

THE SECOND EDITION OF THE 'GLOBAL SECURE' NEWSLETTER

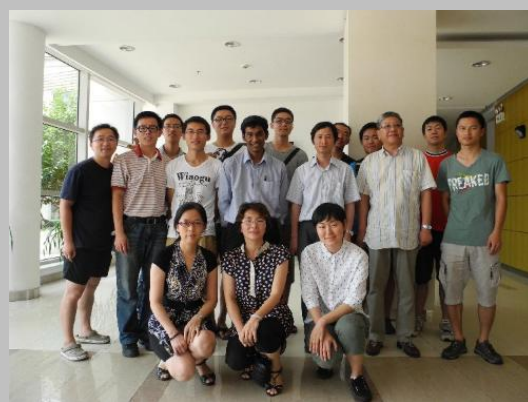
**Welcome to the second edition of the
GLOBAL SECURE newsletter covering the
period: August-October 2012.**

There has been a tremendous amount of new research collaborations between Newcastle University and Chinese Universities since the previous newsletter. This has resulted in innovative research developments, numerous visits between Newcastle and China, stakeholder workshops, seminars, proposals, journal papers and case studies. This newsletter will provide details of the main activities of the themes incorporated on the GLOBAL SECURE project; involving 6 schools within Newcastle University and 13 Chinese institutions.

THEME 2: 'CO₂ CAPTURE AND H₂ PRODUCTION'

Gaurav Bhaduri from Newcastle University has recently returned from working in the laboratory of Professor Wenfeng Shangguan at Shanghai Jiao Tong University (SJTU). Whilst at Shanghai Jiao Tong University, Gaurav Bhaduri delivered a seminar titled: 'Carbon capture and storage using nickel nanoparticles'.

The preliminary test results from the research show that the catalyst is photoactive and that catalytic rates are enlarged in the presence of sunlight, with further experiments planned at Newcastle University. A solar simulator has been purchased for the Newcastle University laboratory to confirm these findings. A Bench combination pH/ORP/EC/TDS/NaCl Meter and software has also been purchased to help with the research work.



THEME 2: VISIT BY NEWCASTLE UNIVERSITY (GAURAV BHADURI – 2ND ROW CENTRE) TO SHANGHAI JIAO TONG UNIVERSITY

The following article has been submitted for publication:

G. A. Bhaduri and L. Šiller, 'Nickel nanoparticles catalyse reversible hydration of carbon dioxide'.

Professor Wenfeng Shangguan at Shanghai Jiao Tong University has submitted a proposal for an international cooperative project to the Shanghai government of China. The proposal will develop new energy and materials and includes Dr Lidija Siller from Newcastle University as an external collaborator. Dr Siller has contributed to the proposal submission based on CO₂ work, signing an agreement to work on the project with China.

Dr Siller has set a provisional date to visit Shanghai and Beijing Universities in December 2012.

A PGRA Dr Mohammad Alamiry was recruited in September 2012 to work on the project.

GLOBAL SECURE

PROJECT THEMES

THEME 3: 'LOW GRADE HEAT DRIVEN COGENRATION OF POWER & COOLING'

Dr Huashan Bao and Mr Constantinos Charalambous from Newcastle University previously visited SJTU in July 2012 to understand the tuning and operation of the adsorption unit for their experimental studies. They obtained a valuable set of test results which are currently being documented. Dr Bao and Constantinos are returning to SJTU China for approximately 1 month in November 2012 to continue the testing phase.

Dr Yaodong Wang visited Beijing Institute of Technology (BIT) and carried out tests on the linear expander (free piston device). The results are very positive and indicate a relationship between pressure and movement of the piston. A report and a future draft journal paper have been created by the PGRA at BIT.

Discussions between Newcastle University and BIT concerning the free-piston design, existing challenges and potential solutions will be undertaken to gain experience and help avoid mistakes in future design stages. After the visit by Dr Mohd Razali Bin Hanipah (Newcastle University) in December 2012, both teams will share information and contribute to a joint paper to document the test results.

“Already there have been a number of joint proposals submitted between Newcastle and Chinese Universities on future research topics”

Paul Watson (GLOBAL SECURE Administrator)



THEME 3: DR YAODONG WANG VISITING BEIJING INSTITUTE OF TECHNOLOGY (BIT) RELATING TO FREE PISTON DEVICE



THEME 6: DR YAODONG WANG, DR BARBARA STURM, MR ERIC VALENCIA & MR RICHARD LAW VISIT A SOY SAUCE FACTORY IN BEIJING



THEME 6: PROJECT MEMBERS FROM NEWCASTLE UNIVERSITY AT A SUGAR PLANT IN LUZHAI, CHINA.

Chinese Universities & Institutions

- SHJT (Shanghai Jiao Tong University)
- IET (Institute of Engineering Thermophysics)
- GU-CAS (Graduate University of Chinese Academy of Science)
- BIT (Beijing Institute of Technology)
- East China Normal University
- University of Hong Kong
- Peking University
- Wuhan University
- Guangxi University
- Dalian Maritime University
- Tsinghua University
- Dalian University of Technology
- China Institute of Water Resources & Hydropower (IWHR)

THEME 6: 'THERMAL ENERGY MANAGEMENT IN PROCESSING' INDUSTRIES'

A two week visit to China by Newcastle University staff in September 2012 resulted in a number of datasets for various thermal energy management case studies. Analysis of the data and a comparative study of both the UK and China results will be undertaken.

Project members: Dr Yaodong Wang, Dr Barbara Sturm, Richard Law, Eric Siqueiros Valencia and Xiangping Chen.

Visits to:-

- Soy Sauce Plant in Beijing
- IET in Beijing
- Jishou, Hunan Province: Spirit Plant
- Jishou University, Hunan Province
- Guiyang, Guizhou Province: Coal Power Plant
- Luzhai, Guangxi Province: Paper Plant
- Luzhai, Guangxi Province: Sugar Plant

It is anticipated that assessment data collected on the successful trip to the various industries will accelerate the research work. It is envisaged that there is sufficient quality data obtained to produce four case studies. The four case studies will cover the soy sauce plant, coal power plant, sugar plant and spirit plant.

"The hospitality shown by all our Chinese hosts was quite incredible".

Richard Law (PhD Student on Theme 6)



THEME 8: VISIT TO PEKING UNIVERSITY BY NEWCASTLE UNIVERSITY STAFF (DR ANIL NAMDEO, PROF. MARGARET BELL & DR PAUL GOODMAN). THE VISIT WAS PART OF A SUCCESSFUL STAKEHOLDER WORKSHOP

THEME 8: 'ENERGY REDUCTION IN ROAD TRANSPORT'

An international seminar and workshop on the theme of "Green Urban Transport" was held by the College of Urban and Environmental Sciences, Department of Urban and Regional Planning at Peking University on the 10th October 2012. The seminar, led by Professor Pengjun Zhao of Peking University brought together experts from across China, with academics from Newcastle University in the UK.

Newcastle University will be hosting a return stakeholder workshop on 'Energy Reduction in Road Transport' on 20th November 2012. It will involve academics and practitioners from the NE of England with Chinese academics to share best practices in traffic management & GHG emission reduction.

For more information check out the Global Secure Website at: <http://research.ncl.ac.uk/globalsecure/>

THEME 7: 'ENERGY REDUCTION IN WASTE TREATMENT'

The research work is underway and progressing well. Dr Tong Zhang from the University of Hong Kong will perform pyro-sequencing on samples collected from Newcastle University bench reactors and also on selected samples from full-scale UK waste treatment plants. Xie Bing from East China Normal University is working with Dr Graham on complimentary energy reducing technologies for industrial wastes related to a manufacturing facility in Suzhou.

Xie Bing and Professor David Graham have submitted a proposal to the Shanghai government to study low-energy treatment of strong N-containing landfill leachates. The outcome will be announced by the beginning of November 2012.

THEME 10: 'SUSTAINABLE RETROFITTING'

The research has started and there are confirmed dates for visits between China and Newcastle University. A number of Chinese academics are linked to both Theme 8 & Theme 10. They include Prof. Zhendong Huang & Prof. Ming Zhang from Wuhan University and Prof. Pengjun Zhao from Beijing University.

Professor Simin Davoudi presented a first paper related to the project at a seminar in Manchester on 13-14th September 2012.