

# School of Energy and Environment E-NEWSLETTER

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From left to right: Mr. Raymond CHENG Siu-hong (Group General Manager & Chief Operating Officer, Asia Pacific, The Hongkong and Shanghai Banking Corporation Limited) and Miss Violet LAW Tsz-kwan (Awardee of 2016)

*Please refer to P.5*



CityU's project on turning food waste into PLA textile fibre won the Gold Medal with the Jury's commendation in the 44<sup>th</sup> Geneva International Exhibition of Inventions.

*Please refer to P.7*

## DEAN'S MESSAGE

Dear Readers,

Here is the latest issue of the e-Newsletter of the School of Energy and Environment, City University of Hong Kong.

With the e-Newsletter, we bring you an update of the recent development of our School in various aspects including new faculty members, encouraging achievements of our faculty and students, and so on.

Thank you very much for your continued support and advice which are essential to our success now and in future. If you have any suggestions, please let us know.

Enjoy reading!

Best,  
Chak  
Professor Chak K. Chan  
Dean of School of Energy and Environment  
City University of Hong Kong



## NEW FACULTY

SEE has appointed new faculty members across the spectrum that can enhance our research capabilities and provide students with education in fresh perspectives in energy and environment.

**Dr. Sam Hsien-Yi HSU, Assistant Professor**



Greetings and Happy New Semester! My name is Sam H. Y. Hsu and I will join SEE in fall semester of 2016. I was born and raised in Taiwan (R.O.C.) where I received Bachelor's and Master's degrees at National Chung Hsing University and Nation Taiwan University, respectively. I obtained PhD degree at University of Florida with focusing on photophysical behaviors of metallopolymer materials for solar energy applications. Then I got the two-year postdoctoral appointment from Prof. Allen Bard in Center for Electrochemistry at University of Texas at Austin.

My research interests involve the material, imaging, spectroscopy and solar energy applications and I have the desire in the investigation of charge transfer processes and photoredox reactions by utilizing scanning photoelectrochemical microscopy and ultrafast laser spectroscopy for photovoltaics and solar fuel devices. I look forward to collaborating with other outstanding colleagues in CityU and discussing with you with marvelous research ideas.

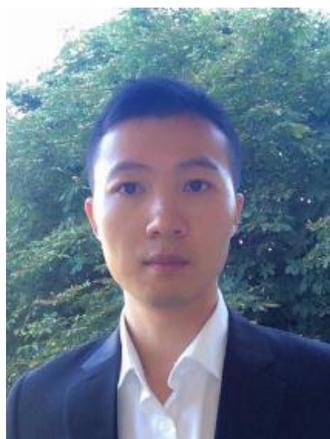
### Dr. Jin SHANG, Assistant Professor



Hello everybody! My name is Jin Shang and I have recently joined SEE as an Assistant Professor. I was born and raised in China, where I obtained my Bachelor and Master degrees both in Environmental Engineering at Northeastern University. Then I went to Australia and got my PhD in Chemical Engineering at the University of Melbourne, studying gas adsorption and separation using porous materials. After working as postdoctoral research fellow for 3.5 years at the University of Melbourne and Georgia Institute of Technology focusing on developing advanced adsorbents for carbon capture, I joined CityU to start the new chapter of my research career with great honor and humble appreciation.

My research interests are in adsorption and separation technologies applied in energy production/storage and environmental protection fields, including energy gas (e.g., hydrogen and methane) purification and storage and air pollution control (e.g., sulfide, nitride, and volatile organic compounds removal). I conduct combined experimental and molecular simulation work to study and design porous materials as adsorbents for targeted applications. I am looking forward to working together with my talented fellow colleagues to meet the future challenges in such a unique and exciting interdisciplinary school.

### Dr. Lin ZHANG, Assistant Professor

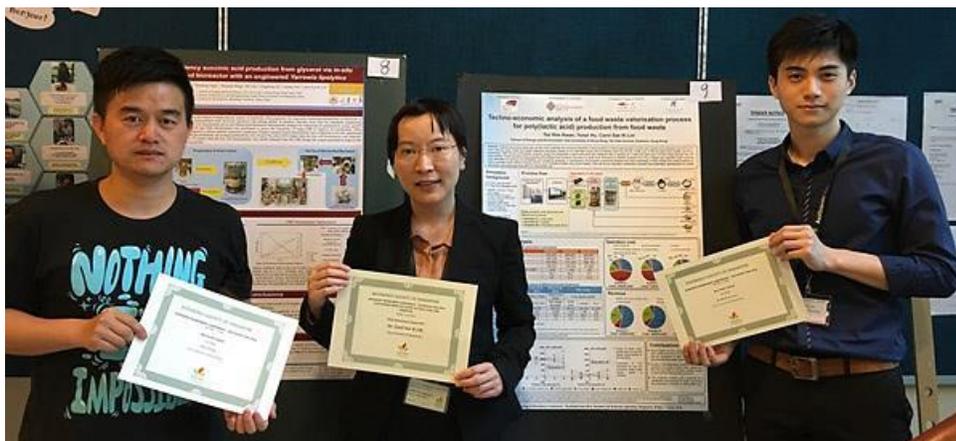


Hello everyone, my name is Lin Zhang. I will be an Assistant Professor at SEE this fall. I read mechanical engineering and economics from Peking University, and earned MSc in management and economics, PhD in economics from ETH Zurich. I have been a postdoctoral researcher in the Center of Economic Research at ETH Zurich, a researcher associated with the Energy Science Center, Simulation Lab, and the Competence Center for Research in Energy, Society, and Transition in Switzerland. My research focuses on a wide range of topics in the field of energy policy and economics. I am interested in developing improved quantitative modeling approaches for the design, evaluation, and upgrade of sustainable energy policies at local, regional, and global levels. I look forward to joining SEE and meeting all of you in the near future.

## FACULTY AND STUDENT ACHIEVEMENTS

### Dr Carol Lin's research team achieved spectacular results in the BioEnergy and Biorefinery Conference – Southeast Asia 2016

The research team led by Dr. Carol Lin Sze-ki (Assistant Professor in SEE) attended the BioEnergy and Biorefinery Conference organized by the BioEnergy Society of Singapore (BESS) held in National University of Singapore on 30 May – 1 June 2016. With their outstanding research efforts, they won three awards, namely the BESS Achievement Award, the 2<sup>nd</sup> and 3<sup>rd</sup> prize of Poster Awards.

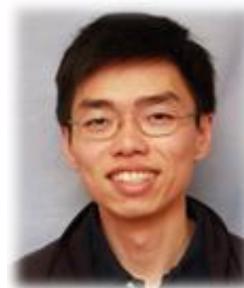


Dr. Carol Lin was awarded the BESS Achievement Award 2016 for her research in converting expired food and beverage waste to fructose. Her PhD students Mr. Chong Li and Mr. Tsz Him Kwan received the 3<sup>rd</sup> and 2<sup>nd</sup> in poster awards for their posters titled 'High efficiency succinic acid production from glycerol via *in-situ* fibrous bed bioreactor with an engineered *Yarrowia lipolytica*' and 'Techno-economic analysis of a food waste valorisation process for poly(lactic acid) production from food waste'.

### Congratulations to Dr. Patrick LEE and Dr. Zhi NING for winning The President's Awards!

To recognize the faculty members for their accomplishments in research and professional education that has enabled the University to make remarkable strides in the local and global recognition, The President's Awards are given to the awardees after a vigorous nomination and selection exercise. The list of awardees of The President's Awards was announced in mid-January 2016 and Dr. Patrick Lee and Dr. Zhi Ning, both Assistant Professors of the School of Energy and Environment, were listed among the 30 awardees, many of whom are Chair Professors/Professors in the University.

Dr. Patrick Lee's research revolves around the theme of microbiology with emphasis on the physiology, genome and ecology of microorganisms. With devoted efforts, research results from his group have gained a fundamental understanding on microorganisms so that the knowledge can be applied to solve energy, environmental and human health problems. For experimental and computational investigations, Dr. Lee's group uses advanced high-throughput systems and biology methods such as next-generation sequencing to facilitate discovery and his group also strives to translate the fundamental knowledge into practical solutions for various sectors and industries.



Dr. Zhi Ning's research focuses on the urban air quality issues related to public health and built environment. In the past few years, he and his research team have invented and developed multiple new technologies to tackle air pollution with international awards, and received strong local and international recognition. He also led his team in research on fundamental sciences of air pollution to provide the interface with important environmental policy formulation and contributed to the initiatives for sustainable environment development. Let's whole-heartily congratulate Dr. Lee and Dr. Ning for their well-deserved honour again !

## Innovation and Technology Scholarship Award Scheme 2015 received by SEE undergraduate student

### Congratulations to Miss Violet LAW Tsz-kwan!

The School of Energy and Environment is delighted to announce that our second-year undergraduate student, Miss Violet LAW Tsz-kwan, outcompeting the other candidates from the six local universities in Hong Kong, has been selected as one of the 25 awardees of an eminent scholarship award – **Innovation and Technology Scholarship Award Scheme 2016**.

The Scholarship Award Scheme, organized by the Hong Kong Federation of Youth Groups and sponsored by the Innovation and Technology Commission and The Hongkong and Shanghai Banking Corporation Limited, aims to broaden industrial and international perspectives of the young people who have passion in science and technology and enthusiastic desire to pursue a career in the disciplines as well as nurturing talents for the innovation and technology industry. Being one of the awardees, Violet will be granted a scholarship of up to HK\$150,000 for a series of elite training programmes including Overseas Attachment Programme, Mentorship Programme, Service Project Programme and/or Local Internship Programme (optional).

This is the 3<sup>rd</sup> consecutive year that the prestigious scholarship has been awarded to the undergraduate students of our School of Energy and Environment. We believe such recognition will further encourage our students to develop their potential and continue to shine in various aspects.

Please join us in congratulating Violet for receiving the prestigious award!



From left to right: Mrs. Roslyn LI (Associate Director of Student Development Services), Professor Chak K. CHAN (Dean of SEE), Miss Violet LAW Tsz-kwan (Awardee of 2016), Miss Zoe LEE Hei-yan (Awardee of 2014), Mr. Sunny LEE Wai-kwong (Vice-President (Administration)) and Professor Jian LU (Vice-President (Research and Technology)) at the award presentation ceremony on 21 April 2016

SEE undergraduate students awarded the Third Prize in "Challenge Cup" National Competition – Hong Kong Regional Final, Hong Kong University Student Innovation and Entrepreneurship Competition 2016

Miss Catherine LAM Suet-yan, Mr. Falcon LEUNG King-wai, Miss Yvonne YAN Yeung-fong and Miss Ann YU Yan-ki, third-year SEE undergraduate students majoring in Energy Science and Engineering, won the Third Prize [三等獎] under the discipline of “Energy and Chemical Engineering” in the “Challenge Cup” National Competition – Hong Kong Regional Final, Hong Kong University Student Innovation and Entrepreneurship Competition 2016 (“the Competition”) [香港大學生創新及創業大賽 2016 挑戰盃全國賽香港區選拔賽] on 22 June 2016 (Wednesday). It is our great pleasure that

SEE undergraduate students have been consecutively awarded in two years. Hurray !



From left to right: Mr. Falcon LEUNG King-wai, Miss Ann YU Yan-ki, Miss Yvonne YAN Yeung-fong and Miss Catherine LAM Suet-yan at the awards ceremony

The Competition, first in 2015, was organized by the Hong Kong New Generation Cultural Association (HKNGCA). Unlike before, the foci of innovation and entrepreneurship were put together in one competition this year, aiming at providing students with opportunities to explore in academia and developing social enterprise by enhancing their innovative design and research skills as well as entrepreneurial skills to broaden their horizons. For more information of the Competition, please visit [www.hkchallengecup.com/](http://www.hkchallengecup.com/).

As a team of four, the students worked on the project “A Review on Implication of Green Technologies on Hong Kong Seawater Desalination Plant”, investigating the applicable renewable energy resources on the proposed Hong Kong Seawater Desalination Plant and studying the emerging research development of energy recovery technologies on reverse osmosis process. Students have applied their theoretical knowledge and engineering perspective in overcoming the hurdles, gaining innovative and research experience, and improving their communication and design skills.



Group photo at the award ceremony on 22 June 2016

## RESEARCH

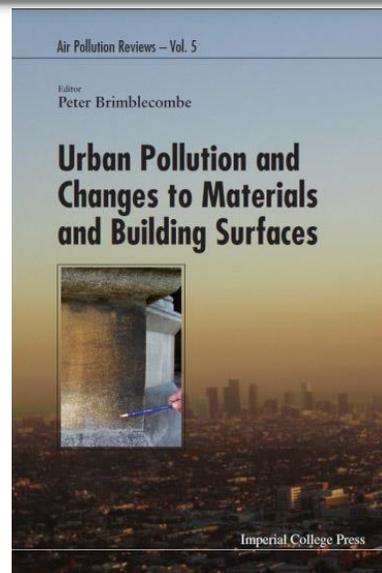
### Two new books on urban pollution published by Prof. Peter Brimblecombe

#### *Urban Pollution and Changes to Materials and Building Surfaces*

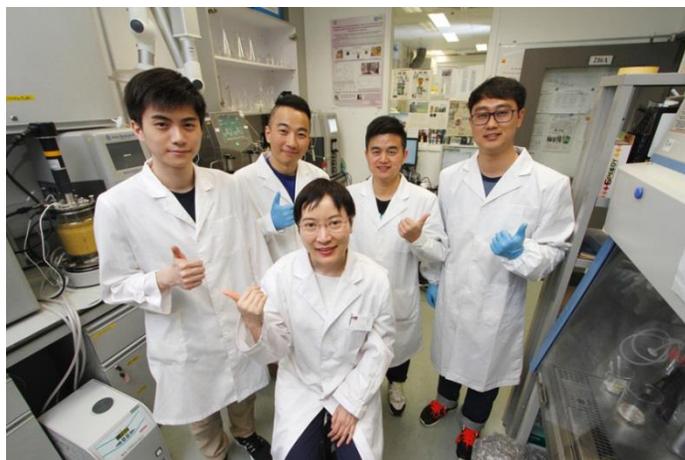
Pollution damages materials, but it has changed dramatically in the past century, with a reduction in the concentration of corrosive primary pollutants in urban atmospheres. At the same time, architectural styles and types of materials have changed, as we have moved to more organically rich, photochemically active atmospheres. Contemporary pollutants have a greater potential to degrade organic coatings and polymers, which are of great importance to modern structures.

*Urban Pollution and Changes to Materials and Building Surfaces* examines a range of materials, discussing the ways in which they are likely to be damaged by contemporary urban pollutants, with an emphasis on the effects of air pollution. A chapter on graffiti is also included.

The wide scope covered means that this volume is suitable for readers from a broad background. It should be of interest to scientists and policymakers dealing with the effects of urban pollution, as well as undergraduate and graduate students working in this area.



### From leftover food to fashion apparel



A novel biorefinery process developed by biochemical scientists at City University of Hong Kong (CityU) that turns food waste into textile fibre has won the Gold Medal with the jury's commendation in the 44th Geneva International Exhibition of Inventions this year.

This groundbreaking technology could be solution to managing the 3,600 tonnes of food waste produced in Hong Kong every day.

Dr. Carol Lin and her research team have successfully converted 100 grammes of food waste into 10 grammes of polylactic acid (PLA) fibre within a week. The new material can be used to manufacture textile and apparel products. The application of this commonly used bioplastics is not limited to textile and clothing. There is a wide array of PLA products ranging from blankets and utensils to tableware and plastic bags.

In addition to PLA, Dr Lin's research team has successfully exploited food waste to regenerate other chemicals and materials. For example, bakery waste can be used to produce succinic acid for manufacturing food packaging materials, paint and ingredients for medicine, among others.



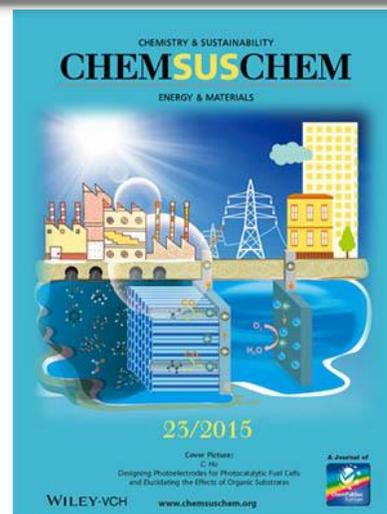
Food waste is treated using a series of fermentation and polymerization procedures to make PLA fibre.

Dr. Wey Yang TEOH's research works on PhotoFuelCell and advanced electrolyte material for fuel cells were featured on journal front covers

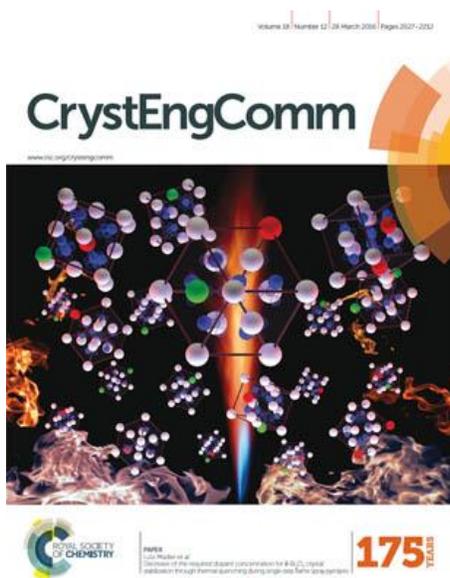
### Cover in ChemSusChem:

Ever wonder what you can do with the flushed wastewater other than channeling it to sewage treatment plant? Dr. Wey Yang TEOH and his team reported the direct generation of solar electricity from wastewater using a PhotoFuelCell constructed from specially designed nanostructured photoelectrodes.

Under solar irradiation, the nanostructured photoelectrode generates electron-hole pairs. Under normal circumstances, these charge carriers recombine within nanoseconds, and hence very little energy can be extracted. Here, Dr. Teoh and his team showed that the presence of organic wastes in the wastewater increases the efficiency of the electric production by almost 10 folds! In the process, the organics content was removed and hence the wastewater is being cleaned. The effort is being highlighted as the cover of ChemSusChem, and the leading author of the paper is Dr Chenyan Hu, a former PhD student of Dr. Teoh.



The team of Dr. Teoh is now collaborating with the Drainage Services Department to design an even higher efficiency device to harness electricity out of the different domestic wastewater sources in Hong Kong.



### Cover in CrystEngComm:

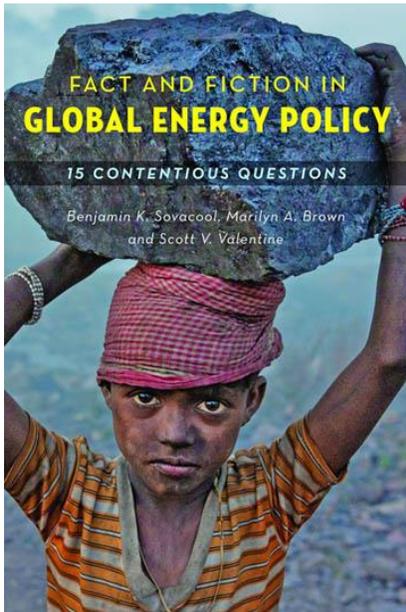
The teams of Dr. Teoh at City University of Hong Kong, Prof Atsushi Urakawa of ICIQ Spain, and Prof Lutz Maedler at the University of Bremen reported the synthesis of delta-Bi<sub>2</sub>O<sub>3</sub> with extremely low amount of dopants.

conductive.

Delta-Bi<sub>2</sub>O<sub>3</sub> is known to be one of the most efficient oxygen ion conductors around. It is a holy grail electrolyte material that potentially paves the way for the construction of highly-efficient low-temperature solid oxide fuel cells (SOFCs). The current SOFC technology requires operation at high temperatures at above 800 deg C, just so that sufficient oxygen ion conductivities can be achieved using the standard yttria-stabilized zirconia electrolyte. Unfortunately, the high temperature operation inevitably lowers the chemical-to-electricity conversion efficiencies in fuel cells. The replacement with delta-Bi<sub>2</sub>O<sub>3</sub> potentially reduces the SOFC operating temperature to below 300 deg C, provided that the metastable material is not overly doped that it becomes weakly

Here, the collaboration of Dr. Teoh, Urakawa and Maedler and their teams capitalised on the combined high temperature and rapid quenching processes in the flame spray pyrolysis to produce delta-Bi<sub>2</sub>O<sub>3</sub> nanoparticles with only 2.5% Mn and 2.5% Ti dopants. This is by far the lowest amount of dopants ever been reported. The work appeared as the Front Cover of CrystEngComm (RSC Publishing), and was selected as the Hot Article in 2016. The lead author of the paper is Dr Jochen A.H. Dreyer, the inaugural Hong Kong PhD Fellowship recipient of the School of Energy and Environment. Dr Dreyer is now pursuing his research career at the University of Cambridge.

A new book with great insights, *Fact and Fiction in Global Energy Policy: Fifteen Contentious Questions*, published by Dr. Scott Valentine



Energy sustainability and climate change are two of the greatest challenges facing humankind. Unraveling these complex and interconnected issues demands careful and objective assessment. *Fact and Fiction in Global Energy Policy* aims to change the prevailing discourse by examining fifteen core energy questions from a variety of perspectives, demonstrating how, for each of them, no clear-cut answer exists.

Is industry the chief energy villain? Can we sustainably feed and fuel the planet at the same time? Is nuclear energy worth the risk? Should geoengineering be outlawed? Touching on pollution, climate mitigation and adaptation, energy efficiency, government intervention, and energy security, the authors explore interrelated concepts of law, philosophy, ethics, technology, economics, psychology, sociology, and public policy.

This book offers a much-needed critical appraisal of the central energy technology and policy dilemmas of our time and the impact of these on multiple stakeholders.

## EDUCATION

### SEE Cultural Study Tour to South Korea 2016

Following the mission of enriching the learning experience of our students by broadening their knowledge and enhancing their horizon, like the past, an overseas study tour to Seoul was organized by the School of Energy and Environment during the 2016 summer. The delegation of sixteen students led by Dr. Patrick Sit visited South Korea from 5 to 9 June 2016.

Though the weather was ruthlessly hot, the delegation was excited when visiting sites such as Sudokwon Landfill site (transforming landfill to ecological park), Sihwa-Lake Tidal Power Plant (generating infinite clean energy from the ocean power), Mapo Resource Recovery Facility (using clean incineration technology), THE Green LH (constructing zero carbon building and using Green Technology in living) and Seoul National University (harvesting and reusing rain water).

Throughout the study tour, the group had an opportunity to explore cutting-edge technology in generating clean energies and remediating pollutants.

The off-classroom learning experience is valuable and beneficial as what the Chinese say, “reading thousand books is not as useful as travelling thousand miles”.





Learning and understanding cultural difference is important in personal development. Apart from the everyday encounter with the Korean culture by enjoying the Korean drama and K-pop; or indulging the palate with Korean food in restaurants in Hong Kong, the students also took this opportunity to appreciate the Korean culture by visiting the Gyeongbokgung Palace, N Seoul Tower and Cheong Gye Cheon Museum.



## Summer internship programme 2016 for SEE undergraduate students

In order to broaden the experience and perspective of students and prepare them to better serve the Hong Kong community by extending classroom learning to hands-on workplace, SEE strives to solicit internship opportunities in the industrial and business sectors of renowned organizations.

SEE is pleased to have placed 19 undergraduate students, all majoring in Energy Science and Engineering, in the internship programme supported by the following companies/organizations:

- ATAL Building Services Engineering Limited
- Business Environment Council Limited
- China Aircraft Services Limited
- CLP Power Hong Kong Limited
- Dunwell Petro-Chemical Company Limited
- Jardine OneSolution (HK) Limited
- The Hong Kong Electric Company Limited
- The Jardine Engineering Corporation Limited
- Parsons Brinckeroff (Asia) Limited
- REC Engineering Company Limited



We would like to take this opportunity to express our sincere appreciation to these companies for their continuous support to our School's summer internship programme.

## Update on Student Exchange Programme 2016/17

SEE offers comprehensive studies with a global perspective and an international outlook. Global Services Office (GSO) and the School have shortlisted and interviewed SEE undergraduate students for the institutional and school-level exchange programmes on March 2016. 11 of our undergraduate students will go for exchange study at the following institutions in Semester B, 2016/17:

- Chalmers University of Technology, Sweden
- National University of Singapore
- Syracuse University, USA
- The University of Sheffield, UK
- University of Antwerp, Belgium
- University of Exeter, UK
- University of Groningen, the Netherlands

## Great challenge – building solar car by interdisciplinary student team

The “New Energy New Generation” Solar Car Competition, organized by the Environment Bureau (ENB) and the Electrical and Mechanical Services Department (EMSD) of the Government of the HKSAR, was held on 3 and 10 January 2016 at Hong Kong Science Park. The solar car team named **Morgen City** proudly presented the solar car designed and built by interdisciplinary students for the competition. Through the competition, the students have successfully demonstrated their innovative idea on solar energy harvesting and its applications for vehicle use.



Led by the Team Director, Professor Michael LEUNG, Associate Dean (Undergraduate Studies) and Professor of School of Energy and Environment (SEE), "Morgen City" is an interdisciplinary team comprising 21 students from SEE, College of Business (CB), College of Science and Engineering (CSE), and School of Creative Media (SCM). After more than six months of great efforts and endless devotion of the team members, "Morgen City" has experienced innovation, creativity, leadership and interdisciplinary teamwork in the journey by designing and building a solar powered vehicle to promote wider use of renewable energy for achieving a sustainable environment. The vehicle is also installed with advanced wind power, thermoelectric and photocatalytic technologies; plus state-of-the-art battery and motor. The

successful completion of the solar car marked a brilliant new beginning of student work in developing renewable energy solutions.

Not only does the design of the solar car demonstrates students' engineering capabilities in terms of renewable energy use and energy efficiency enhancement, but also testifies the feasibility of certain innovative applications. By building the solar car with no prior reference from the University, “Morgen City” aims to raise public awareness of the importance of grabbing every opportunity to develop sustainable energy and energy-efficient technologies.

We are very grateful to the following sponsors for their generous support and to the professors at the School of Energy and Environment for their advice and supervision throughout the project.

**Ability R&D Energy Research Centre**  
**Cheong Hing Store Limited**  
**CLP Power Hong Kong Limited**  
**Everspring Global Limited**  
**Faithful Rainbow Limited**  
**GamShing Technology Company Limited**  
**The Hongkong Electric Company, Limited**  
**MotorWave Group**  
**Ove Arup & Partners Hong Kong Limited**  
**Tin Shun Consultants Limited**  
**Totex International Limited**  
**Widex Technology Development Limited**



Professor Michael LEUNG, Dr. Patrick LEE (Assistant Professor of SEE), Dr. Chunhua LIU (Assistant Professor of SEE), Dr. Patrick SIT (Assistant Professor of SEE), and Dr. Denis YU (Assistant Professor of SEE), specializing in photovoltaics, micro wind turbines, thermoelectric materials, photocatalytic self-cleaning surface, computational fluid dynamics, battery and green EV motor, have given constructive advice to "Morgen City", leading the team to success!

The following CityU students successfully completed the competition:

Team Manager: Mr. Stanley Man-Sing LAM (SEE)  
(Management Team)

Team Members: **Energy Source Team**  
Mr. Jay Luyujie CAI (SEE)  
Miss Kennis Ka-Yan CHAN (SEE)  
Mr. Harry Zhi-Kiet LAM (SEE)  
Mr. Martin Shun-Sang LUK (SEE)  
Mr. Tommy Chun-Yin YAP (SEE)

**Mechanical Team**  
Mr. Sam Sin-Cheung CHIK (SEE)  
Mr. Flya Wai-Chung LEUNG (CSE)

**Logistic Support Team**  
Mr. Kayden Chun-Yeung VAN (SEE)  
Mr. Ewan Ying-Wai HO (CSE)  
Mr. Jim Tsz-Hin TANG (CSE)  
Mr. Michael Munyaradzi TAVENGWA (CSE)  
Mr. Meow Yu-Ping TONG (CSE)  
Mr. Paul Chi-Ho WU (CSE)

**Energy Storage Team**  
Miss Daisy Sze-Yan CHAN (SEE)  
Mr. George Tsz-Chung CHAN (SEE)  
Mr. James Yew-Yuen KHONG (SEE)

**Design Team**  
Mr. Pluto Tsz-Nok MOK (SCM)

**Management Team**  
Miss Charmaine Wing-Yin AU  
YEUNG (CB)  
Miss Mary Wen-Hsien HO (CB)  
Miss Ashley Cheuk-Ying LAU (CB)



## SEE Day on 16 April 2016

186 postgraduate students in SEE have graduated since 2010. A reunion gathering for all SEE students (undergraduate, MSc and PhD), staff, and SEE alumni was held on 16 April 2016 (Saturday). The theme of the gathering is “*Alumni and students sharing on energy and environment scenes in Hong Kong*” bringing together 56 alumni and current students.



(From left to right) Dr. Denis YU (Programme Leader of MSc), Mr. MAN Wai Hung Paul (invited speaker), Miss WONG Chung Yan Grace (invited speaker), Mr. WONG Hiu Man Joe (invited speaker), Prof. Chak CHAN (Dean of SEE), Mr. SIU Pui Fung Bob (invited speaker), Mr. SHAM Man Fai (invited speaker)

We are thankful to the 5 invited alumni and students to be speakers who shared their study experience, stories of their success and career prospects in the industry with their classmates and teachers.



## Field Trips

### Visit to Hong Kong Organic Waste Recycling Centre (HKOWRC) on 30 January 2016 (Sat)

In order to raise the awareness of organic waste recycling and ways of recycling in Hong Kong, a group of MSc Energy and Environment students and research degree students taking the course, *SEE5114/SEE8114 Energy, Environment and Sustainable Development*, visited the Hong Kong Organic Waste Recycling Centre (HKOWRC) on 30 January 2016 (Saturday).



During the visit, students learnt about the operations of food waste recycling for the production of animal feed. Various currently on-going demonstration projects in the site include Greenplus Renewable Energy Project for Hydroponics Farm developed by CLP China, and aquaponics system for sustainable food production.

In the aquaponics unit, waste product of one biological system (e.g. waste from fish) is used for as nutrients in the secondary biological system. Integration of fish and plants generate renewable resources providing grower with multiple products. Water is reused and conserved by filtration and recirculation. Therefore, local food provides access to healthy environment and local jobs bridging a circular sustainable economy.

### Visits to ElectriCity on 24 and 25 February 2016

Students taking the undergraduate course, *SEE2201 Introduction to Environmental Engineering*, offered by the School participated in the visits to the “ElectriCity” of CLP Power Hong Kong Limited on 24 & 25 February 2016 (Wednesday & Thursday) respectively.



An on-site tour of the power station was arranged for the students to understand how a real power station functions to bring electricity to their home. Through some fun-filled interactive games, students were introduced how electricity is transmitted and distributed from power plants to users. Such a 2-hour visit would certainly be a good learning activity to the students as some related topics of the course would also be covered in the next class.

### Visit to Zero Carbon Building on 27 February 2016

Students taking the Gateway Education course, *GE1308 Energy: Today and Tomorrow*, offered by the School participated in the visit to the **Zero Carbon Building** on 27 February 2016 (Saturday).

During the 90-minute visit, the latest green building design and innovative technologies to achieve zero carbon emissions in the construction industry locally and internationally were demonstrated. The participating students also had a chance to explore the optimal use of natural lighting and ventilation, and the bio-fuel tri-generation system generating power and providing cooling and dehumidification. Through the showcase at the indoor exhibition and education area, students were amazed by the technologies applied to help raise the community awareness of low carbon living in Hong Kong.



### Visit to Education Path of Electrical and Mechanical Services Department on 10 March 2016

Students taking the undergraduate course, *SEE4112 Energy Systems Analysis*, offered by the School participated in the visit to the **Education Path of Electrical and Mechanical Services Department (EMSD)** on 10 March 2016 (Thursday).



During the 2-hour visit, comprehensive knowledge of various aspects, including energy-related issues, renewable and clean energy technologies, energy conservation programme, development of energy-efficient building services installation, energy data, EMSD's accomplishment, history as well as some events, were shown to the students at the exhibition gallery with 19 interactive exhibits to promote energy efficiency and arouse awareness of the public in renewable energy technologies. The students were also amazed by the operation of a large-scale photovoltaic system consisting of over 2,000 photovoltaic panels in a total area exceeding 3,000 sqm at the viewing gallery.

## Visit to Hong Kong Organic Waste Recycling Centre (HKOWRC) on 7 April 2016

Students taking the undergraduate course, *SEE4001 Engineers in Society*, visited the **Hong Kong Organic Waste Recycling Centre (HKOWRC)** on 7 April 2016 (Thursday).

On the day, the guide of HKOWRC brought the participants a fruitful visit at the Food Education Centre covering the talk addressing the problems caused by food waste, the tour on the food waste processing facilities plus the green facilities and planting equipment.



## Visit to Shatin Sewage Treatment Works on 12 April 2016

Students taking the undergraduate course, *SEE4217 Waste and Wastewater Treatment*, offered by the School went to **Shatin Sewage Treatment Works** on 12 April 2016 (Tuesday).

During the visit, students were inspired by the introduction of the sewage treatment process and storm water drainage services in Hong Kong. The visit strongly enhanced the students' knowledge on wastewater engineering and understanding of the importance of water quality in Hong Kong.



## Visit to Building Facilities and Energy Saving Measures at CityU on 16 April 2016



A group of 26 postgraduate students studying the course, *SEE6102 / SEE8112 Energy Efficiency and Conservation Technologies*, went behind the classroom scenes to visit the building management system room, chillers and cooling towers at CityU on 16 April 2016 to see the operations of essential building facilities such as the chiller plant, cooling tower, and also renewable systems such as solar/hot water. Students understand how buildings energy usages are monitored and controlled.

Briefed by the facility manager, Mr. Percy Kong, students learnt about the 36 extremely practical energy-saving measures which have saved the University millions of dollar each year. Students enjoyed the talk on the Art of Energy Savings. Having energy efficient equipment and innovative ways to reduce excessive energy use (especially for the chiller) are essential, but at the end, it also requires a deep understanding of human psychology and behavior.



## Visit to Zero Carbon Building on 7 May 2016 (Sat)



To expand our students' horizon in the discipline of energy and environment, a group of 33 MSc Energy and Environment students and research students from the School of Energy and Environment visited the **Zero Carbon Building (ZCB)** on 7 May 2016 (Saturday). ZCB is the first Zero Carbon Building in Hong Kong which is a signature project to showcase state-of-the-art eco-building design and technologies to the construction industry internationally and locally and to raise community awareness of sustainable living in Hong Kong. Students had a tour to the eco-office, eco-home, eco-plaza, and viewing-platform at the ZCB to strengthen their knowledge on environmental protection and sustainable construction in the construction industry.



# OUTREACH AND COLLABORATION

## General and Research Agreements and Agreements on Student Exchange Programme

Outreach efforts in the past few months have resulted in the establishment of more collaborative links concluded in agreements for general collaboration, research collaboration and student exchange. The current collaborative agreements include the following:

### General and Research Agreements

- Australia – China Centre for Air Quality Science and Management
- Ewha Womans University, South Korea
- Guangzhou Institute of Energy Conversion, PRC
- Gwangju Institute of Science and Technology, South Korea
- Imperial College of Science, Technology and Medicine, UK
- King Abdullah University of Science and Technology, Saudi Arabia
- Nanyang Technological University, Singapore
- Polo Museale Della Lombardia, Italy
- Seoul National University, South Korea
- Shandong University, PRC
- SINOPEC Fushun Research Institute of Petroleum and Petrochemicals, PRC
- Sungkyunkwan University, South Korea
- The Applied Energy Innovation Institute, HKSAR
- Tokyo Metropolitan University, Japan
- University of Cordoba, Spain



首都大学東京  
TOKYO METROPOLITAN UNIVERSITY



NANYANG  
TECHNOLOGICAL  
UNIVERSITY



جامعة الملك عبد الله  
للعلوم والتقنية  
King Abdullah University of  
Science and Technology



The  
University  
Of  
Sheffield.



UNIVERSIDAD DE CORDOBA



Gwangju Institute of  
Science and Technology



Ministero  
dei beni e delle  
attività culturali  
e del turismo

### Student Exchange Agreements

- Chalmers University of Technology, Sweden
- Ewha Womans University, South Korea
- Ludwig-Maximilians-Universität München, Munich, Germany
- National University of Singapore, Singapore
- The University of Sheffield, U.K.
- The University of Vermont, USA
- University of Bayreuth, Germany
- University of Bremen, Germany
- University of Exeter, U.K.
- University of South Australia, Australia
- University of Western Sydney, Australia
- University System of Taiwan, Taiwan



SUNG KYUNKWAN  
UNIVERSITY(SKKU)



Universität Bremen



CHALMERS



NUS  
National University  
of Singapore



LUDWIG-  
MAXIMILIANS-  
UNIVERSITÄT  
MÜNCHEN



The University of Vermont



WESTERN SYDNEY  
UNIVERSITY



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