Midlands Energy Graduate School

UNIVERSITY OF BIRMINGHAM · Loughborough University · The University of Nottingham
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MEGS Newsletter

June 2013

News

energYES Young Entrepreneurs Scheme

Network of Energy Centres for Doctoral Training

MEGS Team presenting their business plan.

MEGS Team collecting their trophies for the winning business plan.

Energy Young Entrepreneurs Scheme (Energy YES) 2013

22-24 May 2013, Edinburgh

An opportunity came along for a MEGS team to participate in an inaugural Energy YES competition. The winners of the competition will go on to compete with the Engineering YES winners. A team of five student members of MEGS were brought together: Jingjing Liu and Liu Qu from the University of Nottingham, Mei Qi Chew and Ozak Esu from Loughborough University and Philip Keenan from the University of Birmingham. The uniqueness of the team was that we did not know each other previously.

The team went to Edinburgh with an idea and a positive attitude. The phrase 'what matters most is that we win' was what gave us the victory. The idea which we developed was based on magnetic refrigerators. We created a business plan consisting of the theory of magnetic refrigerators, marketing strategies, financial analysis and much more, to look for potential investors. The business plan not only led to a cash prize of £1000 and beautiful trophies, but also brought our business plan to Birmingham to compete with the Engineering YES winner. The Energy YES provides us with an amazing opportunity to go through the whole process of the commercialization, financial analysis, marketing, etc. Here are some of our experiences from the three-day competition.

Day 1 began with breakfast, followed by a series of workshops on intellectual property, patenting strategy, commercial and marketing strategy, as well as case studies from individuals who had been in academia and have progressed on to start-up and run successful businesses. MEGS Team was assigned mentors for the day who offered a lot of useful and in some cases contradictory advice. This showed us that there are many different routes to achieving success in a start-up company and what works for one business will not necessarily translate to another.

Day 2 had workshops on Finance; raising and managing finance as well as some new case studies. We worked late developing our business idea and plan in time for the competition the next day. By tackling the problems, we have a comprehensive understanding of what a business plan is and how to start a business in a real world.

Day 3 the competition day, saw the MEGS Team victory. We presented our business idea and plan to a panel of judges who are experienced investors in real life energy ideas and we won the first stream of the competition and progressed to the head-to-head stage against the winners of the other stream. We had to present in front of all the judges from both streams again and we were selected as the winner of the 2013 Energy YES competition. We were awarded a group trophy as well as individual trophies, certificates and £1000 prize.

With this valuable experience, we are proud because we delivered the challenging task without prior experience. What is more, it enhanced our confidence that we are capable of working under pressure. Such enjoyable experiences will definitely help us achieve much more in the future.

Article produced by the MEGS team.

Hello,

Welcome to the 12th edition of the MEGS Newsletter! Our June 2013 issue is being published whilst there is lots of work going on to develop the marketing and promotion of MEGS.

Check out our News and Events section to see what we have been up to and what we have to look forward to during 2013.

Welcome to MEGS

We are proud to welcome new members of the Midlands Energy Graduate School. In the June edition we would like to welcome:

From Birmingham
Faihan Alsoqyani,
Nathan Shang, Joshua Vines

From Loughborough
Paula Cosar, Yasir Gill,
Oliver Martin-Du Pan,
Anna Sammarco

From Nottingham
Joel Hamilton, Farooq Sher
Masdar Helmi

We hope that you will find MEGS membership productive and enjoyable.

Best wishes
MEGS Management

More News

2012-2013 Hydrogen Contest Winners To Be Announced at ACT Expo

The Hydrogen DTC team from the Universities of Birmingham, Loughborough and Nottingham are through to the final 8 teams who have advanced to the final phase of the contest. The Hydrogen Education Foundation announced that the winning student teams of the 2012-2013 Hydrogen Student Design Contest will be awarded on June 25 at the ACT Expo 2013, North America's largest conference dedicated to alternative fuels and advanced vehicle technologies in Washington D.C.

The 2013 Contest required student teams to create a feasible plan for implementing a hydrogen fuelling infrastructure for fuel cell vehicle travel in the Northeast and Mid-Atlantic.

MEGS Public Engagement Manager

Nicola Smith

Nicola Smith is a public engagement practitioner who has been working in university outreach and engagement for almost a decade. She has extensive experience of designing, planning and leading public engagement activities for research groups and institutions in the areas of bioscience, education and energy. She has been working as Public Engagement Manager for the Network of Energy Centres for Doctoral Training for the past 18 months and from 1 June will also be looking after Impact and Public Engagement for MEGS.

She hopes to meet as many of you as possible in the coming months and is happy for you to contact her if you need advice or assistance with anything related to the communication of your research work to the public and policymakers, particularly:

- Planning and delivering public engagement and impact events
- Communication and public engagement training
- Bid writing support for public engagement funds
- Policy engagement events
- Public debate and dialogue activities

She can be contacted currently on:

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We will circulate her new contact details as soon as we have them.

MEGS Marketing

A huge thank you to all of the students who took part in the photoshoots at each of the universities, the photos and videos are great and will be used for the website and the new marketing materials.

We are currently re-developing the website, once it is all up and running we'll let you know. Make sure you have a look and let us have any feedback.

MSc Efficient Fossil Energy Technologies

MEGS is proud to announce the launch of its first collaborative taught Masters: MSc in Efficient Fossil Energy Technologies, available in 2013 for students at the universities of Nottingham and Birmingham, and at all three MEGS universities from 2014. Consisting of 60 credits of core modules, 60 of optional modules and a major, 60 credit research project, students will be able to tailor their studies according to their personal research/technological preferences. The core modules include power generation & carbon capture, social and economic aspects of the energy market, research skills and innovation. Students will be able to choose their options from a substantive list, available from all three MEGS universities, via video lecture, distance learning or in person, making this a highly flexible programme. The major research project is taken during the May-September period and will be based on a choice of projects, supervised from the university at which the student is registered, and MEGS is expecting to offer industrially-focussed projects as well as specialist research topics.

This MSc will prepare future leaders and industrial engineers with knowledge and skills to tackle the major national and international challenges of implementing new fossil-based power plant and processes with near zero emissions and CO_2 capture. It can also provide an entry route for students to progress to PhD study upon successful completion.

For more information on MSc Efficient Fossil Energy Technologies, for study at any MEGS university, please contact Dr Chen-Gong Sun, Programme Director, on **cheng-gong.sun@nottingham.ac.uk.**

New Supergen Award for MEC

Engineering Safe and Efficient Hydride-Based Technologies
(RCUK Supergen Initiative, £1.2 million)
Investigators
Nottingham: Gavin S Walker, David M Grant, Carol N Eastwick, Alastair Stuart
Birmingham: David Book,
Loughborough: Weeratunge Malalasekera, Salah Ibrahim

Summary

Imagine providing a small, safe and energy efficient hydrogen refueller that can be installed in a domestic garage or industrial warehouse that will ensure that consumers can have an easy and resilient method of refuelling, reducing the reliance on refuelling stations whilst the hydrogen economy infrastructure develops. Current technology provides options which are bulky, take a long time to refuel and require storage at high pressures. This work uses metal hydrides as a solid state storage option for hydrogen, reducing the pressure at which hydrogen is stored and reducing the spatial footprint, at the same time using a metal hydride compressor to provide further compression of hydrogen to on-board vehicle requirement levels. The challenge is in designing a compact system that can deliver the flow rates of hydrogen to compete with conventional petrol refuelling or by providing an alternative method that fits in with the lifestyle of a consumer. This work is meeting that challenge and ensuring that it puts safety at the forefront of its design philosophy. Fundamental modelling is required to underpin this work, with materials developments combined with advanced mechanical design to deliver a robust safe design of system and components.

9th International Fuel Cell & Hydrogen Conference, Partnering & Exhibition 2013 from Materials Research to Ramping up Production'

20-21 March 2013

The Conference was organised by the University of Birmingham (Professor Steinberger-Wilckens) and Climate Change Solutions (Managing Director Tony McNally); co-sponsored by UK Trade & Investment and Midlands Energy Graduate School (MEGS), represented by Dr Bushra Al-Duri (University of Birmingham) and Dr Jung-Sik Kim (Loughborough University).

The 2 day event offered unique insights into the political, economic and technological advances. 40 MEGS students attended, together with 200+ other delegates. Each day consisted of a morning session with presentations by leading academics, industrial organisations and Government, with the afternoons comprising parallel workshops focusing on more specific aspects and themes, including Materials, Hydrogen Production and Storage, Low-cost Manufacturing, Novel Concepts, Fuel Cells for Transport, Fuel Cells for Stationary Applications, Safety and Socio-economic Considerations. As a result, attendees were able to become familiar with the latest technical and commercialisation opportunities in Hydrogen energy research, and gain greater understanding of Government policy on fuel cell research and Hydrogen infrastructure.

Throughout the 2 days, there was significant contribution by research students from across the UK, through poster presentations of their work.

At the closing ceremony, Dr Bushra Al-Duri, Deputy Director of MEGS, presented prizes to the best 3 posters. The winner was Tau Li from University College London, 2nd place went to Jessica Gould, University of Nottingham and 3rd place went to Dan Symes, University of Birmingham.

Presentations from the day can be found at
www.climate-change-solutions.co.uk/Hydrogen2013.php

Royal Geographical Society with the Institute of British Geographers

Postgraduate Mid-Term Conference 2013, 25-27 March 2013, University of Birmingham

The RGS-IBG 2013 Postgraduate Mid-Term Conference is a friendly and supportive event that encourages postgraduate researchers, at any stage in their studies, to engage in debates, present their research and collaborate with other postgraduate researchers in a welcoming and supportive environment.

The Energy, Society and Place Research Unit (ESPRU) at GEES was keen to participate in this event and, with support from MEGS, hosted a series of energy themed sessions. The sessions were designed to build and develop emerging themes in postgraduate research on energy related projects and encourage discussion with both existing energy researchers and those with an interest in the field.

Four activities were undertaken:

(1) Paper Session 1: Energy Sustainability: Community Behaviour

(2) Paper Session 2: Energy Security Transitions: Case Studies

(3) World Café Workshop: Energy Security Challenges and Transitions: Current Affairs

(4) Poster Presentations: Open Energy Theme

The paper sessions were very successful, with both sessions oversubscribed. In all, 14 delegates were funded by the MEGS grant to present their work: 11 researchers from across the country presented their work in the paper sessions and a further 3 poster presentations were incorporated into the conference poster session.

In addition, an energy based world café workshop was held to encourage debate around current affairs in the field which included both existing MEGS members and non-energy postgraduates, and was hosted by a leading academic, Professor Stefan Bouzarovski, University of Manchester (formerly University of Birmingham).

Key Outcomes

The MEGS sponsored energy sessions provided an opportunity for a significant number of postgraduate researchers examining energy issues to come together and discuss the current challenges in their field. The postgraduate researchers are early in their academic careers and a specifically tailored session helped develop debate and research practices.

MEGS Energy Future Debate

Tuesday 14 May 2013, University of Birmingham, Loughborough University & University of Nottingham

In this unique online event from MEGS, three world-leading researchers presented 20 minute master-classes that explored the facts in their fields.

The event hosted almost 60 students, academics and SMEs across the three video conferencing rooms. After tea and cakes (and a few initial technical glitches!) the event kicked off with Paul Rowley welcoming Prof Richard Williams, Pro Vice Chancellor from University of Birmingham, who opened the debate.

The first master class ***The Future for Nuclear Energy in the UK*** was presented by ***Prof Martin Freer***, University of Birmingham, who evaluated the role of nuclear new build generation. This is especially topical given the forthcoming "strike price" to be offered to EDF for generating electricity from their new nuclear power stations.

Then ***Prof Simon Watson***, Loughborough University explored ***the Role of Off Shore Wind in our Energy Future***, using the recently commissioned 630MW Thames Array offshore wind farm as a case study.

Finally, ***The Role for Coal and Gas with Carbon Capture and Storage (CCS)*** in the UK electricity mix to 2050 was examined by ***Prof Colin Snape***, University of Nottingham. He described the current status of fossil fuel-fired generation, and the prognosis for coal fired plant, biomass conversion and CO_2 sequestration.

A novel new feature of this event is that the debate continued on-line. A survey to reflect the MEGS community's views on potential energy future scenarios was completed on-line after the event. Finally, an interesting outcome was the enthusiasm for real-time online access to the debate, which we will work to make available at future similar events.

Mayfest, The University of Nottingham's Open Day for the Community

18 May 2013

The University of Nottingham opened its doors for the local community, putting on a stunning display of what the university has to offer for adults and children of all ages. MEGS were represented by a group of 1st year EngD students from the Efficient Fossil Energy Technologies Group who pulled out all the stops for their display of "the great energy challenge."

EngD students doing demonstrations at May Fest.

Visitors were entertained with demonstrations of dry ice bubbles and liquid nitrogen and challenged with quizzes on renewable energy and the siting of power plants. The more adventurous got to try their hand at generating their own electricity, racing solar powered cars and letting off CO_2 powered cork guns.

Posters covering energy related developments such as biomass and carbon capture and storage kept mum and dad interested while the full light up model of Ratcliffe on Soar power station delighted both young and old.

Early Career Symposium and Research Colloquium on Energy Vulnerability Conditions and Pathways: Towards a research and policy agenda

21-23 May 2013, Manchester

The early career research symposium on the topics of spatial and temporal dynamics of energy vulnerability was held from 21-23 May 2013 at MERCi, Manchester. The event was a joint initiative of the Energy Geographies Working Group (EGWG) of the Royal Geographical Society-Institute of British Geographers (RGS-IBG), and the International Energy Vulnerability Network (IEVN) and was supported by the Meeting Place of the UK Energy Research Centre (UKERC).

The symposium had 20 papers presented from both UK and international based PhD students and post-doctoral fellows drawing on the themes (1) Interpreting fuel poverty via a vulnerability/resilience lens (how does this challenge conventional approaches?); (2) Social justice and energy vulnerability (fuel poverty in terms of recognition, procedure and distribution); (3) Energy vulnerability and decarbonisation (what is the relationship between policy measures promoting the low-carbon economy, and rates of fuel poverty?); and (4) Fuel poverty and local, area-based interventions (do they provide a viable way forward?)

It brought together various academic researchers, policy representatives, and the third sector to discuss on the 'pathways to vulnerability' through which individuals, communities, places and states are affected by the relationships between energy affordability, housing stock issues, and household practices and needs.

Events 2013 Be sure to put these dates in your diary.

MEGS IV Annual Conference 12 & 13 September 2013, Holywell Park, Loughborough University

The theme for the conference is public engagement. Agenda and registration details to follow, as always there will be a chance to present a poster of your research.

Public Engagement is of vital import if we are to ensure public acceptance and support for novel energy technologies and business models in the future. These may well include aspects of your current research. Increasingly research funders are expecting public engagement to be part of funded research programmes and industry is having to enter into a dialogue with policy makers and the general public in relation to their plans for the deployment of new energy technologies. This year the MEGS conference will focus on giving you the skills and knowledge that you need to address public engagement in the energy sector in the future. It will include a half-day media training session to equip you with an understanding of how to talk to the media. You will hear from funders about why they believe public engagement is important. You will hear from academic experts working on public engagement in relation to ccs, wind farms and nuclear energy for example. And finally you will hear from peers who are active in public engagement and will learn how you can get involved.

MEGS IV Christmas Conference, 12 December 2013, The Barber Institute, University of Birmingham

The Christmas Conference will be held on 12 December 2013, at the Barber Institute, University of Birmingham; put the date in your diary, agenda and further details to follow.

Seminar Series

We are currently developing a programme of lectures for a 12 month MEGS Seminar Series. This will hopefully run in the afternoon of the second Wednesday of every month. We will be inviting between 6-12 leading national speakers to come.

The Centre for Renewable Energy Systems Technology (CREST) is celebrating its 20th birthday, Friday 5 July 2013, Loughborough University

CREST is having a celebration event to mark 20 years of being a research centre. There is a full day of activities, talks, demonstrations and memorabilia to mark the occasion and get everyone together.

Although the day events are free, places are limited by the venue, registration is required by booking online **www.lboro.ac.uk/departments/eese/news/events/crest20.html**

3rd Low Carbon Energy for Development Network Workshop (LCEDN) Private Sector Roles in Low Carbon Energy Solutions to the Climate Challenge 24 & 25 June 2013, Wellcome Trust, London

"How to create effective markets for low carbon energy solutions that ensure equitable and widespread access to energy services in the Global South?"

The event will feature presentations from a range of large and small-scale private sector organizations, academics from a range of different disciplines, NGO and Civil Society groups, as well as representatives from the UK Department for International Development (DFiD) and the UK Department for Energy and Climate Change (DECC).

For further details, and registration go to: **www.eventbrite.co.uk/event/6676330083#**

The Centre for Renewable Energy Systems Technology (CREST) Wind Power Summer School, 1 – 4 July 2013, Loughborough University

With global wind power capacity now standing at over 120,000MW, the industry continues to expand rapidly. In response to the demand for more trained personnel across the sector in the UK and worldwide, CREST runs an annual short course. Covering key aspects of the wind power industry, this highly popular course is designed to meet the needs of engineers and project developers but is also suited to the non-specialist.

Full programme details can be found at: **www.lboro.ac.uk/departments/eese/news/events/wind-power-summer-school-2013.html**

Keep an eye on the events section of the MEGS website for updates and also look out for emails!

M E C

Midlands Energy Consortium

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MEC

It has been another busy period for academics working in the Midlands Energy Consortium. We put in three strong collaborative proposals for the national Centre for Doctoral Training call and I am delighted to say that all three have gone through the outline stage. We are now working hard to turn these proposals into winning projects at the next stage. The MEC collaborative proposals, each involving all three partners, are:

- Fuel Cells and their Fuels (in collaboration with University College London and Imperial College)
- Carbon Capture and Storage and Cleaner Fossil Energy (in collaboration with Leeds University)
- Functional Energy Materials

The individual MEC universities are also progressing to the next stage with some other energy-related CDT proposals.

Funding

The following funding opportunities are available:

Collaborative Research Programme in Decommissioning, Immobilisation and Management of Nuclear Waste
The Research Councils' Energy programme invites research proposals from the outputs of the scoping workshop held on the 01 May 2013.

- **Issued:** 08 May 2013
- **Closing date:** 27 June 2013

EPSRC-NSFC call for collaborative research with China on Grid Scale Energy Storage for Intermittency
EPSRC, as part of the RCUK Energy Programme, wishes to develop collaborative projects between the UK and China, in partnership with the National Natural Science Foundation of China (NSFC), in the field of 'Grid Scale Storage for Intermittency'.

- **Issued:** 14 May 2013
- **Closing date:** 02 July 2013

SUPERGEN Hydrogen Challenge call
Proposals are invited for collaborative research projects to undertake fundamental research that will advance the case for Hydrogen as an energy vector. For each project application there should be a single submission with a single PI.

- **Issued:** 23 May 2013
- **Closing date:** 01 August 2013

Recent awards

Robust Lifecycle Design and Health Monitoring for Fuel-Cell Extended Performance (RESILIENCE): Dr L Jackson with partners in Loughborough and Nottingham. £909k

The UK has a commitment to reduce greenhouse gas emissions by 80% by 2050. To achieve this in the UK energy sector has to migrate towards supplying innovative, high quality, highly reliable, low or zero emission energy generation sources. Hydrogen and fuel cells have emerged as potential initiatives that could serve as alternative energy sources. They are currently being engineered for a range of applications including automotive, stationary power, aerospace and consumer electronics. Each application presents its own set of requirements for the fuel cell system including performance, operating range and cost. With the introduction of a new technology into markets, where existing products are highly reliable, requires that this aspect of the system performance must match customer expectations which are demanded for a new product. The area of focus of this research aims to improve the durability and reliability of this new energy source by better system integration and design optimisation, coupled with effective health management to maximise the life of the power source. The outcome is a real time dynamic and adaptive intelligent lifecycle infrastructure with leading edge research in system design for reliability, prognostics and diagnostics, and semantically modelling relationships been the product and the environment for fuel cells, achieved through a multidisciplinary approach, including the areas of mathematics, information science and engineering. The dividends both in design efficiencies and lifecycle management can be achieved placing hydrogen and fuel cell power sources at the forefront of future UK energy provision.

PV2025 - Potential Costs and Benefits of Photovoltaics for UK-Infrastructure and Society: Prof R Gottschalg with partners in Loughborough and Imperial. £1.02M

The installation of photovoltaics today is largely evaluated in terms of quantity and the success of any market stimulation evaluated on the basis of how well the targets are met. This may cause significant problems for the national infrastructure and may lead to significant unnecessary costs for grid stabilisation. However, these factors are sometimes assessed too simplistically. When considering PV in a national context, it is also largely seen as a homogenous swarm of devices, i.e. all of them reacting rather similarly. This does not consider different

orientations (system elevation determines the seasonal maximum, system orientation determines the daily maximum) or regional differences in the environmental conditions such as weather fronts passing in a matter of days over the country rather than instantaneously or the North experiencing a different weather front than the South; nationwide smoothing might very well limit the need for power control. Thus the overarching question in this proposal is 'How can we maximise the benefits and limit the costs for UK plc while having a vibrant PV market?'

Energy Literacy for Decentralised Governance: Dr E Brown and colleagues in Loughborough. £108k

Over the last ten years African governments have moved increasingly towards decentralised budgets, giving local authorities increased powers and budgets to govern areas that include both rural and urban population. Yet while cities have a municipal authority to consider new ways of supplying energy to its urban citizens, those governing Africa's rural poor in small and medium towns in the surrounding rural hinterlands have rarely considered energy infrastructure. Existing research indicates that many local authorities in Africa are struggling as they do not have the capacities and capabilities necessary to govern the complex social, political and economic situations they routinely face. Required to contribute inter alia to financial management, local and regional economic development, strategic planning in the local government, budgeting procedures, tax collection, procurement procedures and standards, ethics for local government staff and elected representatives, and action against corruption, it is hardly surprising that against this backdrop the demands placed on their time and capabilities would see energy planning neglected. And yet energy - in particular, clean energy for development - is becoming increasingly important not just to them in their specific geographical location, but to the wider region and world more generally. Local authority capacity across Africa therefore poses a fundamental challenge for successfully implementing clean energy for development programmes. In short,decentralisation could open the way for local authorities to become champions and drivers towards cleaner energy, but at the same time, their lack of capacity and capabilities is currently proving a major barrier to implementing clean energy development in African states. For sure, improving the understanding and evidence base of both the opportunities and challenges associated with implementing clean energy for development in Africa and it is this lacuna which this proposed research seeks to address.

Solar Nano-Grids: An appropriate solution for meeting community energy needs? Dr E Brown and colleagues in Loughborough University. £400k

The increasing success of Solar home systems over recent years (in terms of the number of installations) is undoubted. There is now a relatively wide literature documenting the successes and limitations of different business models in facilitating the growth of the sector, as well as a growing literature documenting the immediate impacts of access to electricity via SHS upon issues as diverse as health, education, security, access to information/communications and income. What is clear, however, is that, whilst a household undoubtedly gains developmental benefits from purchasing or hiring an SHS (removing the air pollution caused by kerosene lamps, providing light for children or other members of the household to study, enhanced security, access to information etc.), the degree to which this addresses the poverty of the members of the household and, for example, their ability to generate income is far less clear. In fact, the evidence tends to suggest that it does not and in some cases actually imposes additional financial burdens. In addition, the economic advantages of SHS over other means of accessing lighting and electricity for running small appliances especially for low-scale users is not yet proven and the costs of SHS still put it beyond the pockets of many of the poorest.

Within this context, the research team behind this proposal has developed the concept of Solar Nano-grids as one potential way of addressing some of the limitations of SHS. The nano-grid concept is based on the idea of the SHS, where the basic electricity needs of the households are met, but at the same time it proposes the incoorporation of some small scale agricultural or industrial applications (like irrigation). This takes advantage of the fact that houses are frequently clustered together in rural areas in groups of 15-20 houses within a diameter of less than 150m. In the proposed nano-grid system, a basic, say 1.5 to 3kWp, PV system is installed in a small cluster of households within a short radius of each other (ideally 60-70m) and power is distributed to the households from this system.

Understanding the barriers to the introduction and uptake of clean/ improved cookstoves in Southern Africa. Dr M Clifford and colleagues in University of Nottingham. £685k

This project seeks to understand the barriers that have prevented the large-scale uptake of improved cook stoves in Southern Africa. By learning from successful projects in East Africa, a roadmap to overcome these obstacles will be produced.

It is estimated that 2.7 billion people worldwide, who mostly live on incomes of less than US$2/day, depend on solid biomass fuels (fuelwood, charcoal, animal dung, grass, shrubs, agricultural residue) to meet their basic energy needs for cooking and heating. Many of these people cook on open fires, often inside their homes. As well as being very inefficient in the use of scarce firewood, women and children are exposed to harmful levels of wood smoke, which is a major cause of respiratory disease and premature death. Cook stoves are estimated to contribute around a third of global carbon monoxide emissions while the black carbon particles and other pollutants in biomass smoke are also thought to play a role in global warming.

For more information, please contact:

MEGS Administrator
t: +44 (0)115 846 7661 **e:** megs-administrator@nottingham.ac.uk **w:** www.megs.ac.uk

Student Feedback

We welcome all feedback from MEGS students. Please email the MEGS Administrator with your thoughts and ideas on what we can do in the next year to move forward or to provide any feedback from past Events.

We hope you all have a great summer break.

Apply online for your MEGS Certificate

Remember that now you can apply for the MEGS Certificate using the application form at our Alumni section. The certificate will list not only how long you were a member of MEGS, but also what events you attended and the awards you received. After we receive your application form, your certificate will be printed out and mailed to your address, or may be collected from our office in the Energy Technologies Building, Innovation Park, Jubilee Campus, Nottingham.

If you are in need of any further information, please contact:

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