



ME927
Energy Resources and Policy

Tutors:

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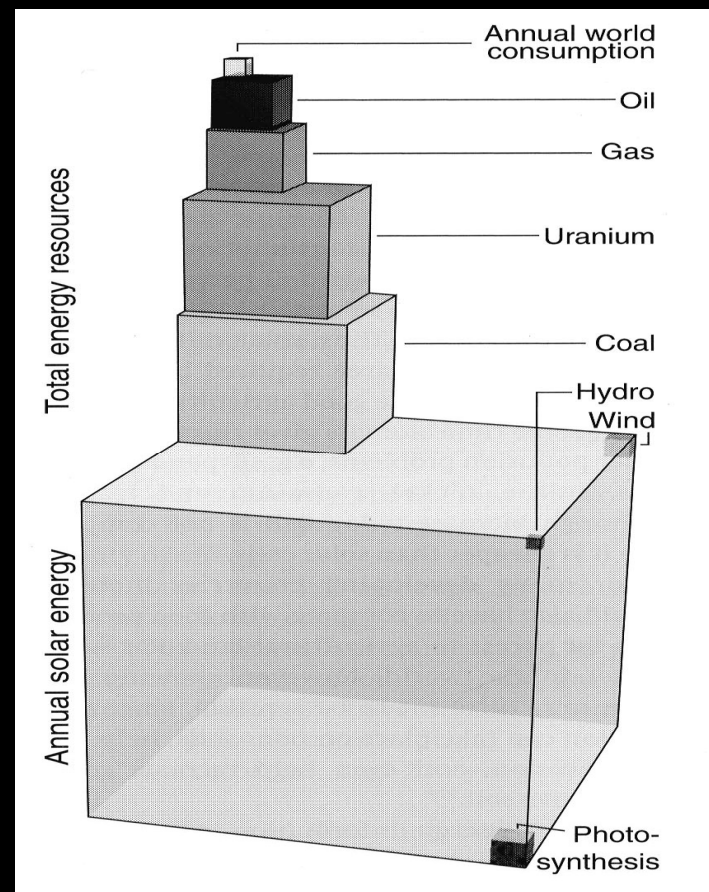
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Content

- ❑ Energy challenges & opportunities
- ❑ Policy and legislation
- ❑ Fossil fuels (coal, oil, gas)
- ❑ Nuclear
- ❑ Direct solar (solar thermal, solar furnace, photovoltaics, passive solar features)
- ❑ Indirect solar (hydro/wind/wave power, bio-mass/fuel)
- ❑ Tidal stream & barrage
- ❑ Geothermal
- ❑ Microgeneration & micro-grids
- ❑ Energy storage
- ❑ Energy systems modelling



The sustainable energy systems challenge
(Lomborg B 2001 The skeptical environmentalist)

Syllabus & evaluation

1. Syllabus online:
ME927 Myplace page
and www.esru.strath.ac.uk
select the **Teaching resources**
select the **ME927 Energy Resources and Policy** option.
N.B. Web resources may change so please refresh your browser regularly
and download material only AFTER each week's lecture.
2. Lecture slides and handouts available for download.
3. Tutorial questions for self-testing with model answers published in arrears.
4. Compulsory weekly group discussion & presentation on issues covered in lectures.
5. Assessment: 75% examination + 25% coursework:
 - Examination (2 hours in December 2019; answer 3 questions from 5; sample paper available on Web site).
 - Coursework comprising an individual technical assignments (see Web site for topic and submission deadline).

Learning outcomes

1. An appreciation of recent history and current trends in the energy sector.
2. An understanding of the impact energy has on the local and global environment.
3. The ability to undertake an evaluation of developments in renewable energy conversion technology.
4. A working knowledge of legislative, economic and environmental constraints and drivers.

Complementary resources

- ❑ MacKay D, *Sustainable energy – without the hot air* (www.withouthotair.com/).
- ❑ Shell Global Scenarios to 2050 (www.shell.com/scenarios).
- ❑ BP Review of World Energy (<https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy/downloads.html>).
- ❑ Digest of UK energy statistics (DUKES) (<https://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes>)

Units, notations and conversion factors

Unit	Abbreviation
Watt	W
Joule	J
Second	S
British Thermal Unit	BTU
Calorie	C
Tonne	t
Therm	T
Hour	h
Barrel of oil	BoO
Tonnes of coal equivalent	TCE

Notation	Prefix	Notation	Prefix
10^{-12}	Pico	10^6	Mega
10^{-9}	Nano	10^9	Giga
10^{-6}	Micro	10^{12}	Tera
10^{-3}	Milli	10^{15}	Peta
10^3	Kilo	10^{18}	Exa

Force (Mass x Acceleration)

$$1 \text{ N} = 1 \text{ kg.m.s}^{-2}$$

Energy (Force x Distance)

$$1 \text{ J} = 1 \text{ Nm}$$

Power

$$1 \text{ W} = 1 \text{ J/s}$$

Conversions

$$1 \text{ kWh} = 3,600 \text{ kJ}$$

$$1 \text{ kWh} = 3,412 \text{ BTU} = 860 \times 10^3 \text{ C} = 0.0335 \text{ T}$$

$$1 \text{ BoO} = 0.136 \text{ t}$$

$$\text{energy content} = 1.64 \text{ MWh}$$

$$\Rightarrow 1 \text{ t} = 12 \text{ MWh}$$

$$1 \text{ TCE} = 8.141 \text{ MWh}$$