



## The Energy Trilemma



**GD311**

**Module Leader Dr Jonathan Clarke**

**Option - Final year only for GSD courses**

**Term 2**

**15 CATS**

**10 x 2 hour seminars**

**4 lecture hours**

*Not available to students outside  
GSD*

**Please note: The information on this page relates to the 2020-21 academic year.**

### Principal Aims

Global energy markets are in a period of dramatic transition. The emergence of shale gas, mostly notably in the US, has been disruptive to the industry, leading to falling oil prices. This has challenged the long-time dominant position of international oil companies (e.g. BP, Shell, ExxonMobil) in the petroleum sector. Natural gas has emerged as a potentially important 'bridging fuel' to a low carbon future, with several leading national economies, including China, making the switch from carbon-intensive oil and coal to this 'lower-carbon' alternative. Away from oil and gas, renewable energy sources are becoming increasingly cost competitive and are gaining societal and governmental support.

The energy transition alters the global dynamics of energy security, with some countries finding their energy independence challenged, whilst others enjoy the economic growth that is inherently linked to energy abundance. A similar distinction can be made between populations with regards to energy equity: the

accessibility and affordability of energy, and as with energy security this too is in a state of flux due to changing market conditions. These three dimensions – sustainability, energy security and energy equity constitute an ‘energy trilemma’; the focus of this module.

The module addresses the challenges posed by the trilemma to national, regional and local economies, and in developing, emerging and developed economic contexts. In addition to the trilemma’s aforementioned dimensions, the module will also consider concerns of energy efficiency, ‘green growth’, sustainable energy governance and cooperation, and technology and infrastructure. In this regard, the module will broaden the student’s knowledge and understanding of the key issues around the UN’s Sustainable Development Goal 7.

## Principal Learning Outcomes

Upon completion of the module, students will be able to:

- Identify the leading issues around energy security, equity and sustainability across different economic and geographical contexts;
- Critically analyse the differing approaches of national and regional governments in managing energy resources and pursuing sustainable energy futures;
- Demonstrate a deep understanding of the significance of energy to economic growth and societal well-being;
- Appreciate the value of engagement between universities, governments, industry, non-government organisations and communities in developing sustainable energy solutions;
- Illustrate an understanding of the critical role of technology and innovation to sustainable energy futures;
- Demonstrate further development of their research skills;
- Critically analyse and synthesise academic findings and industry research into clear and concise outputs that are tailored for several different audiences.

## Syllabus

The module is structured across five distinct themes, each of which is allocated two seminars. Reading materials will be provided to the students ahead of each seminar in support of a problem-focussed and participative approach to the topic in the weekly seminars. Lectures will provide further context in those weeks that require it.

### GLOBAL ENERGY AND THE ENERGY TRANSITION

1. Global energy and sustainability
2. Energy trilemma in different economic contexts

### ENERGY EQUITY AND SECURITY

3. Energy security
4. Energy equity

### ENERGY EFFICIENCY

5. Energy efficiency
6. Group poster presentation

### SUSTAINABLE ENERGY GOVERNANCE AND COOPERATION

- 7. Sustainable energy governance
- 8. International cooperation and development programmes

## INNOVATION AND INFRASTRUCTURE

- 9. Technological challenges in sustainability
- 10. Green innovation and green growth

## Assessment

(Pop-out table)

### Coursework

Discussion brief (2500 words) (50%)

Essay (2000 words) (30%)

Group Poster Presentation (20%)

(Pop-out table)

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### Contact Us

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