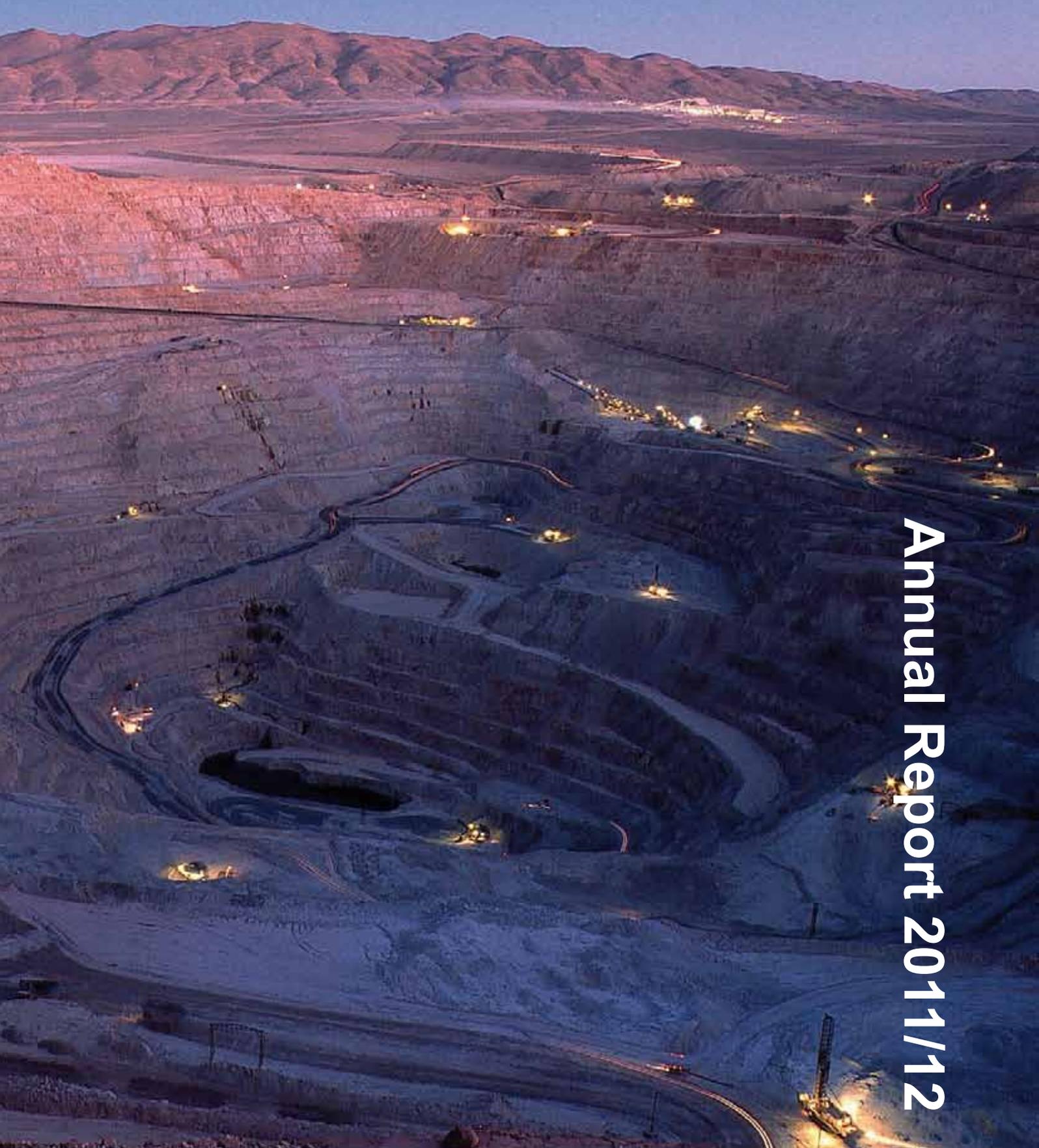


UCL INSTITUTE FOR
SUSTAINABLE RESOURCES



UCL



Annual Report 2011/12

ISR Annual Report 2011/12

Foreword

The UCL Research Strategy sets out an ambitious vision for our university, in which our collective expertise is brought to bear on problems of major significance. Through the UCL Grand Challenges – described on page 7 – the synthesis of our insights from subject-specific research can yield robust, evidence-based and equitable solutions to aspects of these problems.

The judicious management of the Earth's resources is a critical issue for the future wellbeing of humanity, and thus I am delighted by the contribution to this effort made by the UCL Institute for Sustainable Resources in its first year.

UCL ISR embodies our university's commitment to research leadership, to the value added by cross-disciplinary interaction, and to the impact on policy and practice made possible through partnership. UCL values the institute's contribution to its mission, and I look forward to yet more success in its interactions and interventions across and beyond our global university.

Professor David Price
UCL Vice-Provost (Research)



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COVER PHOTO: THE ESCONDIDA MINE, CHILE. SOURCE: BHP BILLITON



Welcome from the director

The UCL Institute for Sustainable Resources (UCL ISR) is an important new addition to UCL's constellation of relatively new environmentally-oriented Institutes, which now also includes the UCL Energy Institute, the UCL Environment Institute and the UCL Centre for Biodiversity and Environment Research. The setting up of these new Institutes reflects UCL's awareness of the pressing need to generate policy-relevant knowledge as to how natural resources and the environment can be used more sustainably.

UCL ISR will focus on research into all the various approaches that can lead to resources being used more efficiently and with less environmental impact, and integrate the resulting knowledge into an enhanced understanding of both the whole concept of sustainability, and of how this can contribute to a greener, more resilient economy.

We will be outward looking: working with the diverse academic communities of UCL and the wider UK university sector that are engaged in resource and environment issues; engaging with businesses that have an interest in sustainable resource use, as befits an institute established through substantial corporate sponsorship; and sharing our insights with policy makers in the UK and internationally.

We will work to enable UCL ISR to become a significant new player in efforts to secure for the future the contributions of the environment and natural resources to human wellbeing. We invite you to join with us to complement our efforts and expertise.

Paul Ekins
Professor of Resources and Environmental Policy
Director, UCL Institute for Sustainable Resources

About the UCL ISR

Established in 2011 with the help of a grant from BHP Billiton Sustainable Communities, the UCL Institute for Sustainable Resources (UCL ISR) is a cross-disciplinary Institute dedicated to generating knowledge to promote the globally sustainable use of natural resources.

'Sustainable resources' is a large and varied subject area and UCL ISR works within a broad definition of both terms.

In terms of resources, the Institute's work includes both finite, such as mineral and petrochemical resources, and renewable resources, such as water and food.

In addition it works with a definition of sustainability that acknowledges the widely accepted importance of the social, environmental and economic implications of resource extraction, use and disposal.

UCL ISR employs its own staff to develop its own research programme but also seeks to act as a forum and coordination mechanism for UCL staff in different departments working on resource and environment issues, transcending the boundaries between academic disciplines.

In this way it will be able to assemble multidisciplinary teams, providing critical mass and capacity for large projects.

UCL ISR is also a centre for doctoral training and research with regard to sustainable resource use. In 2011/12 it established its Doctoral Training Programme in Sustainable Use of Resources and the Environment by awarding its first five PhD studentships, and will add to these in 2012/13.

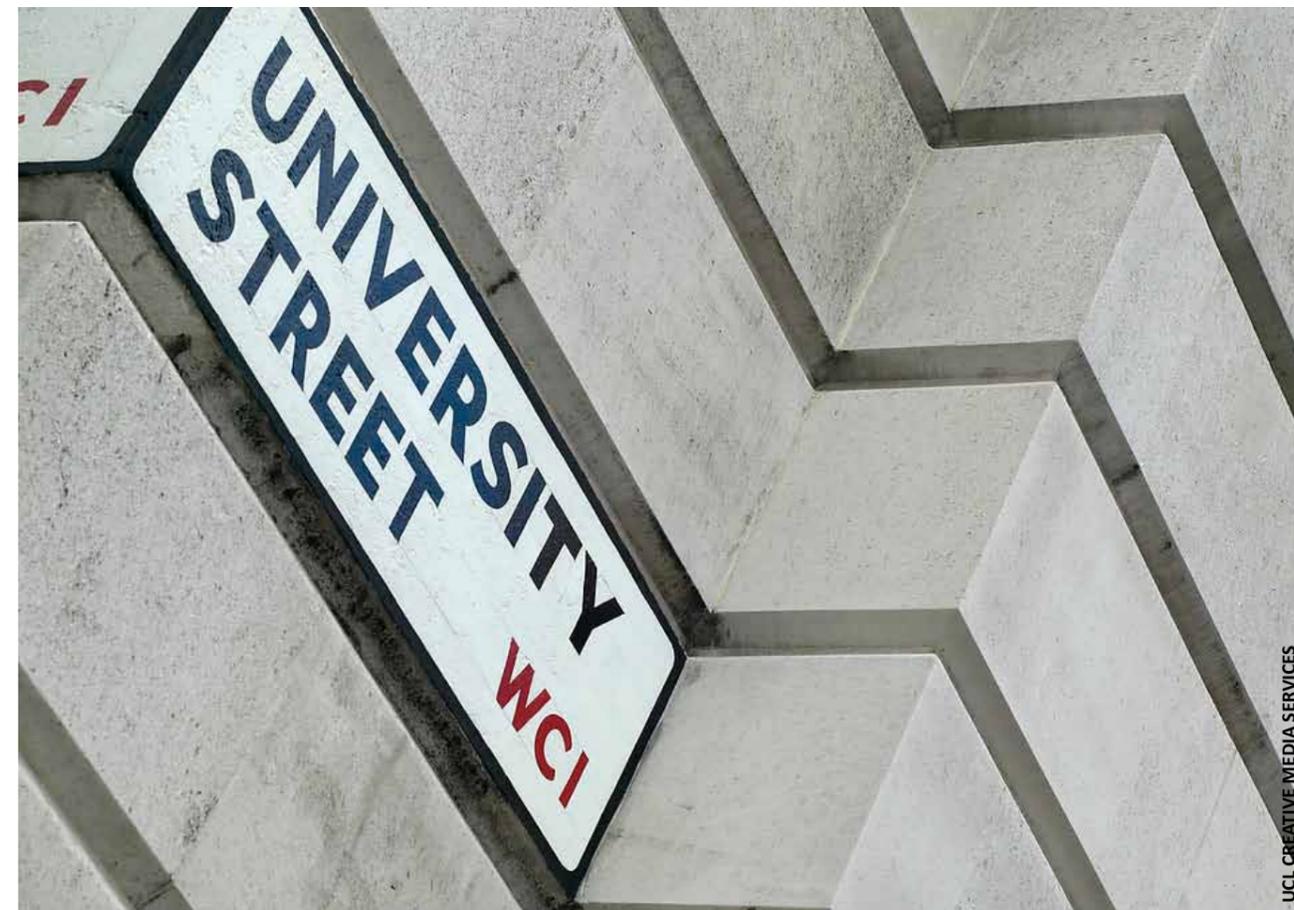
Through the Doctoral Training Programme, UCL ISR seeks to train

the next generation of resource and sustainability experts, who are highly experienced in cross-disciplinary thinking and practices.

Research in this field is fundamentally collaborative and the Institute's third main objective is to engage with partners and stakeholders at a range of levels.

In 2011/12 UCL ISR began this crucial work forging early links with potential industry and government partners, but it is an area that will continue to grow as the institute does.

The Institute events programme will help to facilitate these relationships both within UCL and with our external partners.



UCL CREATIVE MEDIA SERVICES

Appointments

In 2011/12 UCL ISR made its first two critical appointments, the Director and Deputy Director. Together the Director and Deputy Director will develop the Institute's core activities with regard to research, teaching and engagement.

Prof Paul Ekins, Director



Prof Ekins took up the position of director and Professor of Resources and Environmental Policy at UCL ISR in August 2012 and will lead on the Institute's research, teaching and engagement programmes. He was previously Professor of Energy and Environment at the UCL Energy Institute and will continue to work within the UCL Energy Institute.

Paul Ekins' academic work focuses on the conditions and policies for achieving an environmentally sustainable economy, and he is an authority on a number of areas of energy-environment-economy interaction and environmental policy, including: sustainable development assessment methodologies; resource productivity; sustainable energy use; the adjustment of national accounts to take account of environmental impacts; environmental economic instruments and ecological tax reform; sustainable consumption; and environment and trade.

In addition to his position at UCL, he is a Co-Director of the UK Energy Research Centre, in charge of its Energy Systems theme, and also leads UCL's involvement in EPSRC's SUPERGEN Hydrogen and fuel cells Hub.

He is a member of the Expert Panel of the UK National Ecosystem Assessment, of Ofgem's Sustainable Development Advisory Group, of the European Resource Efficiency Platform and of the European Commission's Expert Economists' Group on Resource Efficiency. From 2002-2008 he was a Member of the Royal Commission on Environmental Pollution. He also has extensive experience consulting for business, government and international organisations, and has contributed to His Royal Highness the Prince of Wales' annual course for senior executives on business and the environment at the University of Cambridge, and the Cambridge Programme for Sustainability Leadership.

In 1994 Paul Ekins received the Global 500 Award 'for outstanding environmental achievement' from the United Nations Environment Programme.

Katherine Welch, Deputy Director

Katherine Welch joined UCL ISR as Deputy Director in January 2012. She will work closely with the Institute's Director to coordinate its research, doctoral training and business engagement.

She will also be responsible for establishing much of the UCL ISR's events programme and marketing outputs.

Katherine has an experienced background in communications and project development, having previously worked as an editor and

conference director at business-to-business publications Mining Journal and Mining, People and the Environment. In these roles she worked extensively across the mining sector on a range of environmental and sustainability issues from pollution and waste management to resource governance and corporate social responsibility.

Katherine has also worked with a wide range of resource professionals, creating a range of collaborative opportunities for UCL ISR.

Katherine is an Earth Science graduate with a BSc in Geology and MSc in Quaternary Science.



In 2012/13 UCL ISR will make a number of additional appointments to strengthen its academic team, including but not limited to:

- BHP Billiton Chair in Sustainable Global Resources
- Senior Lecturer or Lecturer in Resource and Environmental Economics
- Research Associates to support the Institute's research programme

Partnerships

As a prominent multidisciplinary research institute, the UCL Institute for Sustainable Resources recognises the importance of wider dissemination of its research with emphasis on innovation and knowledge transfer.

In 2011/12, UCL ISR developed its working relationship with its founding sponsor BHP Billiton Sustainable Communities, meeting with the company on a regular basis to provide an update on progress to date and development plans in progress.

During the year UCL ISR also began to engage with a range of industry and government representatives as it seeks to partner with the full range of relevant stakeholders, and through such collaborations to enhance strategic engagement with resources policy and government debate, develop a leading role in international energy affairs and stimulate new research and development in the resources sector.

BHP Billiton Sustainable Communities – founding sponsor

BHP Billiton Sustainable Communities is the founding sponsor of the UCL Institute for Sustainable Resources. BHP Billiton is the world's largest mining and diversified resources company with approximately 100,000 employees in more than 100 operations in over 25 countries.

The company has supported the development of UCL ISR through BHP Billiton Sustainable Communities, a charity established by the company as part of its community investment programme, which has a target to commit 1% of pre-tax profit (three year rolling average) to community programmes in markets where it has a business interest.

BHP Billiton Sustainable Communities has provided UCL ISR with US\$5 million over a five year period to fund academic research,



BHP BILLITON

fellowships and scholarships, as well as the appointment of a new Chair in Sustainable Global Resources.

The use of this funding is at the discretion of UCL ISR and is not influenced by or a reflection of BHP Billiton's business practice.

In addition, BHP Billiton and UCL ISR may also wish to collaborate on separate

research projects, independently of the existing funding arrangement.

BHP Billiton and UCL ISR will also continue to grow the existing relationship through development opportunities including industry placements for students, sabbaticals for UCL academic staff and research project opportunities for BHP Billiton employees.

Message from BHP Billiton

At BHP Billiton, we are constantly striving for better ways of conducting our business and it is in this pursuit of excellence that we formed a partnership with University College London, investing US\$10 million over five years in the Institute for Sustainable Resources in London and the International Energy Policy Institute in Adelaide, Australia. The mining of minerals and the extraction of hydrocarbons from the earth is clearly a non-renewable process so it is not only necessary but desirable to foster new ways of addressing the growing demand for the essential raw materials for everyday use as well as those commodities which will help reduce global carbon emissions. Our most important asset is our people, so we are pleased to support a forum where skills can be developed which will help talented and passionate people achieve scientific and technological breakthroughs that will improve our industry's contribution to a sustainable future.

Dr Andrew Mackenzie
Chief Executive, Non-Ferrous

Outlook - 2012/13 Engagement

Business Engagement Board

UCL ISR particularly recognises the role of business and industry and in 2012/13 will create a business engagement board comprising key representatives from a range of sectors relating to sustainable resource use. The board will meet on a regular basis to discuss areas of academic interest as well as collaboration and sponsorship opportunities.

Academic Engagement Group

In addition to its Business Engagement Board, in 2012/13 UCL ISR will create an Academic Engagement Group comprising representatives from a range of faculties across UCL whose work relates to resources and sustainability.

The academic group will also meet on a regular basis to discuss opportunities for project development, collaboration and dissemination.

ISR across UCL

The UCL Institute for Sustainable Resources is one of a number of cross-disciplinary institutes at UCL, which in addition to developing its core research programme, acts as an umbrella institute facilitating collaboration between UCL's academic departments and units.

Stimulating such collaborations will be an important part of UCL ISR's work and in 2011/12 the Institute began to develop critical relationships with its partners across the university, from individual academics and small research groups, to other multidisciplinary Institutes such as the Environment Institute and Energy Institute.

In addition to collaborations across the UK campus, in 2011/12 the UCL

ISR developed a strong relationship with the UCL School of Energy and Resources in Adelaide, Australia.

In particular the UCL Institute for Sustainable Resources will develop a partnership with the International Energy Policy Institute, based in Adelaide, which has also been established through a founding donation from BHP Billiton Sustainable Communities.

In 2012/13 UCL ISR will continue to develop its relationship with UCL Australia, facilitating opportunities for staff and students to travel between campuses, co-supervision

of doctoral students and collaborative research projects.

Over 2012/13 UCL ISR Director, Prof. Paul Ekins, will also be Chair of the first UCL Policy Commission, the UCL Policy Commission on a Green Economy.

Through these relationship UCL ISR will form part of an international institutional and research framework for developing innovative responses to the complex economic, legal, environmental, technological and cultural issues facing the resources sector.

Working with the Grand Challenges

UCL ISR's research also has a direct relationship with the UCL Grand Challenges, which aim to address issues of global concern.

Resources and Global Health

Access to resources has a profound impact on global health. Loss of biodiversity and pollution from resource extraction can have a negative impact on human health while access to resources, in particular clean water, could substantially reduce disease, malnutrition and poverty-related mortalities.

Resources and Sustainable Cities

With more than 50% of the global population now living in urban areas, the number of cities of more than one million inhabitants is set to continue to grow. This will place continuing pressure on both land use and resources.

Resources and Intercultural Interaction

Resources from water and food to energy and building materials are critical to social development and economic growth. The development of a 'green economy' aims to simultaneously address resource and economic stress as well as social cohesion.

Resources and Human Wellbeing

An estimated 925 million people currently live in poverty. More equitable and sustainable management of resources including food and water could profoundly reduce currently levels of poverty as well as supporting the additional 2 billion people expected by 2050.



Research Programme

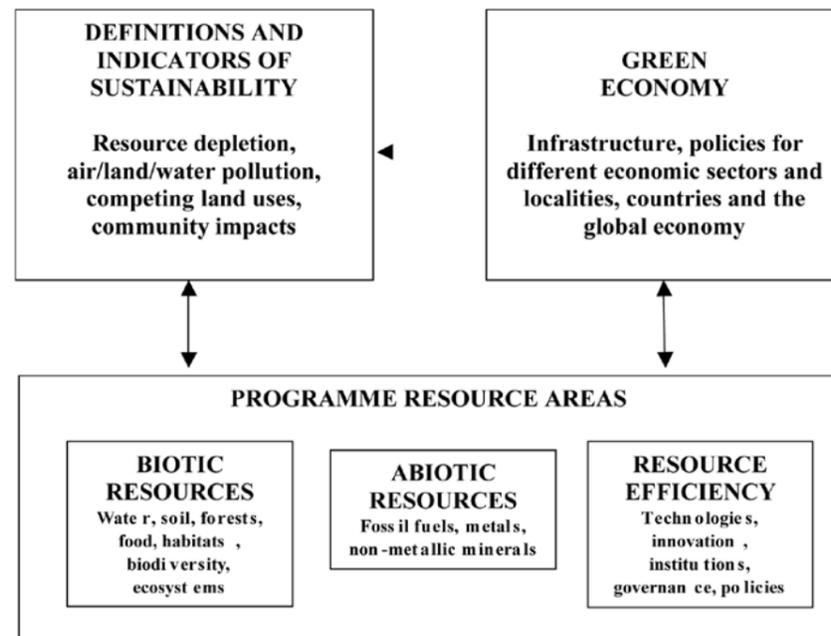
UCL recognises that achieving strategic priorities and dealing with future challenges depends on a willingness to address pressing and complex global issues, including long-term sustainability, responsible management of resources, social responsibility and community engagement, environmental protection and enhancing wellbeing.

In 2011/12 the UCL Institute for Sustainable Resources began developing a research programme that will deliver high-quality research in fields including energy, waste, environmental engineering, climate change, corporate responsibility, international law and development in the Global South.

UCL ISR will build its on capacity to carry out in-house research in the areas of its research themes but will also seek to pull together the research capabilities in these areas from across UCL.

UCL ISR's research programme is being developed around five key themes:

- **Abiotic resources**
- **Biotic resources**
- **Resource efficiency**
- **Sustainability indicators**
- **Green economy**



Abiotic resources

The abiotic research theme will include research relating to fossil fuels, energy and mineral resources.

Research in this area will build on work currently undertaken at the UCL Energy Institute, which has developed an energy system model (TIAM-UCL) with a unique and detailed description of global fossil

fuel resources. This resource-related part of the work will be transferred to UCL ISR.

In addition, UCL ISR will carry out a major new programme of activity to include the material component of the energy system in the existing TIAM-UCL model, focusing especially on bulk minerals such as iron and steel, and scarce or potentially scarce resources such as rare earth elements and water.

Biotic resources

Research areas in this theme will include the full range of biological resources including water, soil, forests, biodiversity, food, habitats and ecosystem services.

This area of research will include ongoing work on bioenergy, seeking to understand and model the sustainable extent of its role in the global energy system.

Another major new area of research is expected to be the integration of knowledge from studies such as



FRASER SIMPSON, UCL GENETICS, EVOLUTION AND ENVIRONMENT

The Economics of Ecosystems and Biodiversity (TEEB), the Millennium Ecosystem Assessment (MEA), and the UK National Ecosystem Assessment, to generate new understanding of the economic role of these resources and how to represent their contribution to the economy in economic models, such as that in UNEP's Green Economy Report.

Resource efficiency

This theme will focus on research relating to the technologies, innovation, institutions, governance processes and policies that promote the sustainable use of resources.

This is a major area of existing research (see existing projects), which will continue under UCL ISR.

Sustainability indicators

The consideration of our understanding of the term sustainability and how it is defined is central to the ethos of UCL ISR.

This theme will include research into issues of resource depletion, pollution and other environmental impacts, competing land use, and the impact of resource extraction, use and disposal on the environment and its ecosystem services.

The theme will also include research into the social aspects of resource use.



UCL CREATIVE MEDIA SERVICES



UCL CREATIVE MEDIA SERVICES

Again this is an area of existing work that will be transferred across to UCL ISR, providing immediate areas of research focus.

In addition, early areas of research will include developing an operational index of the 'sustainability gap': the distance between current environmental and resource outcomes and those that might be characterised as environmentally sustainable; and exploring the possible nature, institutional and legal structure, and financial arrangements of international Sustainable Commodity Agreements, which would seek to ensure that both abiotic and biotic resources were produced in a way that was financially viable as well as environmentally sustainable.

Finally UCL will collaborate with other departments at UCL, in particular Earth Science and Geography, to develop ways of improving the communication of climate science in particular, and sustainability science in general, to increase the understanding of policy makers and the public of the challenges faced in these areas.

Green Economy

This theme will integrate the resource programme areas with different economic models and perspectives at different levels: global, national and local. It will consider what infrastructure and policies are necessary to promote a greening of different economic sectors and localities, country economies and the global economy.

Research in this area will largely involve bringing together the various individual studies at UCL ISR, and data and research approaches from elsewhere, to construct an energy-environment-economy model that is better able to take account of the economic contribution of resources and the environment than most current models.

Other projects in these research areas will be developed according to the interests and capabilities of relevant and interested researchers across UCL.

Current Research Projects

FP7 European research projects

UCL-ISR has won three FP7 research projects, which will continue over the next three years.

Environmental Macro-Indicators of Innovation (EMInInn)

EMInInn will assess the environmental impacts associated with innovation. It will assemble and set out coherently both macro-indicators and data of environmental impacts and indicators and data to measure innovations. It will apply a number of analytical approaches for the assessment of the macro-environmental impacts of innovation to energy sources and conversion technologies, information and communication technologies, transport, built environment and buildings and waste management. By improving methods of environmental assessment of innovation, EMInInn seeks to contribute to the flagship initiatives for a Resource Efficient Europe and the Innovation Union and improved EU-policies for a transition towards a more sustainable Europe.

Choosing Efficient Combinations of Policy Instruments for Low-carbon development and Innovation to Achieve Europe's 2050 climate targets (CECILIA2050)

The CECILIA2050 project will undertake the qualitative and quantitative assessments necessary for designing an optimal policy instrument mix for achieving the necessary GHG emissions reductions by 2030 to put the EU on a pathway towards a low-carbon economy by mid-century, with emissions at least 80 per cent below 1990 levels. CECILIA2050 will first assess the existing European climate policy instrument mix to understand its effects and limitations, and will then establish GHG emissions reduction scenarios for 2030–2050, in line with the EU's carbon emissions reduction goals, and develop instrument scenarios for meeting these goals. It will then define pathways for moving towards an optimal instrument mix and finally recommend options for policy makers to help achieve EU climate policy objectives

Policy Options for a Resource-Efficient Economy (POLFREE)

UCL ISR is leading this six-institute project, which will construct a theoretical framework for the analysis of resource efficiency, with detailed comparison of the trends and policies at EU and Member State level, and an analysis of business barriers to resource efficiency, thereby developing an enhanced understanding of the drivers of inefficient resource use. This will lead to an exploration of new concepts and paradigms that can bring about a radical increase in resource efficiency, and a vision for a resource-efficient economy in the EU, with suggestions also for new more resource-efficient business models for firms, and ideas for a global governance regime that can promote resource-efficient economies among the EU's trading partners and more widely will be explored. From its new vision for a resource-efficient Europe, the project will propose new policy mixes, business models and mechanisms of global governance through which resource-efficient economies may be promoted.

UCL Laws

UCL ISR is funding the work of Chiara Armeni, a Research Associate in the UCL Laws faculty. Chiara's main research interests lie in international and European environmental law, with special focus on Carbon Capture and Storage (CCS) and the law and policy of climate change. Further research interests include international energy law, and the relationship between environmental law and human rights. As part of her work for the UCL ISR, Chiara will continue her research in the area of carbon capture and storage as well as research into current EU strategy on raw materials via the Raw Materials Initiative



Doctoral Training Programme



In 2011/12 UCL ISR established its Doctoral Training Programme in the Sustainable Use of Resources & the Environment (SURE) to support its complex and interdisciplinary research objectives.

Our students work alongside experienced researchers both within the Institute and across other UCL faculties to gain the best possible training in issues relating to resource use.

UCL ISR students follow a four-year programme comprising a one-year MRes and three-year MPhil/PhD.

In 2011/12 UCL ISR awarded its first five BHP Billiton Sustainable Communities-sponsored studentships as part of its SURE training programme. The projects are hosted across a variety of departments from Archaeology to Earth Science and the range of studies to receive awards reflects the breadth of the Institute's research programme.

In 2012/13 UCL ISR will look to begin development of its own MRes programme with the aim of offering it in 2014.

The one-year MRes will combine an intensive taught course programme, offering a range of suitable courses

from relevant UCL faculties, with an independent research project drawing on the student's area of interest as well as UCL ISR's core research themes.

The course will be designed to provide students with the necessary grounding to progress to an MPhil/PhD programme in which they can further develop their chosen area of study. It also provides students with transferable skills including writing, presenting and communicating with the public as well as training in quantitative research methodologies.

The MPhil/PhD allows students to continue to develop their chosen field of study through the production of an original piece of research representing a distinct and significant contribution to the subject, whether through the discovery of new knowledge, the connection of previously unrelated facts, the development of new theory, or the revision of older views.

Students have the opportunity to work closely with academic supervisors from across UCL drawing on a wide range of expertise relating to the sustainable use of resources.

2012 PhD Projects

Lessons in Sustainable Waste Management From An Ancient Maya Salt Production Centre In Belize

Supervisors: Prof. Elizabeth Graham, UCL Institute of Archaeology
Dr. Julia Stegemann, UCL Civil, Environmental and Geomatic Engineering

This project will study the association between intensive salt production, short-term environmental degradation, and long-term enhancements in cultivability, biodiversity and shoreline stability at a site of Mayan salt production on Ambergris Caye, an island off the coast of northern Belize.

The project hypothesises that there were a series of serendipitous positive interactions between the local environment and the by-products and impacts of uncontrolled salt resource exploitation.

The project also aims to create a better understanding of these interactions, which can inform modern resource management practice and policy, particularly in relation to waste management, soil carbon sequestration, and land use and remediation.

Recovery of Nutrients from Wastewater for Sustainable Fertiliser Production

Supervisor: Dr. Luiza Campos
UCL Civil, Environmental and Geomatic Engineering

This project will explore the potential for nutrients in human waste to be developed as an alternative source of fertiliser nutrients as traditional sources are energy intensive and face potential supply constraints.

The project proposes that recovering these nutrients from wastewater would have environmental benefits, reducing the requirements for artificial fertilisers and eutrophication

Outlook - 2013/14 Studentships

of water bodies due to discharge of wastewater containing excessive nutrient loads, as well as providing potential for cost saving in the wastewater treatment process.

Furthermore, nutrients recovery can reduce greenhouse gas (GHG) emissions due to a lower amount of sludge produced in treatment plants.

Energy Efficiency barriers in Africa's copper industry

Supervisor: Dr. Neil Strachan, UCL Energy Institute

This project seeks to identify the key barriers to improving energy efficiency across sub-Saharan Africa, with the aim of better informing political decision making to reduce energy dependency and promote sustainable development.

The project will focus on a study of the Zambian copper sector as both a major economic sector, accounting for 70% of foreign exchanges, but also a large energy consumer, using 55% and 37% of the total electricity and oil consumed in the country respectively.

In addition, although an important and major non-ferrous metal in sub-Saharan Africa, there has been little economic-energy-environmental research into energy efficiencies in the copper sector

despite being energy and carbon intensive.

Therefore, this research will endeavour to bring more understanding on the state of energy use in Africa's copper industry, and also develop a model that can be used to aid energy-related policy decision making processes.

Sustainability of 'manufactured water': Comparative political ecology of desalination plants in London (UK) and Chennai (India)

Supervisors: Dr. Sarah Bell, UCL Civil, Environmental and Geomatic Engineering
Dr. Pushpa Arabindoo, UCL Geography

This project will investigate the similarities and differences in policies between the global North and South, by comparing the cases of two desalination plants.

The objective of the research is to fill this research gap using the London and Chennai cases to explore how sustainability discourses in the global North and global South converged and diverged as arguments were framed in favour of and against desalination plants.

Despite the controversies surrounding a growing reliance on desalination plants, there have been

few systematic efforts at studying this phenomenon.

In order to unravel the sustainability discourses associated with desalination plants and the prospects of 'manufacturing water' in the global North and global South, this project will, first of all, examine the politics behind how the desalination plant in the two cities was sited, constructed and operated amidst concerns of mitigating their environmental impacts.

Towards sustainable and risk free gas production from an unconventional source

Supervisors: Prof Juergen Thurow, UCL Earth Sciences)
Prof Philip Meredith, UCL Earth Sciences
Dr Neal Skipper, London Centre for Nanotechnology,

This project addresses one of the most controversial and publically debated energy sources in use today, shale gas.

Despite being predicted to be the largest contributor to growth in natural gas production in many countries around the world over the next several decades, there are a number of problems and controversies around abilities to produce shale gas in a sustainable and environmentally acceptable manner.

This project will investigate some of the critical issues around securing safe supplies of shale gas by developing experimental methods and models to understand how basin-wide changes in sediment properties, composition, organic maturity and mechanical resistance to fracture propagation control both the response of the shale reservoir rocks to the stresses imposed by the fracking process and the resulting gas flow. The project will also address societal concerns particularly around risk reduction.

UCL ISR will be offering four BHP Billiton Sustainable Communities -sponsored studentships in 2012 to begin in the 2013/14 academic year:

Estimating the Sustainability Gap

The research will identify thresholds of sustainable use for resources and the environment, at the appropriate geographical and spatial level, and estimate both the gap between these thresholds and current uses of resources and environment, and the expenditure on technologies that would be required to close the gap.

Modelling Material Use in the Global Energy System

The research will add to the UCL

Energy Institute's TIAM-UCL global energy system model by calculating the flows of material (not energy) resources through the energy system required in order to build or operate the equipment that generates, converts, transports or uses the energy, in order to get a more complete understanding of the full resource demands of producing and consuming energy.

Modelling the Green Economy

This research will represent the environment and resources as 'natural capital', alongside other factors of production, in a macroeconomic model, in order to develop a tool that will give insights

into the macroeconomic implications both of investments in resource efficiency, greenhouse gas emissions reduction and environmental protection, and of failure to make such investments

The Prospects for Sustainable Commodity Agreements

The production of many commodities currently has substantial negative environmental impacts. This research will explore the financial and legal mechanisms that could allow these impacts to be substantially reduced through the negotiation of sustainable commodity agreements.

Outlook - 2012/13 Student Activities

It is important to UCL ISR that its students are able to grow as a cohort, particularly as they may be working in a range of departments across UCL and on widely varying research topics.

The Institute therefore offers a range of additional activities and support services for its students designed to encourage students to work together as a unit as well as further their understanding of global sustainable resource use beyond their specific area of research.

The student activity programme also provides UCL ISR students with a range of transferable skills including writing in a range of formats, utilising social media and public speaking.

Sustainability discussion group

As part of their sponsorship UCL ISR students are required to take part in a fortnightly discussion group developing a range of themes relating to global sustainable resource use.

The discussion group is particularly relevant for students during the first year of their programme, complementing individual courses taken during the MRes.

Each 60-90 minute session will be built around predetermined material drawn from academic papers, reports, conference proceedings, or media articles with the students being encouraged to discuss a range of topics and issues beyond their immediate studies. The students will also be encouraged to identify future topics for the discussion group and to lead at least one of the sessions each term.

Student blog

Students are also encouraged to take their discussions beyond the classroom by contributing to the ISR blog, twitter feed and other media. Students are required to contribute one blog post, on a topic of their choice, each term.

The ISR blog provides a space in which students can further investigate ideas developed during the discussion group as well as write about their research projects or events they have attended, developing alternative communication skills.

Student organised events

In addition to scheduled activities UCL ISR supports its students in organising

their own events programme from breakfast or lunchtime seminars to workshops with industry experts.

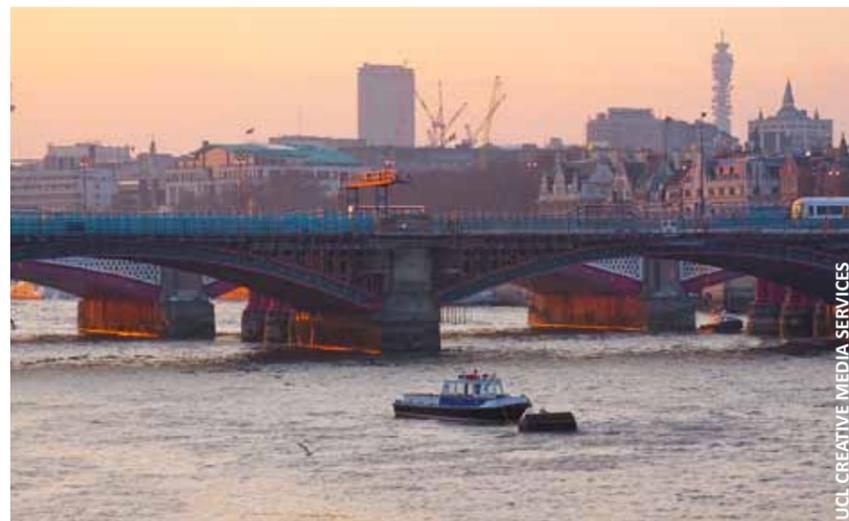
Careers in Sustainability and Natural Resources

UCL ISR also supports students across UCL who are interested in further study or careers relating to sustainability and natural resources.

Beginning in 2013 UCL ISR, together with the UCL Careers Service will offer a workshop for all final year undergraduate and post-graduate students at UCL looking at career options in natural resources and sustainability.

The interactive workshop gives students the opportunity to network with sustainability and resource professionals, and hear about open graduate recruitment programmes and other world-class professional development opportunities.

The workshop also allows companies with active recruitment programmes to meet some UCL's most talented final-year students.



Outlook - 2012/13 Event Series



BHP Billiton Sustainable Communities-Grand Challenge Symposium

The annual BHP Billiton Sustainable Communities—UCL Grand Challenges Symposium series brings together key academics, industrialists, government figures, policymakers and other stakeholder to explore issues relating to sustainability, the environment, resources, responsible planning, human rights and other topics.

The series will begin in 2012 with a multi-stakeholder seminar titled 'Closing the gap: Aligning strategies towards sustainable resource use'.

The seminar will bring together a panel of leading figures from industry, government, academia and civil society with around 30 senior delegates to discuss the role each sector will play in the future sustainable use of the Earth's resources.

In future years each of the symposium will be closely aligned with one of the UCL Grand Challenges, exploring in more depth the relationship between resources and global health, sustainable cities, intercultural interaction and human wellbeing.

Public Lecture Series

In 2012/13 UCL ISR will present its first public lecture series. The series will include lectures by leading experts on a diverse range of topics, free of charge and open to the public. In addition UCL ISR will hold seminars, workshops and other activities to further its engagement with UCL and external stakeholders.

Other Activities

In addition to its own scheduled activities, UCL ISR will collaborate on joint activities programmes and shared events with other cross-disciplinary institutes and the UCL Grand Challenges on themes relating to sustainability and resource use.

In particular UCL ISR will work closely with its partner institutes the Energy Institute and the International Energy Policy Institute.

Resources: Framed Photo Competition

In 2012/13 UCL ISR will launch its Resources:Framed photo competition open to all UCL staff and students.

In its first year the competition will be based around the theme 'natural resources in a human world' and will be judged by renowned photographer and director of the Hard Rain Project, Mark Edwards. More information on the project is available on the UCL ISR website.



Marketing

The UCL Institute for Sustainable Resources also takes full advantage of traditional and social media to engage with its stakeholders and in 2011/12 began a public engagement programme including website, twitter feed, blog and newsletter.



Sustainability Across UCL

As one of the world's leading universities, UCL is committed not only to its environmental research and teaching but to reducing its environmental impact as a major institution.

UCL is realising this commitment through the Environmental Sustainability Steering Group, a forum for key stakeholders to meet, review and agree key environmental initiatives.

UCL has committed to a number of targets to improve its environmental performance including reducing its carbon emissions by 10 per cent per

year as part of the 10:10 challenge and recycling 75 per cent of its office-based waste by 2013.

UCL is participating in the Higher Education Carbon Management Programme of the Carbon Trust and twenty two projects have been identified which will engage both students and staff in the important challenge of reducing carbon emissions.

In addition UCL is committed to supporting sustainability across its procurement, supporting schemes such as Fairtrade.



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