

EAUC-Scotland Conference The Elephants in the Room

Tuesday 26 November 2019 The Lighthouse, Glasgow











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#EAUCS2019

Fossil Fuel Divestment:

Moral High Ground or Vacuous Posturing?

More "Inconvenient Truth[s]"?

The Keeling Curve



August 2018: 406.95 ppm

August 2019: 409.95 ppm

https://research.noaa.gov/

Vostok Ice Core



Glacial to interglacial 100 ppm CO₂

Recently exceeded 400 ppm

J.R. Petit et al., 1999. Nature 399, 429-436

So, the science undoubtedly indicates that fossil fuel use is causing global warming.

Without doubt we need to reduce emissions of CO₂ and other greenhouse gases e.g. methane and nitrous oxide.

At issue are (1) feasibility and (2) impact on humans.

Palaeocene-Eocene Thermal Maximum c. 56 Ma

The Geological Perspective

56 Ma ago CO₂ ~ 2000 ppm

Saving the planet or saving the people?

ο



Surface
X Thermocline
O Benthic

D.J. Thomas et al. 2002 *Geology*. **30** (12): 1067–1070.

ENERGY: Can we really have everything?



Scotland's Energy Use:

• Heating: 55%

- Transport: 24%
- Electricity: 21%



Of course, as electric vehicles become more popular, transport and electricity will be increasingly linked.

GAS: Critical commodity for Scottish Economy.

- Fossil fuel but "greener" than coal lower C/H and higher calorific value.
- 82% of UK households use gas for heating.
- Fuel poverty defined as needing >10% of income to achieve adequate standard of warmth (24%).
- Alternatives to gas (electricity and oil) are more expensive (and more carbon intensive).

Daily Energy Generation





https://gridwatch.co.uk

Wind Power Outputs



https://gridwatch.co.uk

How "Green" are Renewables Anyway?

A 5 MW wind turbine uses:

Source: V. Smil, 2016.Spectrum.IEEE.org

- 150 tonnes of steel for reinforced concrete foundations, 250 tonnes for the rotor hubs and nacelle & 500 tonnes for the tower – steel blast furnaces use coke, powdered coal and natural gas.
- Glass fibre reinforced by epoxy or polyester (made from light hydrocarbons) in airfoils made by melting silicon dioxide in gas-fired furnaces.
- More metal for transformers, wires and HV links to grid.
- Trucks delivering raw materials, earth-moving equipment and freight trains transporting materials for plastics, steel and cement production all use diesel.
- >85% of rare earth metals have come from China with major ecological (including radioactive) and supply security consequences.

To supply 25% of global energy demand (2.5 TW) would require 450 million tonnes of steel and 90 million tonnes of crude oil.

Wind and Solar are "Fossil Fuel+". We are not going to be fossil fuel free anytime soon.

The Energy Trilemma



SOLVING THE TRILEMMA

- Politics understandably maximising renewable (even when security is dubious). Demand for associated resources e.g. REE magnets. Works both ways though, currently 50% Pt used in catalytic converters not used in electric cars.
- Gas (conventional and unconventional) with CCS (for which much expertise resides in the O&G sector) is the only realistic response for the UK. Other existing options have long lead times.
- Th-cycle nuclear safer technology with fewer waste implications remains experimental and little research effort.
- Changing the way we consume energy could make a major contribution e.g. self-sufficiency through e.g. ground-sourced heat pumps.
- Better building regulation e.g. insulation standards. Incorporation of district heating into new build, although note that one of the most successful schemes (Drammen, Norway) uses ammonia as the heat pump medium.
- Future-proofing new systems e.g. gas district heating that is ready to move to heat pumps and geothermal.



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Higher education in the context of the climate emergency



Why is fossil fuel divestment a global movement?

Primary and secondary markets



our money can change everything

Alleviating climate change and its implications is part of the charitable purpose



ShareAction»

What can be done?



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Responsible Investment Network - Universities



What can you do within your current role to lead your University to become a responsible investor?



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Responsible investment themes





Climate/ Sustainability

- X Climate
- Water scarcity/ pollution
- Biodiversity/
- extinction
- Pollution
- >> Air pollution



Food/health

- **>** Factory farming
- Mental health
- Drug pricing



Governance

Corporate lobbying

- » Tax
- >> Trade
- Board effectiveness
- Succession planning



International

- International
- development
- Refugees/
- migration
- >>> Heritage





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