

Local solutions to climate change

The Ashden Awards Imperial College Conference

Wednesday 10 June 2009

G16, Sir Alexander Fleming Building, Imperial College,
Imperial College Road, London, SW7 2AZ

The Ashden Awards for Sustainable Energy reward and promote excellent local sustainable energy solutions in the developing world and in the UK. These innovative schemes are addressing climate change, alleviating poverty and improving quality of life.

In this conference, hosted by the Ashden Awards in partnership with Imperial College, London, the 2009 International and UK Ashden Awards finalists will talk about the key achievements that have contributed to their success. The conference will be chaired by Dr Anne Wheldon, Technical Director of the Ashden Awards.

Programme

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| 09:30 | Registration and refreshments |
| 10:00 | Welcome and introduction to the day: Professor Sir Brian Hoskins
Director of the Grantham Institute for Climate Change, Imperial College |
| 10:10 | Session 1: Buildings for the future |
| 10:15 – 10:25 | Jonathan Hines (Architype, UK)
Reducing energy demand through people-focused building design |
| 10:25 – 10:35 | Vincent Stauffer (GERES, India)
Solar greenhouses producing fresh vegetables in the Himalayan winter |
| 10:35 – 10:50 | Questions |
| 10:50 | Session 2: Green energy businesses |
| 10:55 – 11:05 | Max Lacayo Cortes (ECAMI, Nicaragua)
Supporting rural development with photovoltaic power systems |
| 11:05 – 11:15 | Abasi Kazibwe Musisi (Kampala Jellitone Suppliers, Uganda)
Agricultural residues fuelling industries and institutions |
| 11:15 – 11:25 | Patrick Sherriff (Geothermal International, UK)
Design and installation of ground source heating and cooling systems for the commercial sector |
| 11:25 – 11:45 | Questions |
| 11:45 – 12:15 | Refreshments |

(programme continues overleaf)

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12:15 Session 3: Mobilising communities

- 12:20 – 12:30 Samson Tsegeye (Solar Energy Foundation, Ethiopia)
Bringing affordable photovoltaic lighting to communities
- 12:30 – 12:40 Melanie Sealey (Devon County Council, UK)
Renewable Energy 4 Devon: generating employment by supporting renewable energy businesses and customers
- 12:40 – 12:50 Richard Davies (MEA, UK)
Motivating communities to reduce carbon emissions
- 12:50 – 13:10 Questions
- 13:10 – 14:00 Lunch

14:00 Session 4: Radical carbon cuts

- 14:05 – 14:15 John Doggart (Sustainable Energy Academy, UK)
Old Home Superhome: Inspiring people to retrofit through practical exemplars
- 14:15 – 14:25 Vivek Gupta (Saran Renewable Energy, India)
Replacing diesel generators with biomass gasification systems
- 14:25 – 14:40 Richard Dunne (Ashley C of E Primary School, UK)
Antarctic expedition inspires carbon saving at a primary school
- 14:40 – 15:00 Questions
- 15:00 – 15:30 Refreshments

15:30 Session 5: Scaling up

- 15:35 – 15:45 Phil Webber (Kirklees Council, UK)
Rolling out insulation across a large metropolitan borough
- 15:45 – 15:55 Dean Still (Aprovecho Research Center and Shengzhou Stove Manufacturer, USA/China)
Mass production of efficient fuelwood stoves
- 15:55 – 16:05 Suresh Subramanian (IDEI, India)
Treadle pumps increasing income and quality of life for poor farmers
- 16:05 – 16:25 Questions
- 16:25 – 17:30 **Taking low carbon to the masses:** Innovative marketing of sustainable energy
Introduced by Martin Wright, Editor in Chief of Green Futures Magazine, with presentations from finalists IDEI and Kirklees Council
Followed by time for networking

Please confirm attendance to conference@ashdenawards.org

2009 Ashden Awards finalists

A short summary of the achievements of each finalist is given below. Full descriptions of their work will be available at the seminar, and also on the Ashden Awards website.

International finalists

Aprovecho Research Center and Shengzhou Stove Manufacturer, USA/China

Dean Still

Mass production of efficient fuelwood stoves

Shengzhou Stove Manufacturer (SSM) has worked with the Aprovecho Research Center to develop a portable fuelwood stove for volume production which is cheap and efficient. Stoves are manufactured in the SSM factory in China and are sold to distributors. The Aprovecho 'rocket' stove design uses precise internal dimensions to control the flow of air, in order to burn the wood cleanly and transfer heat efficiently to the cooking pot. Tests show reductions of 40% fuelwood use and 50-70% carbon monoxide and particulate emissions compared to a traditional fire, with between one and two tonnes/year CO₂ saving per stove. SSM has sold 60,000 stoves since 2008, over 90% to Envirofit International, a US-based non-profit organisation which markets the stoves in India, supported by the Shell Foundation. Other customers include stove programmes in South Africa, Madagascar, Tanzania, Argentina and Chile. SSM aims to have sold over one million stoves by 2015.

ECAMI (Empresa de Comunicaciones), Nicaragua

Max Lacayo Cortes

Supporting rural development with photovoltaic power systems

ECAMI is a family business, founded by Luis Lacayo in 1982 to sell and install radio-communications systems in remote areas. Solar photovoltaics (PV) were the ideal way to power these systems, and the business diversified into providing high-quality PV equipment for other applications, and also different renewable technologies. ECAMI has grown rapidly over the past four years and installed over 400 kWp of PV, in 2,000 solar home systems and 560 larger systems for other services. These include light and communications for schools and police stations; vaccine and blood refrigeration for clinics; pumps for village water supply; entertainment and battery-charging for tourist facilities; and power for mobile phone masts. In addition, ECAMI has installed solar water heaters and wind turbines. ECAMI wants to sustain its growth in a range of renewable energy services, and in particular to help rural people increase their income.

GERES (Groupe Energies Renouvelables Environnement et Solidarités), Ladakh, India

Vincent Stauffer

Solar greenhouses produce fresh vegetables in the Himalayan winter

Working closely with other NGOs, GERES designed a highly insulated, heat-retaining greenhouse, with controlled natural ventilation. This is built cheaply by masons and villagers in Ladakh, Lahaul and Spiti, using mainly local materials. The greenhouse is heated only by solar energy, yet enables vegetables to grow throughout the year, even in winter when the outside air temperature falls below -25°C. Since 2005 nearly 600 greenhouses have been built, mainly for individual families. GERES provides partial funding, and other NGOs give training and maintenance support. Owners and their communities benefit from eating fresh vegetables in the winter, and owners have significantly increased their income through selling vegetables and seedlings. About 460 tonnes/year CO₂ is saved from avoiding the transport of vegetables. GERES wants to expand the use of greenhouses by families and small businesses around Ladakh, and to promote the technology and approach in other cold, sunny regions.

IDEI (International Development Enterprises India), New Delhi, India

Amitabha Sadangi

Treadle pumps increase income and quality of life for poor farmers

IDEI won a first prize Ashden Award in 2006 for developing and supporting a supply chain which had provided treadle pumps to farmers in India. The low-cost pumps replace the use of diesel pumps, and enable poor farmers to grow an additional crop each year, improving nutrition and more than doubling farm incomes. The work of IDEI has expanded and diversified, supported by their innovative marketing approach. With trained people working under license along the supply chain (manufacturing, selling and installing pumps) IDEI has now provided 750,000 pumps, reaching new areas in Chhattisgarh, West Bengal, Uttar Pradesh, Bihar and Orissa, and saving on average 0.48 tonnes/year CO₂ per pump from replacing diesel. Independent research has shown that children benefit significantly when their family owns a treadle pump, through improved education and nutrition, and no overall increase in labour is required from them. Since 2004 IDEI has also worked on drip irrigation systems, which reduce the water and thus the energy needed for irrigation, and a similar supply chain approach has provided 295,000 of these systems.

Kampala Jellitone Suppliers, Uganda

Abasi Kazibwe Musisi

Agricultural residues fuel industries and institutions

Kampala Jellitone Suppliers, a coffee-processing business, started to produce briquettes made from agricultural residues to provide a cheaper fuel for roasting coffee. Because of market demand, the business diversified into selling briquettes and the stoves to burn them. Currently about 130 tonnes/month of briquettes are sold to 31 large institutions (schools, universities and hospitals) for cooking, and to five factories for producing heat, as well as to a few domestic customers. Using residues (which were often just burned as waste in the past) reduces deforestation, and saves about 9,300 tonnes/year CO₂. Cooks like briquettes, because they are clean and easy to handle and reduce cooking time. Kampala Jellitone Suppliers is currently moving to larger premises, to increase production capacity in order to meet the growing demand for briquettes. It will then also target the domestic market.

Saran Renewable Energy, Bihar, India

Vivek Gupta

Replacing diesel generators with biomass gasification systems

Saran Renewable Energy (SRE) was started by a family-run agricultural trading business, in response to the severe shortage of electricity in Bihar. SRE generates electric power for eight hours per day by gasifying biomass, and using the cleaned gas, with about 12% diesel for ignition, to run a 128 kW dual-fuel engine. Most of the biomass is 'dhaincha', a local woody plant which grows in water-logged areas that cannot be used for crops. Electricity is currently sold to ten businesses which previously used diesel generators, because the grid supply is so unreliable. Some of these businesses sell the electricity on to smaller users. Electricity also powers a borehole pump, which supplies water to customers. The biomass-generated electricity prevents the emission of about 100 tonnes/year CO₂ from diesel, provides a better-quality electricity supply, and supplements income for biomass producers. As customer demand increases, SRE plans to increase the capacity of the plant, and set up similar plants in other parts of Bihar and elsewhere.

Solar Energy Foundation, Ethiopia

Samson Tsegeye and Harald Schutzeigel

Bringing affordable photovoltaic lighting to communities

The Solar Energy Foundation (Stiftung Solarenergie) developed and piloted a small photovoltaic (PV) solar-home-system, which powers two fluorescent or four LED lights. At the request of the village of Rema, which did not want electrification via a diesel generator, the Foundation supplied an initial 1,000 solar-home-systems. These proved so successful that the Foundation provided a further 1,100 systems to outlying areas, and built a centre to provide technical and management training for solar technicians. The solar lights have replaced kerosene lamps in homes, and led to improved education for both children and adults in schools. Local collectors are paid to collect monthly fees from owners of solar-home-systems, and systems can be disabled and reclaimed if fees are not paid. Trained technicians are now setting up four new solar centres, and through these the Foundation aims to provide PV electrification in different regions of Ethiopia.

UK finalists

Business

Architype

Jonathan Hines

Reducing energy demand through people-focused building design

Architype is an architectural practice which for 25 years has designed buildings with high environmental specification. Key to their success is working closely with clients, before and after the building is constructed, to ensure that the client likes the design and knows how to use the building efficiently. Buildings achieve high operating energy efficiency, and thus low carbon emissions, through high levels of insulation, passive solar gain and natural ventilation. Using wood, rammed earth and cement-free construction minimises embodied energy and carbon. The 29,000 m² of Architype-designed buildings completed in the past five years save an estimated 29% on energy and 36% on CO₂ compared to 2006 building regulations. The % savings are higher for CO₂ than energy because renewable sources like biomass are often used for some of the energy supply. Designs continue to improve, so the 34,000 m² of buildings to be completed in next two years should save 65% on energy and 75% on CO₂.

Geothermal International

Patrick Sherriff

Using heat pumps to provide heating and cooling to large public buildings

Geothermal designs and installs heat pump systems, mainly for large, new-build public and commercial buildings. Heat pumps extract heat from the ground or a water source, and supply it at a higher temperature to the building; in reverse they provide cooling. Many new buildings use the innovative 'Energy Piles' approach, in which the ground loops of the heat pump are embedded in the concrete piles of the building. Over the past six years Geothermal has installed 100 MW capacity (about 60% for heating and 40% for cooling) in 700 domestic and 85 large scale heat pumps. Many large systems provide both heating and cooling, and in doing this achieve very high coefficients of performance, because the ground starts off cooler in summer and warmer in winter. Systems installed to date save about 25,000 tonnes/year CO₂, compared with gas boilers for heating and conventional air-conditioning.

Charity

Marches Energy Agency (MEA)

Richard Davies

Motivating communities to reduce carbon emissions

The Low Carbon Communities programme of MEA works with households, businesses and groups (like chambers of commerce, churches and environmental organisations) within a community to identify the best ways for that particular community to reduce CO₂ emissions. Support is also provided to develop sustainable energy businesses. MEA helps to source expertise and funding for measures such as insulation, efficient lighting for businesses and renewable energy installations. To date MEA has worked with six small rural communities, with about 1,400 technical measures installed and over 1,400 tonnes/year CO₂ saving. Even though only a proportion of the community is actively involved with the programme, the CO₂ reduction for the whole community can be 4%. Community groups are motivated and encouraged to continue when the active support has finished. New programmes are starting in both rural and urban communities.

Sustainable Energy Academy (SEA)

John Doggart

Showing how carbon emissions from homes can be radically reduced

SEA has set up a network of homes, mostly built before 1919, whose owners have installed measures to reduce their carbon emissions by 60% or more. Measures include roof, cavity-wall, solid-wall, and under-floor insulation; triple glazed windows; draughtproofing; heat-recovery ventilation; solar and biomass heating; efficient lighting; and solar electric supply. SEA provides training and support to enable owners to open their homes to the public, thus providing real demonstrations of how to achieve significant carbon savings. To date 28 homes belong to the network, and over 36,000 people have visited them. Average carbon savings from the homes are estimated at 70% with a total of about 186 tonnes/year CO₂. Much more carbon has probably been saved as a result of actions taken by visitors. SEA wants to increase the network to 200 homes across the UK so that most people can easily visit one. 20 more homes have been recruited.

Local Authority

Devon County Council

Melanie Sealey

Generating employment by supporting renewable energy businesses and customers

The Renewable Energy for Devon (RE4D) scheme has supported rural regeneration in Devon by stimulating both supply and demand for renewable energy. This has been achieved by producing Technology Growth Plans which evaluate renewable resources and identify opportunities to use them; delivering training and support to installer businesses; and helping SMEs and community organisations install renewable energy technology, by providing advice and grants. The scheme has led to 109 renewable energy installations in SMEs and community organisations (including biomass heating, solar, wind, hydro and heat pumps), and a further 18 in domestic properties, with a total installed capacity of 2.1 MW. These avoid about 1,300 tonnes/year of CO₂ emissions. RE4D has provided £0.25m in grants and helped secure £0.92m of other funding. 55 jobs have been created and a further 16 safeguarded through the scheme.

Kirklees Council

Phil Webber

Rolling out insulation across a large metropolitan borough

In 2007 Kirklees Council committed £9.3m to providing free loft and cavity-wall insulation for every home in the borough where it can be used, and to assessing all households for eligibility for other services. The scheme works efficiently by targeting one council ward at a time, starting by briefing the Councillor and local advertising, then individual home visits by assessors. Suitable households are referred for a survey, then installation of insulation. By April 2009, 115,000 out of the 172,000 households in the borough had been visited, 64,800 referred for surveys, 29,200 surveys completed, and 25,300 households had insulation installed. 40,000 households had also been referred for other assistance. The insulation avoids the emission of an estimated 18,000 tonnes/year CO₂, an amount which will more than double when the whole borough has been covered. 140 jobs have been created by the scheme. The Council will start tackling solid-wall properties when the current scheme is completed in 2010.

School

Ashley Church of England Primary School

Richard Dunne

Antarctic expedition inspires carbon saving at a primary school

Inspired by an expedition to the Antarctic, the headteacher of this 270-pupil school has worked with the whole school community to cut carbon emissions. Pupils read meters, and encourage energy-saving behaviour. High-efficiency fluorescent lights are being installed, and lighting demand has been reduced using solar tubes and occupancy timers. One building has a 35 kW biomass boiler, fuelled using locally-sourced wood. A 4.2 kWp photovoltaic array and 11 kW solar water heater have also been installed to provide electricity and hot water. Sustainable energy is integrated into all curriculum areas. The school has committed to using less than 100 kWh/day of electricity, and pupils are rewarded if this target is achieved. Annual electricity use reduced by an impressive 51% in one year, and continues to decrease. Teachers, governors and families are also challenged to use less than 100 kWh/week in their own homes.

Currie Community High School

Phill Pache

Sustainable energy throughout the curriculum and practice of a Scottish school

This 900-pupil school has a long-standing concern for the environment, and has included sustainable energy measures during regular building maintenance and upgrades for the past ten years. Draught-sealing, efficient lighting, occupancy sensors, and a swimming-pool cover have all reduced energy demand. A feasibility study for renewable energy led to the installation of an 11 kW wind turbine to generate electricity, and a 30 kW solar thermal system to pre-heat water for the swimming pool. Pupils have taken a lead in surveys of electricity use by lighting and other equipment, and in campaigns to reduce use. They have also initiated environmental work in the local community. Interesting aspects of sustainable energy are integrated in different curriculum subjects, including art and design as well as maths and science. Renewable energy is also used with role play and video filming as part of the Currie link with a school in Kenya.