World Society of Sustainable Energy Technologies

NEWSLETTER

Volume 13, Issue 1, January 2021

Inside this issue

SET2021 - *cover page*

~~~~~ ~~~~~ ~~~~~ ~~~~~

Articles

An innovative semi-transparent thin film photovoltaic /thermal air collector with vacuum insulated layer (PV-VG/T-air) - *page 2*

Utilization of controllable two-phase loop thermosyphon in a cool-storage refrigerator – *page 3*

Freshwater absorption type HDH system completely driven by solar energy: an industry demonstration - *page 4*

A novel integration of radiative cooling into photovoltaic/ thermal panel in buildings by applying a spectrally selective micro/nano coating – *5-6*

Development of concentrated solar thermal technology integrated with vanadium dioxide-based thermochromic coating – *pages 6-7*

~~~~~ ~~~~~ ~~~~~ ~~~~~

Other News

WSSET Awards – *page 8*

5th WSSET Innovation Awards 2021 - *page 8*

RUSHLIGHT SHOW – 10-11 MARCH 2021: The 12th Rushlight Show – *page 8*

~~~~~ ~~~~~ ~~~~~ ~~~~~

Associated Journals: discount on OA publication fees for WSSET members in IJLCT & FC&E - *page 9*

~~~~~ ~~~~~ ~~~~~ ~~~~~

Important Notices – *page 10*

SET2021: Istanbul, Turkey - Call for Papers

SET2021 will be held in Istanbul, Turkey, from 17th to 19th August, 2021. Hosted by the University of Nottingham, the World Society of Sustainable Energy Technologies, Halic University and Sunum Engineering and Education, **SET2021** will take place at the CVK Park Bosphorus Hotel in the heart of Istanbul. Istanbul is one of the most popular cities in the world to visit and is spread over an area of 8500 square km: 150 km long & 100 km wide.

Deadline for abstract submissions: Monday 29 March 2021

Please submit your abstracts on EasyChair here: set2020.org/submissions/. This year for the first time we have an 'Early-Bird' rate so that you can save €80 on all types of registration fee if you register and pay before 14th June 2021, so get your abstracts in now and arrange your funding in plenty of time. To register, visit http://set2020.org/registration-and-fees/. WSSET members benefit from a 20% discount. Pre-registration will start for early arrivals in the afternoon of Monday 16th to avoid the rush the following morning. For more information about this prestigious conference, visit set2020.org

Deadline Date	Action
Monday 29 March 2021	One page abstract submission
Monday 31 May 2021	Full manuscript submission;
Monday 14 June 2021	Deadline for 'Early Bird' registration
Monday 10 July 2021	Submission of revised accepted papers
Monday 2 August 2021	Registration & payment deadline for paper presentation and conference attendance
Monday 9 August 2021	Registration and payment deadline for attendance only – without paper/poster presentation

Online lectures a success!

Since July 2020, we have been organising lectures on Zoom. By popular demand, there will be more online lectures from February 2021 on a bi-monthly basis. The first of these will be on Thursday 18 February 2021 at 9am (GMT).

Many thanks for your support.

Volume 13, Issue 1, January 2021

An innovative semi-transparent thin film photovoltaic /thermal air collector with vacuum insulated layer (PV-VG/T-air)

Hasila Jarimi[1*] and Saffa Riffat[2]
[1]Solar Energy Research Institute, National University of Malaysia, 43600 Bangi, Malaysia
[2]University of Nottingham, NG7 2RD, UK

This article presents an innovative photovoltaic/thermal air solar collector using a semi-transparent thin film PV glazing insulated with a vacuum layer called PV-VG/T air (See Figure 1). In addition to high-grade electricity production, the proposed PV-VG/T-air collector enables the production of hot air or pre-heated water (via heat exchanger). Unlike the conventional PV/T solar air collector with an opaque PV panel as the absorber, PV-VG/T-air was designed with the following key innovations:

1) The PV glazing which is made of transparent amorphous-Si (α-Si) or micro/amorphous-Silicon Crystalline has a certain level of transparency (i.e. 20%- 40%) depending on the energy needs and application. This implies that, as well as absorbing and converting sunlight into electrical and thermal energy, the selection of this module type also allows light to pass through the panel and hence increase the amount of the heat trapped in the air channel;

2) Thin film PV glass as the PV panel will increase the surface area of the absorbed solar radiation that will be converted into useful electrical energy (i.e. packing factor of 100%);

3) In a conventional PV/T air solar collector, air with low specific heat capacity will not perform well in cold climatic conditions. In our design, the PV-VG part will act as the glass cover for the collector system and the vacuum insulated layer as low as 0.1 Pa will significantly minimise the heat loss from the air channel. The trapped heat will then be absorbed by the working fluid (air) and consequently be converted into useful thermal energy

4) The slim features of PV vacuum glazing component reduces materials required for the solar collector-light weight. Researchers at The University of Nottingham (Jarimi *et al.,* 2020) have investigated the novel component of the thin film PV vacuum glazing (PV-VG), Figure 1b.

The PV vacuum glazing comprises of a low-emissivity coated glass and a thin film PV glass separated by a 0.3mm vacuum layer supported by a series of support pillars. The preliminary testing of the sample under real conditions have indicated that, at low ambient temperature of approximately 12˚C, the surface temperature difference between the external surface of

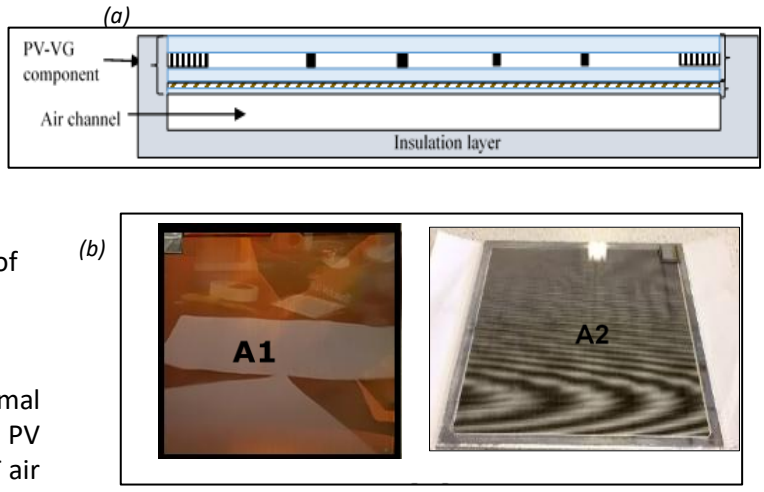


Figure 1:(a) The schematics of PV-VG/T-air (b) The PV-VG developed by researchers at Nottingham

the PV-VG (that is facing sunlight) with the internal surface (that is not facing the sunlight) is as high as 15˚C. Following these promising findings, a mathematical model has been developed for the PV-VG component when integrated with an insulated air channel to form a PV-VG/T solar air collector.

The simulation results, as shown in Figure 2, indicate that, for a single collector at 1.24m x 0.6m in size, at optimum air mass flow rate of 0.0221 kg/s, average solar radiation of 700 W/m^2, ambient temperature of 10˚C and air inlet temperature of 24˚C, the thermal efficiency achieved is as high as 70% with pre-heated air having a temperature as high as 40˚C. When arranged in series, 3 units of the collector is expected to produce preheated air at 62.5˚C.. The slim design of PV-VG/T air is comparable to the unglazed single pass PV/T air solar collector. When their performance was compared, the thermal efficiency of our PV-VG/T air is expected to be almost 40% higher in efficiency.

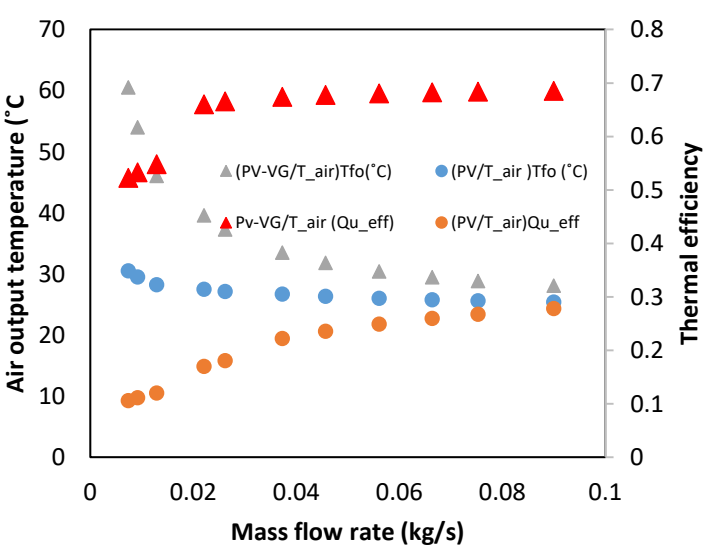


Figure 2: The simulation results for PV-VG/T- air

References:

H Jarimi, Q Lv, R Omar, S Zhang, S Riffat (2020)
Design, mathematical modelling and experimental investigation of vacuum insulated semi-transparent thin-film photovoltaic (PV) glazing
Journal of Building Engineering, 101430

Volume 13, Issue 1, January 2021

Utilization of controllable two-phase loop thermosyphon in a cool-storage refrigerator

Jingyu Cao, Weixin Liu, Gang Pei*

Department of Thermal Science and Energy Engineering, University of Science and Technology of China, 96 Jinzhai Road, Hefei, China *peigang@ustc.edu.cn

Refrigerator is widely used in the field of domestic appliances and has become a major consumer of household electricity in recent years; thus, efficiency improvement of refrigerators is of great importance to global energy-saving. For this purpose, the energy-saving performance of refrigerators has been improved by different methods, such as the modification of compressor/insulation, the optimization of the control strategy of the system, etc. Among these attempts, cool storage has been considering an efficient and cost-effective means to enhance the behaviour of a refrigerator. However, its drawback in temperature control of the refrigerator compartment has not received enough attention. In our latest research progress, a novel cool-storage refrigerator with a controllable two-phase loop thermosyphon was built (depicted in Figure 1), and the latter was innovatively used as a key precise temperature control device. Accordingly, the temperature control performance and the on-off control behaviors of the proposed system was focused. Long-term experimental studies were conducted to verify the feasibility of this innovative system.

The novel refrigerator was built with following structural characteristics: the PCM is stored in a stainless box located in the freezer to store cold energy; the condenser of the controllable two-phase loop thermosyphon is placed in the stainless box for heat transfer between PCM and working fluid of the controllable two-phase loop thermosyphon; the original evaporator of the Media BCD-111 refrigerator is used as the evaporator of the controllable two-phase loop thermosyphon; and the start-stop behaviors of the controllable two-phase loop thermosyphon are regulated by magnetic valves with the assistance of a temperature controller.

The adjustment capacity of the temperature control accuracy of the controllable two-phase loop thermosyphon is the focus of this work. As shown in Figure 2, the behaviours of the fresh food compartment at different T_{diff} (refers to the difference between the upper and lower temperature limits of the temperature controller) are selected for comprehensive discussion.

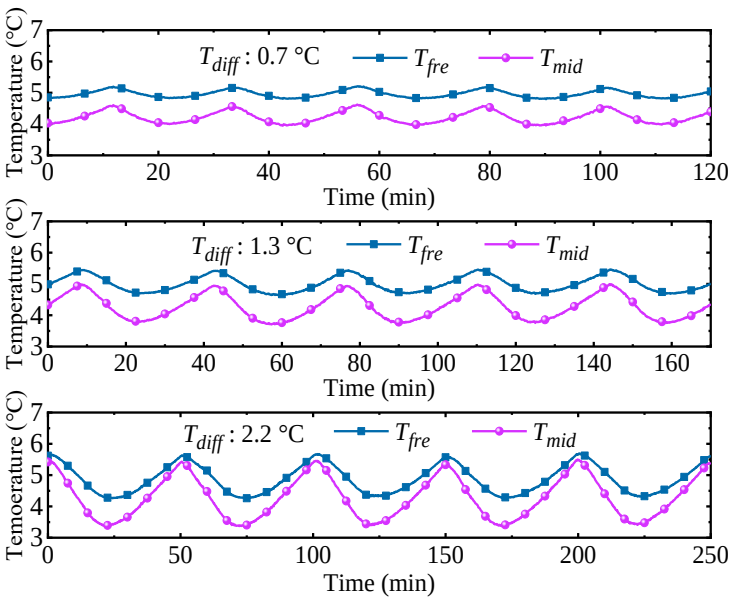
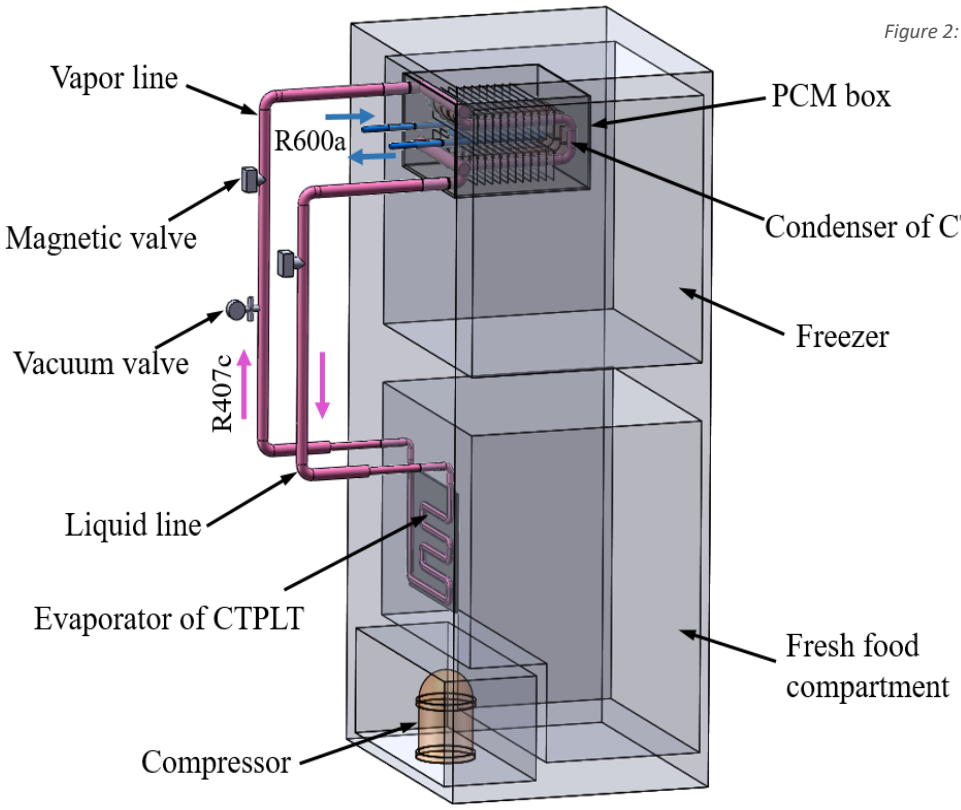


Figure 2: Temperature fluctuation behaviours



The variation amplitude of the representative temperature (T_{mid}) demonstrates the temperature control accuracy of the controllable two-phase loop thermosyphon well. When T_{diff} is 0.7 °C, a stable temperature control accuracy of 0.6 °C can be achieved, which is much higher than conventional domestic refrigerators (normally larger than 3 °C).

Volume 13, Issue 1, January 2021

Freshwater absorption type HDH system completely driven by solar energy: an industry demonstration

Hongfei Zheng, Xinglong Ma, Hui Kong

School of Mechanical engineering, Beijing Institute of Technology, Beijing 100081, China

An industry demonstration solar desalination system based on air humidification and dehumidification processes has been constructed in a coastal city in China. Its operation processes are shown in Figure 1. The system consists of a humidification and dehumidification (HDH) desalination device, a whole glass vacuum tubular solar collection system, a PV power generation system and a heat storage tank. The demonstration HDH system can be seen in the photo in Figure 2. The solar collection system provides heat energy for the HDH seawater desalination device and the PV power generation system provides electricity for the fans and pumps. The desalination system is composed of two independent humidification and dehumidification units in series. The design size of a single unit is 1.2m*1.2m*1.6m and the total area of the solar collector is 120m^2. The daylighting area of the PV power generation system is 9m^2 and the storage power of the battery is 5 kWh.

The humidifying filler in the humidifier/dehumidifier is polypropylene (PP), and the effective heat exchange area is about 100m^2. During the operation of the desalination system, the direction of air flow is opposite to that of spray water flow, which forms a counter

Figure 2. The demonstration HDH system

current heat transfer and an effective humidification/dehumidification process. In addition, in the aspect of heat recovery, the feed seawater is used to pass through the low temperature stage and the high temperature stage step by step to realise the efficient heat recovery process.

Preliminary experiments show that the desalination device can operate stably in the range of 1.6t/h ~ 3.0t/h of cold and hot water flow. When the seawater temperature is above 70°C, the water production rate of the system is about 100kg/h and the GOR is about 2.0. When the spray seawater temperature is above 80°C, the water production rate of the system is about 150kg/h and the GOR is about 2.3. In fine weather, the solar desalination system can produce about 1500kg of fresh water a day. The system has the remarkable advantages of having all non-metal manufacturing (then metal heat exchanger is arranged outside the device), no strict seawater pretreatment requirement and fully automatic operation, and has broad market prospects.

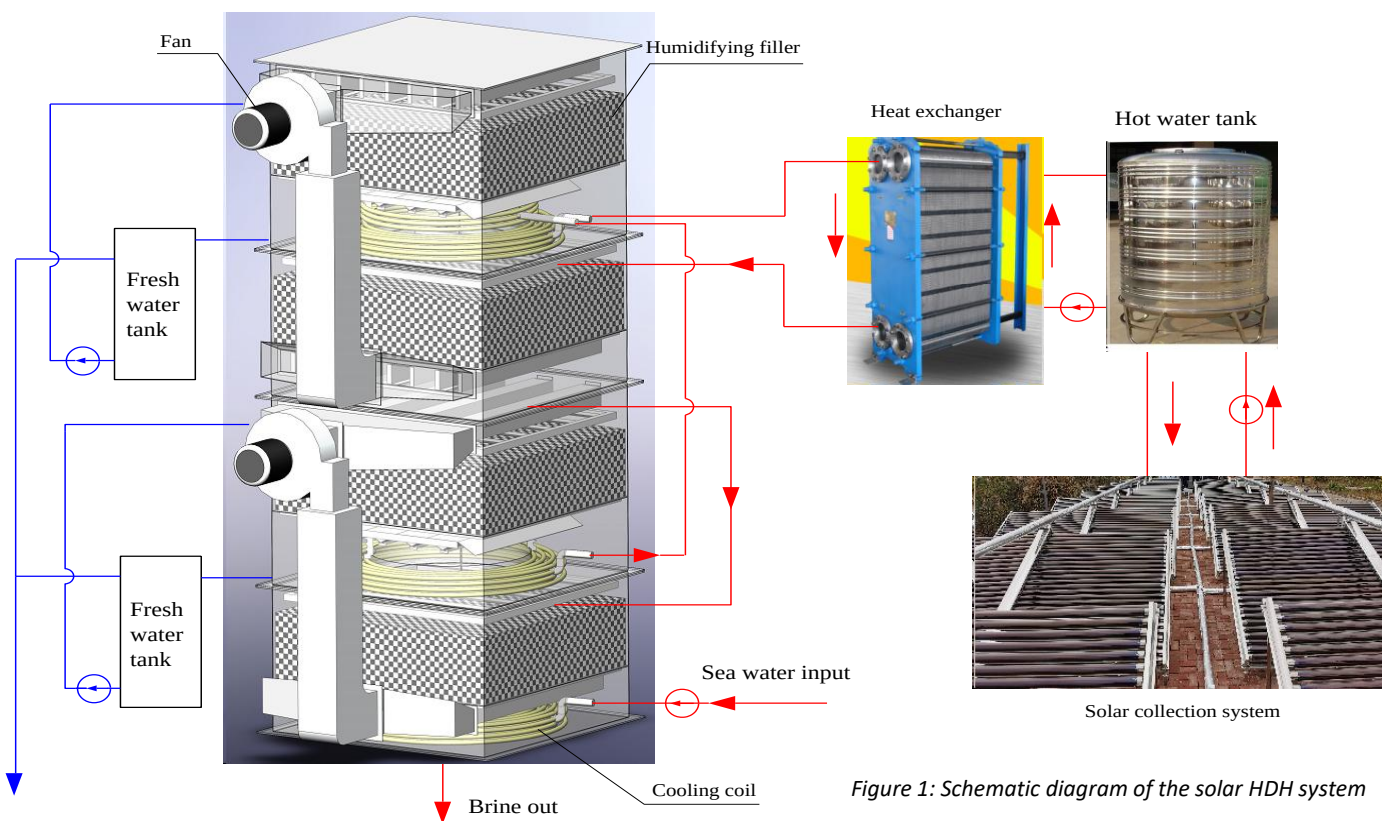


Figure 1: Schematic diagram of the solar HDH system

Volume 13, Issue 1, January 2021

A novel integration of radiative cooling into photovoltaic/thermal panel in buildings by applying a spectrally selective micro/nano coating

Mingke Hu, Yuehong Su, Saffa Riffat

Department of Architecture and Built Environment, Faculty of Engineering, University of Nottingham, University Park, NG7 2RD, Nottingham, UK

Lighting, heating, and cooling are essential for modern buildings, which incur a huge energy demand. In economies such as the EU, US, and China, buildings consume around 40% of the total energy supply. To tackle this challenge, governments have endeavoured to implement effective policies and technologies for developing Zero Energy Buildings (ZEB), hence there is an urgency to develop effective technology to provide part of the energy consumed in buildings by green, renewable alternatives such as solar energy and radiative cooling.

Solar photovoltaic (PV) cells can only convert part of solar radiation into electricity. Roughly 85% of solar energy is dissipated into heat by photothermal (PT) conversion, which in turn, aggravates PV efficiency. Accumulated heat in PV panels is inevitably produced but can be partly removed by cold fluid, which leads to the well-known PV/T technology. However, a PV/T collector is generally idle at night, so it would be beneficial to extend its function for nocturnal operation. By contrast, night sky cooling can exactly fit this purpose in a passive radiative cooling (RC) manner. RC collectors mainly exploit the "atmospheric window" (8–13 μm) to dump heat into the cold universe. Typical RC collectors are more likely to effectively run at night with the absence of sunlight, thereby exactly mismatching the

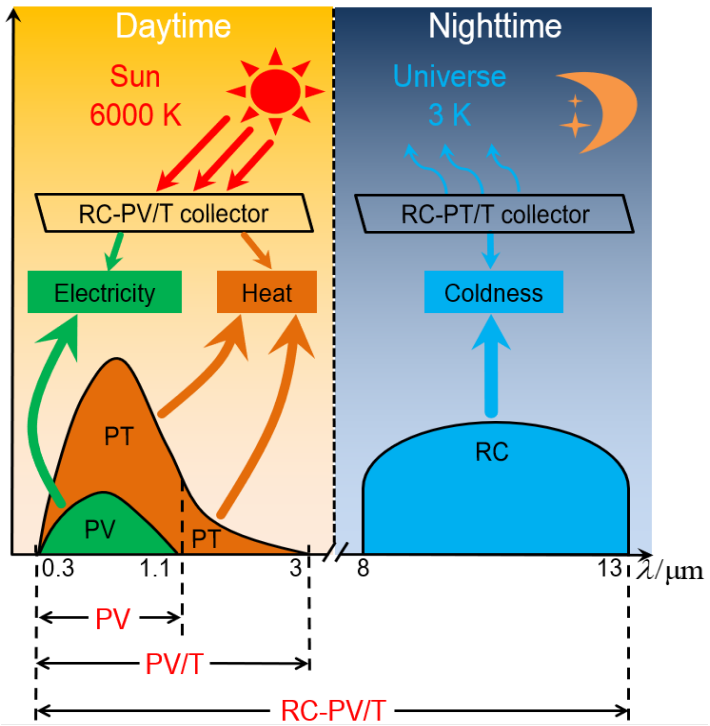


Figure 1. Schematic of the comprehensive utilization of solar photovoltaic conversion, photothermal conversion, and radiative cooling (RC-PV/T). The spectral response range of common crystalline silicon solar cells (0.3–1.1 μm) is exemplified.

operation time of PV/T collectors. Considering the complementarity between the two collectors in terms of operating periods and types of energy outputs, associated with their similarities in configuration and eco-friendliness, it is of significance and possibility to integrate them into one single collector. Such a hybrid collector, named as a radiative cooling-photo-voltaic/thermal (RC-PV/T) collector, is proposed in this project. By uniquely incorporating the three physical processes (i.e., PV, PT, and RC) in different bands, the RC-PV/T collector can generate electricity and heat during the daytime and harvest cooling energy at night (see Figure 1). The RC-PV/T collector essentially includes a cover, an RC-PV/T panel, an air gap, an air channel, copper pipes, and insulation materials (see Figure 2).

Cont.

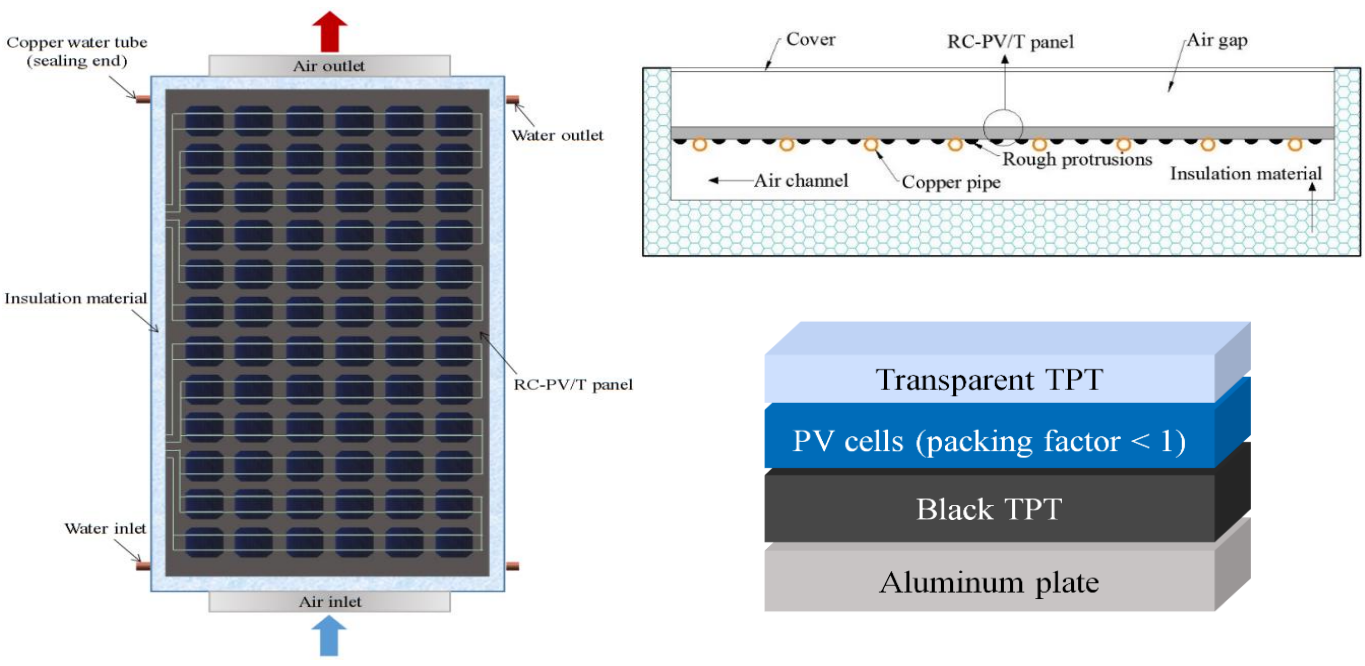


Figure 2. Schematic of the RC-PV/T collector. Left: Front view; Upper right: Cross-section view; Bottom right: the RC-PV/T panel.

Cont. The collector is designed to operate in either water heating/cooling or air heating/cooling modes. It can be coupled with an inherent HVAC system in buildings (see Figure 3). The BiRC-PV/T system works principally in three modes: (a) daytime PV and water heating mode, generally in Spring and Autumn, (b) daytime PV and air heating mode, mainly in Winter, (c) nighttime air cooling mode, in the Summer.

This project provides an eco-friendly solution for building energy saving by incorporating solar photovoltaic and photothermal conversions, and radiative cooling into one single collector. When comparing the PV panel, or solar thermal collector, or radiative sky cooler, this new collector shows advantages in multifunction, all-day operation, overall efficiency, initial cost, and payback period, etc. By integrating the RC-PV/T collector to the limited building roof properly, it can supply electricity and hot water throughout the year for lighting, bathing, etc., deliver heat for space heating in winter, and supply cooling energy for room cooling in summer, thus accommodating the seasonal energy consuming characteristics of buildings. Preliminary results indicate that over 90% of the daily energy consumption in a 200 m^2 house in Eastern China can be covered by renewable energy if the roof is entirely covered with RC-PV/T collectors, with an annual cost saving of over £500 and carbon emission reductions of over 2 tons.

This project is funded by the H2020 Marie Skłodowska-Curie Actions and hosted by the University of Nottingham. The successful completion of this innovative project will involve expertise in solar energy conversion, radiative cooling, micro/nano coating, low carbon buildings, heat transfer, fluid dynamics, etc. This brings out a new opportunity for interdisciplinary research among solar energy conversion, material science, and thermal engineering. The project team is looking for collaboration with researchers particularly experienced in micro/nano material science.

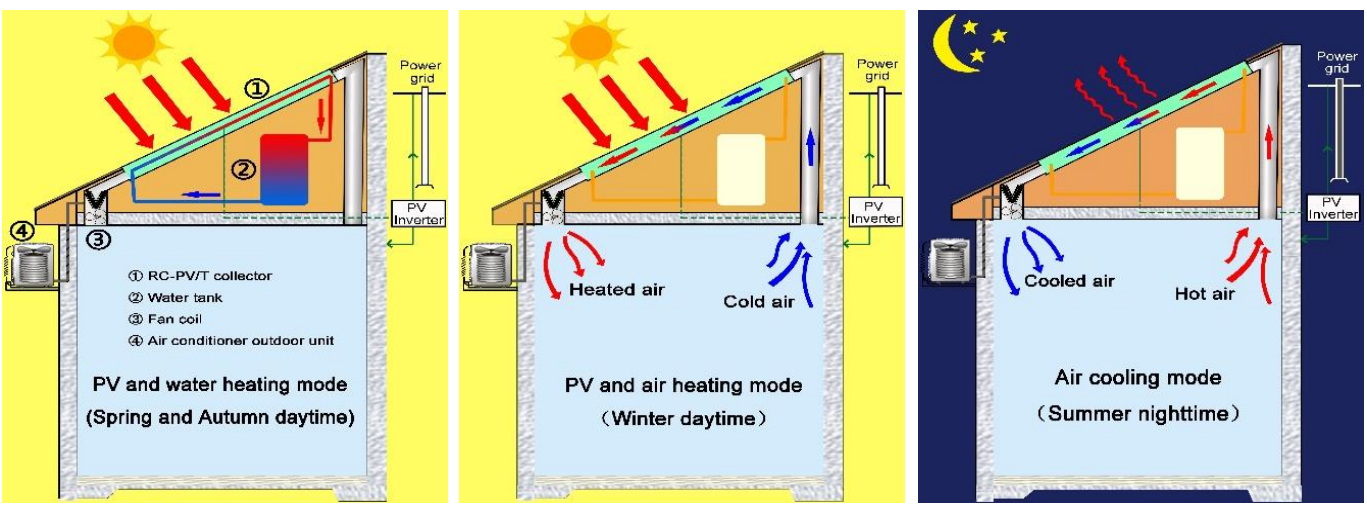


Figure 3. Working principles of the BiRC-PV/T system.

Development of concentrated solar thermal technology integrated with vanadium dioxide-based thermochromic coating

Qiliang Wang and Hongxing Yang

Renewable Energy Research Group (RERG), Department of Building Services Engineering, The Hong Kong Polytechnic University, Hong Kong, China

As an entirely renewable energy technology without environmental pollutions incurred, concentrated solar thermal collectors are appealing and promising approaches to harvest high-temperature heat from solar energy for power generation. Parabolic trough collector (PTC) is the most mature concentrated solar thermal collector technology with popularly wide applications in concentrated solar power (CSP) plants.

At high operating temperatures, it is crucial for parabolic trough receivers (PTRs), the key components of PTC systems, to achieve efficient solar-thermal conversion performance like that at lower operating temperatures. Inevitably, however, the radiant heat loss from the PTRs increases rapidly with the operating temperature, varying as its fourth power, which seriously lowers the solar-thermal conversion efficiency of the PTC system and techno-economic performance of CSP plants at higher operating temperatures.

To effectively reduce the massive radiant heat loss of PTRs and improve the solar-thermal conversion efficiency of the PTC systems at high operating temperatures, lots of productive researches have been carried out in recent years, such as the improvement of optical properties of the solar selective-absorbing coating. However, limited effects on improvement of the solar-thermal conversion efficiency of the PTC systems are achieved in recent years due to progress on advanced materials. *Cont.*

Cont. To date, many researchers have proposed optimization strategies of partially structural changes in the PTRs. For instance, Wang et al. proposed a radiation shield to the upper part of the vacuum annular inside PTR (nonconcentration part) for reducing the radiation heat loss from the absorber tube. Though the noncencentrated incident solar radiation will be blocked by the radiation shield, the reduced heat loss by the radiation shield is much larger than the blocked solar radiation. Therefore, the radiation shield could effectively improve the solar-thermal efficiency of the PTC system.

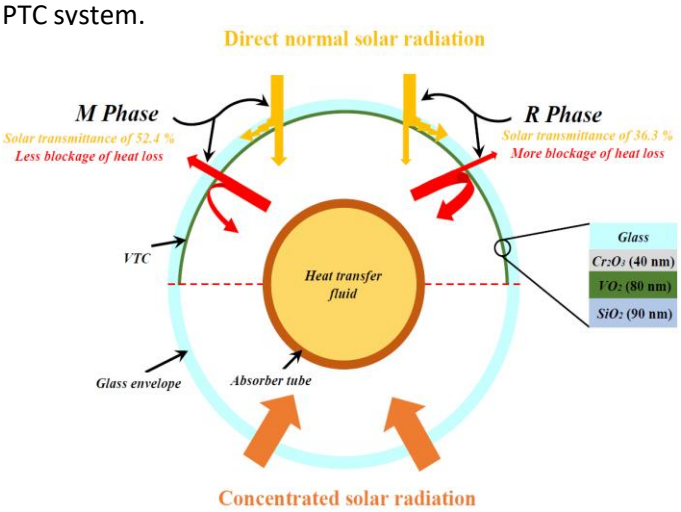


Figure 1: diagram of the proposed PTRs with a vanadium dioxide-based thermochromic coating (VTC)

In the framework of previously proposed PTRs which are partially optimized, a new PTR integrated with a vanadium dioxide (VO_2) thermochromic coating is first proposed to further enhance the overall performance in low and high operating temperatures (Figure 1). VO_2 coating is a popular thermochromic coating and has been attracting much scientific interest due to its unique phase transition feature, i.e. a reversible transition with different spectrum-selectivity characteristics from the monoclinic (M) phase to the rutile (R) phase at critical temperature (T_c) of 68°C. In the phase transition process, the spectrum-selectivity characteristics of the VO_2 coating have marked modulations in the solar transmittance (higher value in M phase but lower value in R Phase) and near-infrared reflectance (lower value in M phase but pretty high value in R Phase), as shown in Figure 2.

For a long time, various VO_2 coatings were proposed and widely studied for smart windows to realize the self-adjusting of incident solar radiation, but the critical temperature of 68°C is too high to achieve satisfactory regulation performance for smart windows.

The temperature of the glass envelope in the PTR could rise from 20 to 100°C along with the increase of operating temperature from 100 to 500°C would be a pretty appropriate temperature for C so that the critical temperature of 68°C in the VO_2 coating the effective integration of the VO_2 layer and PTR. Unlike the applications of VO_2 coating in smart windows with the service temperatures below 100 °C, the VO_2 coating used in the PTR deals with high levels of radiation, and its operating temperature could reach values above 100°C. Thus, a novel vanadium dioxide-based thermochromic coating (VTC) with more excellent environmental stability and long life is adopted in this project. The VTC is deposited on the inner surface of the glass envelope in NTR.

The results show that no matter under the M phase or R phase, the thermochromic coating can play unique advantages to improve the thermal performance of the proposed solar receivers. The heat loss and thermal efficiency of the proposed solar receivers are effectively reduced and enhanced by 18.2% and 4.8% at the absorber temperature of 600°C and inlet fluid temperature of 580 °C, respectively.

References

1. Qiliang Wang, Boxu Shen, Junchao Huang, Honglun Yang, Gang Pei, Hongxing Yang. A spectral self-regulating parabolic trough solar receiver integrated with vanadium dioxide-based thermochromic coating. *Applied Energy*, 2021, accepted.

2. Qiliang Wang, Honglun Yang, Mingke Hu, Jingyu Cao, Gang Pei, Hongxing Yang. Optimization strategies and verifications of negative thermal-flux region occurring in parabolic trough solar receiver. *Journal of Cleaner Production*, 2020, 278: 123407. https://doi.org/10.1016/j.jclepro.2020.123407

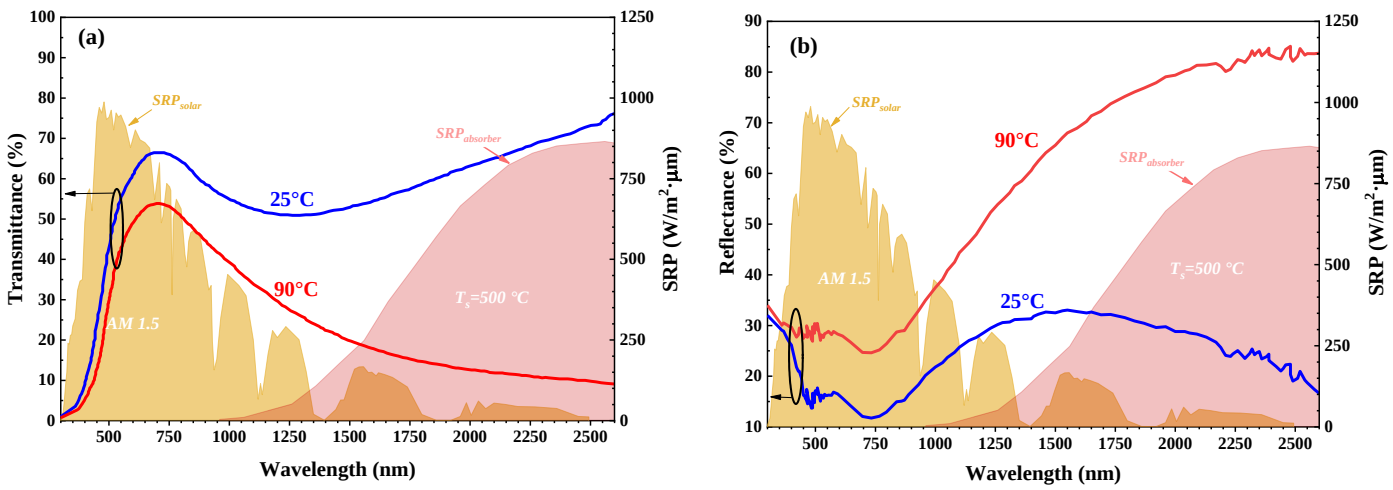


Figure 2: Spectrum-selectivity curves of the glass integrated with VTC at 25 °C and 90 °C: (a) spectral transmittance, (b) spectral reflectance

Volume 13, Issue 1, January 2021

WSSET News and Information

Submission deadlines for all WSSET awards: 31st March 2021

There is still time to apply for one of the new WSSET awards, most with cash prizes, open for young members - PhD students and new researchers. For more information on each award and restrictions on entrants, visit the WSSET Awards page at https://www.wsset.org/news-events/awards

- **President's Prize:** with a cash prize of £1,000 for a research project or idea related to helping the fight against COVID-19., eg minimising the impact in hospitals, healthcare centres and buildings;
- **WSSET PCM Products Award – Best PhD Student Project in Energy Storage:** with prize money of £500, this award recognises the research innovation in thermal energy storage systems;
- **Terry Payne Award – Young Researchers /PhD Students in Developing Countries:** the Award recognises the research innovation that our members in these countries are carrying out with a £500 cash award;
- **Terry Payne Award – Best Research by Female Scientist in Developing Countries:** to acknowledge the extraordinary work that our female members are carrying out, there is a £750 cash award;
- **Future Cities and Environment – Open Competition for PhD Review Papers:** The FCE journal is offering publication for two Review Papers with the Article Processing Charge (APC) being 100% waived.

5th WSSET Innovation Awards 2021. Deadline for submissions: 31st March 2021

The WSSET Innovation Awards recognise the achievements of private individuals and organisations in new sustainable technologies and encourage the wider application of these new developments. Innovative ideas are welcome in any of the following areas:

- Renewable energy systems
- Power generation technologies
- Energy efficiency
- Low carbon buildings and future cities
- Water treatment and desalination
- Sustainable materials
- Waste management and water recycling
- Agri-food technologies

To enter, go to www.wsset.org/news-events/innovation-awards and download an application form. Winners will be announced at the SET2021 gala dinner in August.

RUSHLIGHT SHOW – virtual, 10th -11th March 2021

The 12th Rushlight Show, kindly headline sponsored by Innovate UK, is taking place on Wednesday and Thursday 10-11 March 2021 as a virtual event with all the interactions of a physical event. With an expected audience of over 500, it is the leading event for cleantech companies and sustainable solutions to meet investors and financiers, corporate customers, government departments, advisers and intermediaries

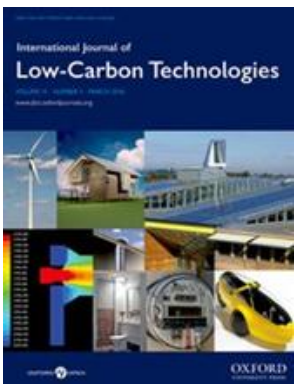
Full event details are available at www.rushlightevents.com/rushlight-show.
With delegate places for the whole Show starting at £50/ £100 plus VAT, this event is designed to be both informative and exceptional value for money.

Companies interested in presenting in the Innovation Showcase of the Cleantech Conference, to the Sustainable Solutions Market Panel or in the private Investor Lounge pitching session merely have to register as a delegate(s) and then apply for one of the remaining slots.

The event highlights are:

- The Innovation Showcase of the Cleantech Conference;
- The Sustainable Solutions Market Panel;
- The Exhibition, incorporating the Innovate UK and other Showcases;
- UK Energy session, which will set out the pathway to Net Zero 2050;
- The Natural Capital & Resourceful session;
- Private Investor Lounge for live investor pitches;
- Networking with open and private bubbles, one-to-one, exhibitor interaction and business card introduction, all on video chat, live chat and scheduled meetings.

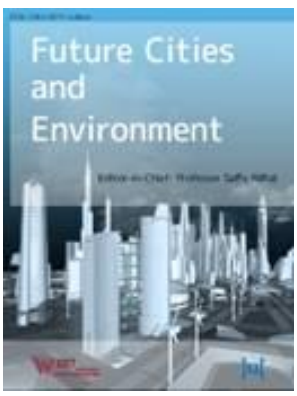
Volume 13, Issue 1, January 2021



WSSET exclusive offer – IJLCT

The International Journal of Low-Carbon Technologies (IJLCT), whose Impact Factor has increased to 1.054 with indexing in the WOS and the JCR, offers a 20% discount to the APC (article processing charge) for WSSET members wishing to publish a paper in IJLCT (open access). This will cost WSSET members £915 (€1099) as opposed to the full charge of £1144 (€1373). Authors will need to state that they are WSSET members when paying.

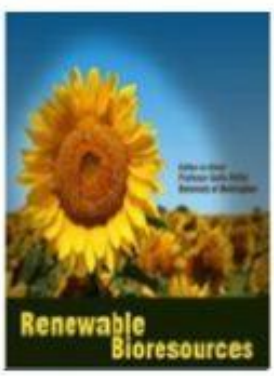
Please visit www.ijlct.oxfordjournals.org to submit your articles.



WSSET exclusive offer - FCaE

Also in conjunction with Future Cities and Environment (FCaE), WSSET have agreed a £25 discount to the APC (article processing charge) for WSSET members wishing to publish a paper in FCaE (open access). This will cost WSSET members £475 compared to the full charge of £500. Authors will need declare their membership details to the editorial team when it comes to payment before publication.

Please visit www.futurecitiesandenvironment.com to submit your articles.



Renewable Bioresources is an Open Access (Gold OA), peer reviewed, international online publishing journal, which aims to publish premier papers on all the related areas of advanced research carried in its field. Renewable Bioresources emphasizes the advanced applications of biotechnology to improve biological ecosystems through renewable energy derived from biological sources.

Please visit www.hoajonline.com/renewablebioresources to submit your articles.

Volume 13, Issue 1, January 2021

If you have recently moved, changed jobs, or changed email address, please remember to update your membership details or contact secretary@wsset.org with your new details.
If you no longer wish to be a member of WSSET or you want to unsubscribe from emails, please unsubscribe here.

Thanks

Donations are welcome 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

Important for the repudiation of WSSET

Neither the WSSET, nor any person acting on its behalf:

(1) assumes any responsibility with respect to the use of information of, or damages resulting on the information on this WSSET-Newsletter;

(2) gives any warranty or representation, express or implied, with respect to the accuracy of the information, opinion or statement contained here.

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 nearly 2000 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 secretary@wsset.org

Furthermore please contact secretary@wsset.org regarding any conferences, seminars or symposiums relating to topics of sustainable energy technologies that you wish to be advertised in the newsletter.

Once again, thank you for your continued support to WSSET.