

Powered by Rock

Earth's Energy Systems



Dr Liam Herringshaw

lgh865@hotmail.com

Course aims

Exploration of how geology controls energy

“If you can't grow it, it has to be mined”

Explanation of the research process:

Which data should we use?

Not answers, but better-informed debate

Will we change our minds?

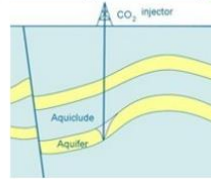


Geo-energy

Petroleum



Carbon Capture and Storage



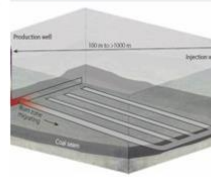
Unconventional Hydrocarbons



Geothermal



Clean Coal



Resources from Waste



<https://www.dur.ac.uk/cerees/>

Week 1: Introduction

What do we need to consider?

How do we collect data?

Course overview

Discussion

Resources

WARNING!

No class next week

Extra class after final week?
(would be March 17th)

Or two 3-hour classes?

Course structure



Week 2: Coal

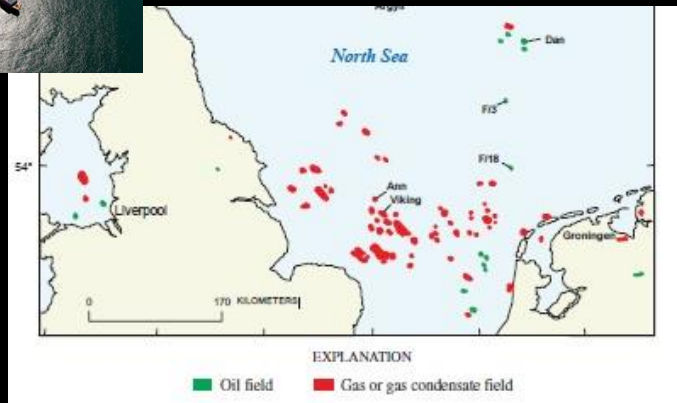


Course structure



Week 3: Oil & Gas

(incl. fracking)



Course structure

Week 4: Nuclear

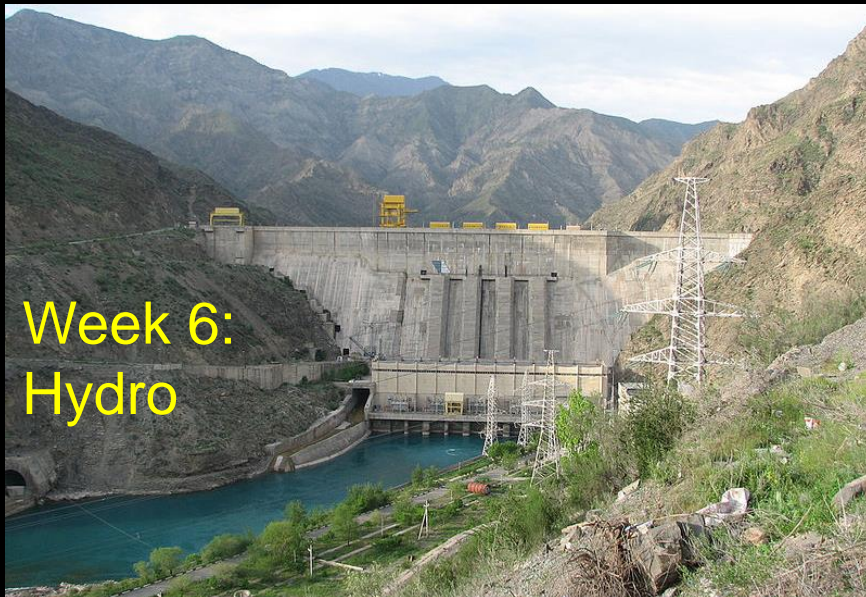


Course structure



Week 5: Geothermal

Course structure

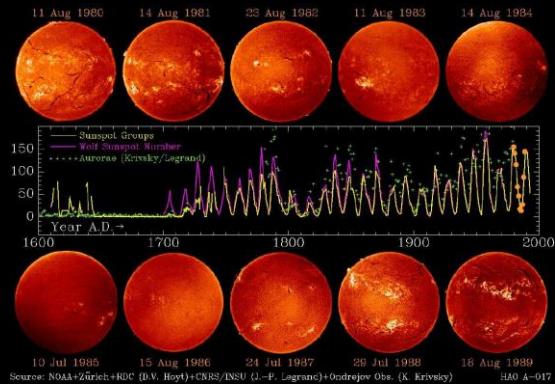


Week 6:
Hydro

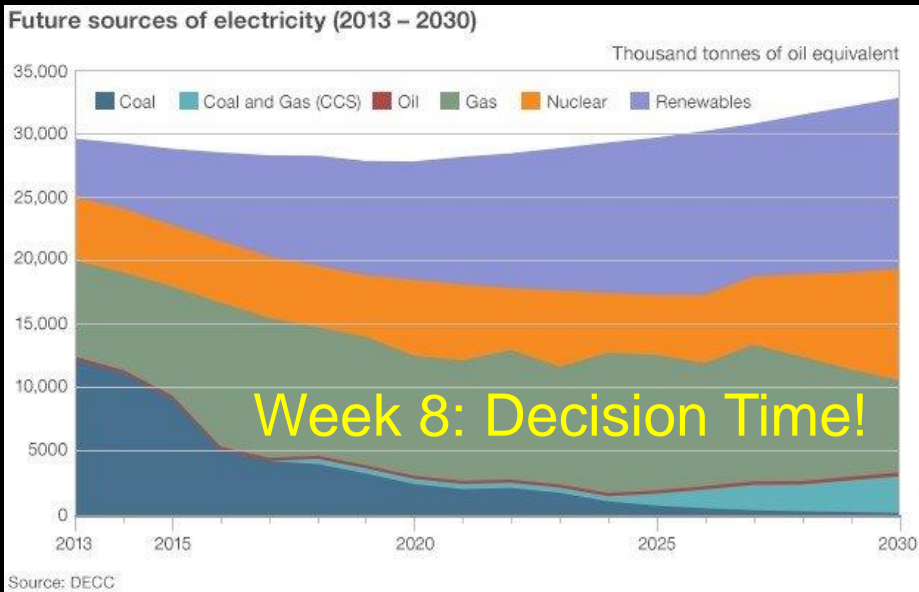
Course structure



Week 7: Wind & Sun



Course structure



Petroleum



Considerations?

Geothermal



What factors need to be taken into account?



Structure of each class

- 1) Brief intro
- 2) For v Against discussion
- 3) My lecture
- 4) Jury decision

Your thoughts?

1) What powers the UK?

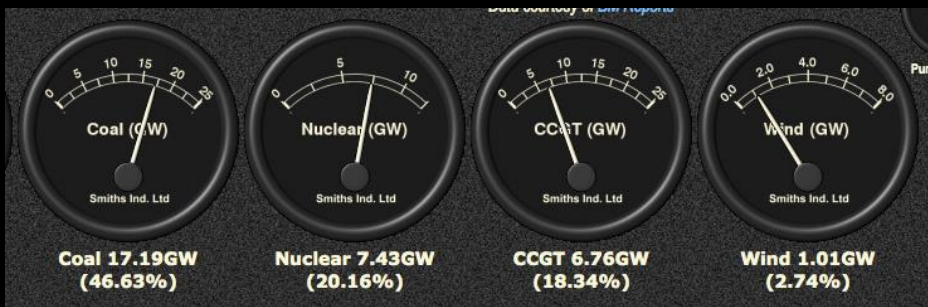
Coal, oil, gas, nuclear, geothermal,
hydro, wind, solar

Rank them 1-8

2) What *should* power the UK?

Rank them again by preference

National Gridwatch

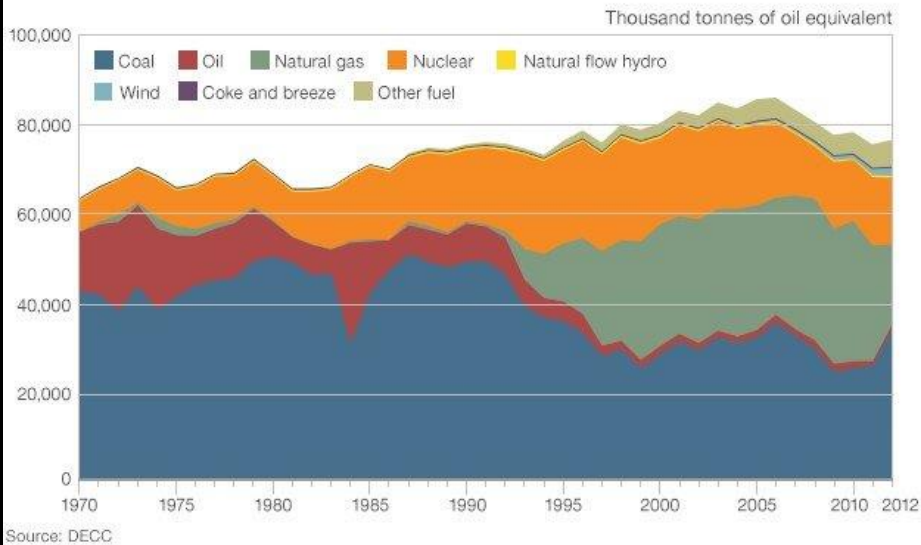


Jan. 19th 2014, 10pm



UK electricity trends

Breakdown of sources of electricity (1970-2012)



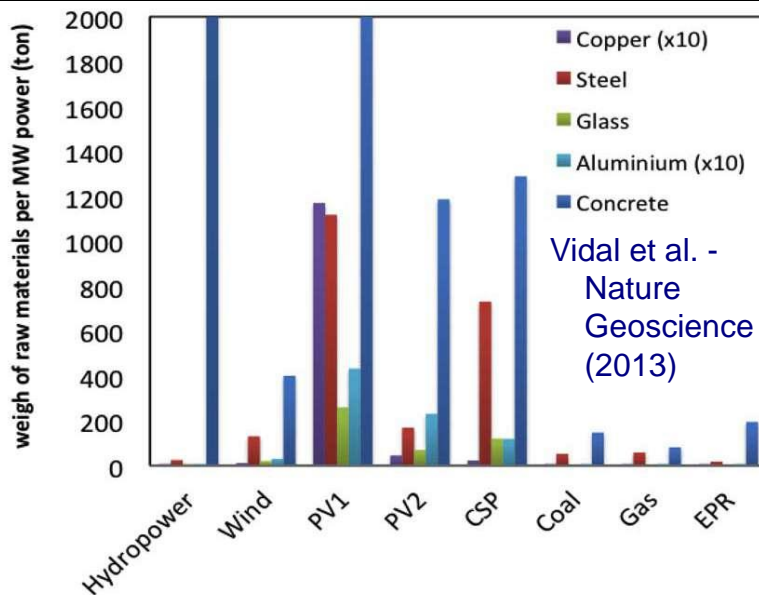
My thoughts

- Fossil fuels popular, polluting, cheap
- Nuclear not that bad
- Renewables the future, but complicated
 - Need full fuel footprints
- Integrate diversity of energy sources
- Exploit local sources
- Reduce consumption

Resources?

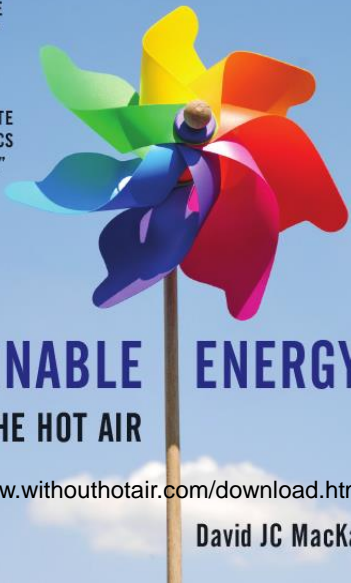
How can we make informed decisions?

Can't get (hand)out for nowt



"THIS BOOK IS A
TOUR DE FORCE ...
AS A WORK OF
POPULAR SCIENCE
IT IS EXEMPLARY"
THE ECONOMIST

"THIS IS TO
ENERGY AND CLIMATE
WHAT FREAKONOMICS
IS TO ECONOMICS."
CORY DOCTOROW,
BOINGBOING.NET



**SUSTAINABLE ENERGY—
WITHOUT THE HOT AIR**

<http://www.withouthotair.com/download.html>

David JC MacKay

Download
**Sustainable
Energy
Without
The Hot Air**

The Hat of Random Energy
Judgement

5 x FOR

5 x AGAINST

6 x NEUTRAL (jury)

Will change every week



Next class: Coal

FOR – make an argument in favour of coal

AGAINST – make an argument against

Is it part of our future energy mix?

Resources

www.fossilhub.org / lgh865@hotmail.com

IEA: <http://www.iea.org/>

USGS: www.usgs.gov

BGS: www.bgs.ac.uk

DECC: www.gov.uk



York Uni resources

Library access

Tours can be arranged:

Vanya Gallimore
(Academic Liaison
Librarian)



FINAL REMINDER

No class next week

Extra class after final week?
(would be March 17th)

Or two 3-hour classes?

STOP PRESS!

“Unconventional Energy”

Yorkshire Geological Society meeting

<http://www.yorksgeolsoc.org.uk/Circulars/584.pdf>

**Saturday 25th January, 2pm start,
Hancock Museum, Newcastle.**