy Technologies (SET 2014)**
25th – 28th August 2014, Geneva, Switzerland
<http://set2014.hes-so.ch/fr/set-3085.html>
- **International Symposium on Green & Sustainable Technologies**
30th September – 3rd October 2014, Jalan University, Malaysia
<http://www.utar.edu.my/conference/index.jsp?catid=2770>
- **4th International Conference on Nuclear & Renewable Energy Resources**
20th – 23rd October 2014, Antalya, Turkey
<http://nurer2014.org/>
- **5th International Conference on Engineering and Sustainability**
4th – 5th November 2014, Gaza, Palestine
Email: ICES5@iugaza.edu.ps
- **International Conference Ammonia and CO2 Refrigeration Technologies**
16th – 18th April 2015, Ohrid, Republic of Macedonia
- **17th International Conference on Emerging Nuclear Energy Systems**
10th – 15th May 2015, Antalya, Turkey

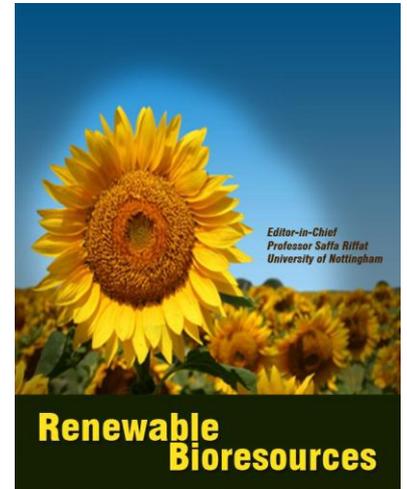
Journals WSSET recommends

Along with the successful *International Journal of Low Carbon Technologies* (<http://ijlct.oxfordjournals.org/>), Professor Saffa Riffat would like to invite you to submit articles to his newest Journal:

Renewable Bio-resources (<http://www.hoajonline.com/renewablebioresources>)

Scope of the journal - As global energy requirements change and grow, it is crucial that all aspects of the bio energy production process are streamlined and improved, RENEWABLE BIORESOURCES emphasises, on the advanced applications of biotechnology to improve biological ecosystems through renewable energy derived from biological sources.

Articles related to the topics of renewable bio resources are all welcome, and should be submitted using the above link.



Contributing to WSSET newsletters and e-bulletins

All WSSET members are kindly invited to submit articles for publication in future WSSET newsletters. Articles can be on a range of topics surrounding the word of sustainable energy technologies. With over 1000 active members, the WSSET newsletter provides a great opportunity to publicise new ideas, technologies or products – all free of charge!

Articles should be no more than 400-500 words and one or two photographs would be very much appreciated. Submissions should be emailed to secretay@wsset.org

Furthermore please contact secretay@wsset.org regarding any conferences, seminar or symposiums relating to topics of sustainable energy technologies that wished to be advertised in the newsletter.

Once again WSSET wishes to thank the continued support of its members.

Along with LinkedIn, WSSET has recently joined the social network Facebook. Being connected with WSSET on Facebook is an effective way of getting in touch with members from both academic and industrial backgrounds, finding the latest updates and news from WSSET and get the latest updates and news of up-and-coming events. Follow us at www.facebook.com and search *World Society of Sustainable Energy Technologies*.



Donations are welcomed and greatly appreciated!

We would like to remind our members that WSSET is a non-profit organisation, hence providing free membership. We would not be able to play a significant role in consolidating practical partnerships between academic and industrial organisations without the help of our members.

Whether you would like to get more involved or contribute financially, please get in touch with us at secretary@wsset.org.

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