



## Programme Overview

The MSc provides students with a firm understanding of the main issues encountered in the sourcing, transport and use of energy and resources for the development of a sustainable economy. The programme is two years in duration if undertaken full-time, and part-time study is also available (for Australian students only).

For full-time students, the first year of the programme comprises the completion of eight modules. The second year sees students undertake a unique nine month industry placement, in collaboration with an industry or government or university partner. It will enable students to gain significant in-depth experience of the sector through undertaking a project which is assessed by a dissertation.

## Who should undertake the programme?

The MSc in Energy and Resources: Policy and Practice is designed for recent graduates seeking to work in the sector and those who have been in the workplace for some time and are now are looking to change the focus of their career or to change sector. The MSc aims to prepare students for careers with a focus on policy development, strategy and planning in corporations operating in the energy or resources sectors or in government departments whose remit covers these sectors.

## Programme Outcomes

On completion of the programme, successful students will have:

- ▶ a depth and breadth of technical and practical skills and up-to-date energy and resources sector knowledge;
- ▶ completed a unique and substantial project during a placement with a relevant industrial or governmental partner;
- ▶ skills to enable them to develop their careers in the energy and resources sector with a particular emphasis upon policy, strategy and planning; and
- ▶ an internationally-recognised Masters qualification from one of the world's foremost universities.

## Programme Structure for Full-Time Students

### Year 1, Semester 1:

1. Economics for Energy, Resources and the Environment
2. Law for Energy and Resources
3. Resources Development and Sustainable Management
4. Energy Technology Perspectives

### Year 1, Semester 2:

1. Geopolitics of Energy and Resources
2. Energy Efficiency and Conservation
3. Project Management
4. Climate Modelling and Policy

### Year 2

Full-time students complete their project and dissertation during a nine month placement.

## Programme Structure for Part-Time Students

(Note: Part time status is not available for international students)

Part-time students would normally complete either

- A. Two of the above modules per semester for two years, with the project and dissertation being undertaken in the third year;
- or
- B. One of the above modules per semester for four years, with the project and dissertation being undertaken in the fifth year.

## Programme Entry Requirements

A minimum of a Second Class (Lower Division) Australian or UK Bachelor honours degree, or an Australian four-year Bachelor's undergraduate degree awarded with Honours and an overall grade of B. The degree should be in an appropriate discipline (for example, engineering, information technology, economics, science, physics, geography, law or business studies).

Alternatively, an Australian undergraduate degree plus substantial work experience in a relevant industry or government sector (for example, energy and resource companies, policy organisations, regulatory bodies). Equivalent international qualifications are also acceptable.

## Programme Fees

UCL charges a tuition fee which covers registration, tuition and supervision for each academic year or part of an academic year that a student is enrolled. The fees for programmes commencing in 2010 at UCL SERAus are as follows:

### MSc in Energy and Resources

- Full-Time Study: AU\$32,250 per annum (two-year programme)  
Part-Time Study: AU\$32,250 paid over two or four years, plus AU\$32,250 for the final year project

## Scholarships

UCL is offering up to ten Santos Scholarships for full time places on the MSc of Energy and Resources: Policy and Practice, commencing in 2010. The Scholarships incorporate the following:

- ▶ Full cost of tuition fees - A\$64,500
- ▶ A stipend of A\$25,000 each year for 2 years
- ▶ Awards will be made prior to 30th November 2009
- ▶ Start date of 22nd February 2010

The Santos Scholarships are open to all students (Australian and international) who have been issued with and accepted an offer of admission (conditional or unconditional).

## To apply for a place on the course

Visit [www.ucl.ac.uk/australia](http://www.ucl.ac.uk/australia) and complete the online application form.

## Programme Content

The taught component of the MSc in Energy and Resources: Policy and Practice comprises eight modules, which are undertaken in the first year for full-time students, and over two or four years by part-time students. Each module is delivered in “intensive mode”, with the module being delivered over five consecutive days, with a two-hour written examination immediately following. For each module, a student also undertakes a project, leading to a report which is submitted no later than three weeks from the final day of tuition. The project and subsequent report may be undertaken off campus, thus enabling “fly-in”; “fly-out” attendance for part-time students.

**A summary of each of the eight modules is provided below.**

### Economics Of Energy, Resources And The Environment

This module provides a broad understanding of the fundamental principles of the economics of natural resources, the concept of external impacts of resource use and methodologies for supporting “the polluter pays principle”; how a value is placed upon environmental damage and the potential hazards of doing so in the concept of intergenerational equity. The functioning of primary and secondary energy markets will be analysed, with particular emphasis on factors impacting on the world oil market and their wider economic and environmental ramifications. The logic underpinning a carbon emissions reduction scheme, the creation of a market for carbon, and how a liable entity operates as a market participant will be examined and the implications for generating electricity in a carbon constrained world assessed.

### Law for Energy and Resources

This module examines the legal regulation of energy actors and activities, principally from an international perspective. It also provides a synopsis of the international framework before examining the key concepts in international energy law; permanent sovereignty over natural resources and the principle of sustainable development. This course also traces the development of legislation with reference to exploration, extraction and the enforcement of mining and petroleum interests. Community and social issues are discussed, including the relationship between mining and indigenous people, environmental controls over mining production, and the corporate social responsibility of companies operating overseas, including the links between resource exploitation, the environment and human rights. Finally, legislation to establish an emissions trading regime in Australia, mandatory renewable energy targets, and the emerging legal regulatory framework for carbon capture and storage are covered.

### Resource Development and Sustainable Management

This module examines the integration of resource development and management for facilitating sustainable development. It covers the key concepts and techniques for the development and implementation of environmentally benign energy resources, approaches for incorporating adaption to climate change into the management of natural resources, and knowledge based decision support systems for sustainable resources development and management. This module also examines the changing nature of human interaction with the environment; examine current conservation policies, strategies and issues; and looks at the involvement and response of commercial, industrial and public sectors to environmental issues.

### Energy Technology Perspectives

To meet the ever increasing energy demand which is required for sustainable economic growth, an appropriate integration of various environmentally benign energy technologies and fuels is required. This module addresses the different aspects which need to be investigated, such as the potential impact of embedded distributed generation on power systems, the integration of different types of technologies into the energy “mix”, including renewable energy technologies, nuclear power, and hydrogen, and the more radical and fundamental changes that will be required to meet stringent emission reduction requirements by 2050.

### **Geopolitics of Energy and Resources**

This module analyses the complex relationship between energy provision and politics in a global perspective. It involves consideration of aspects such as environmental politics, energy security, complex global energy and resource dependency relations, research and technology development, and international political objectives. An important focus is on how energy endowments have shaped the nature of certain countries and the extent to which they interact with the world. Further, the course examines ways in which producer countries have used oil and gas, or their proceeds, as an instrument or means of national power. In the context of producer countries, the course looks at the satisfaction of energy needs as an end or goal of various foreign policy or security strategies, such as the militarization of energy, oil diplomacy, pipeline politics, or energy mercantilism. Finally, the consequences of the future geopolitical landscape in light of a shift away from fossil fuels are considered.

### **Energy Efficiency and Conservation**

The aim of this module is to address key concepts and methods for energy efficiency and conservation. Different types of energy efficiency improvements and conservation methods are analysed. This module focuses on innovations emerging from contemporary research output especially in energy management and control, reducing energy demand, and the implications of energy supply-demand interaction for pathways to a low-carbon economy. The practical implications of energy efficiency regulations, system behaviour and economics are interspersed with engineering and theoretical aspects. The impacts of transport are also covered, together with opportunities to reduce transport energy requirements through more efficient engines, public transport, and urban design. Industrial systems examined include heat recovery; cogeneration; compressed air and steam distribution; and motor systems, pumps and fans. Various government policy measures are also covered in terms of their effectiveness and relevance in Australia. Finally, barriers to improved energy efficiency such as up-front cost, lack of information, and the low cost of energy in Australia are examined.

### **Project Management**

This module addresses project management techniques with a strong emphasis on a systems-based approach to project management. It provides in-depth knowledge of project design, analysis, cost and resource optimisation, interaction between market competitors patterns of technological and market change, and integration of energy and environment management. Topics also include project life cycle analysis, work breakdown structure and Gantt charts, network diagrams, scheduling techniques, and resource allocation decisions.

### **Climate Modelling and Policy**

This module provides an understanding of the dynamics of the climate system in the context of anthropological emissions of greenhouse gases. It covers climate change and its impacts on decision support tools in policy making. In this course, the climate models that integrate physical and chemical processes are analysed to provide insights into opportunities for mitigating and adapting climate change. The methodology underlying the construction of global economic/environmental models are examined and their policy implications analysed in the context of the Stern Report, Australia's Carbon Pollution Reduction Scheme White Paper, and subsequent critical analyses.