Climate Change and Energy Policy

October 2021

Steve Sorrell and Matthew Lockwood

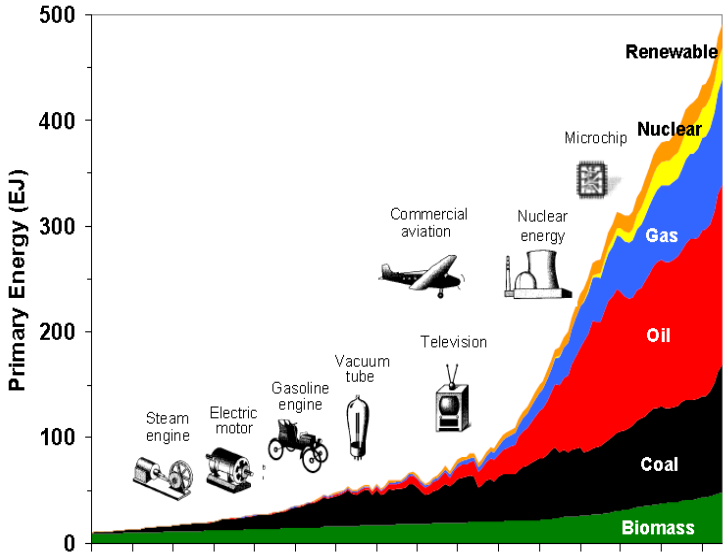
University of Sussex

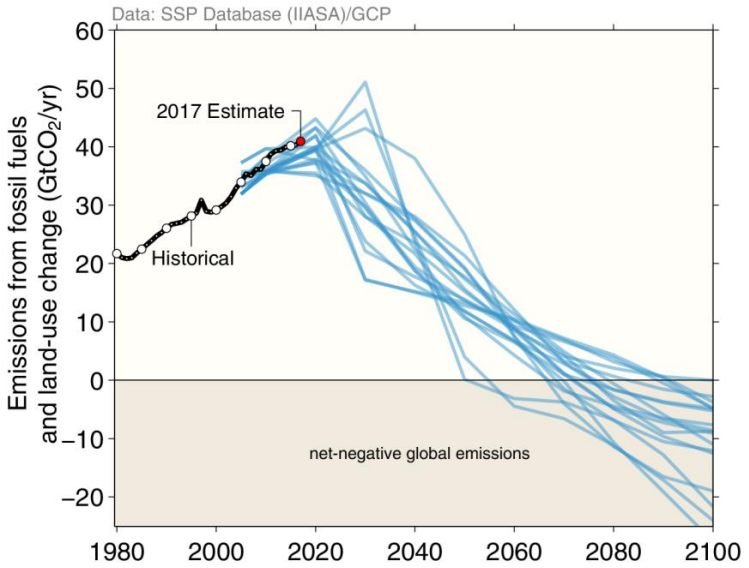
Sussex Energy Group
SPRU - Science and Technology Policy Research

Why Energy?

University of Sussex

- Economic growth and improved human welfare depends upon increasing access to modern energy services
- Modern industrial economies consume vast and growing quantities of energy, mostly derived from fossil fuels.
- Our current trajectory threatens catastrophic climate change
- Need a global transition to **net zero carbon emissions** in around 50 years – a formidable challenge





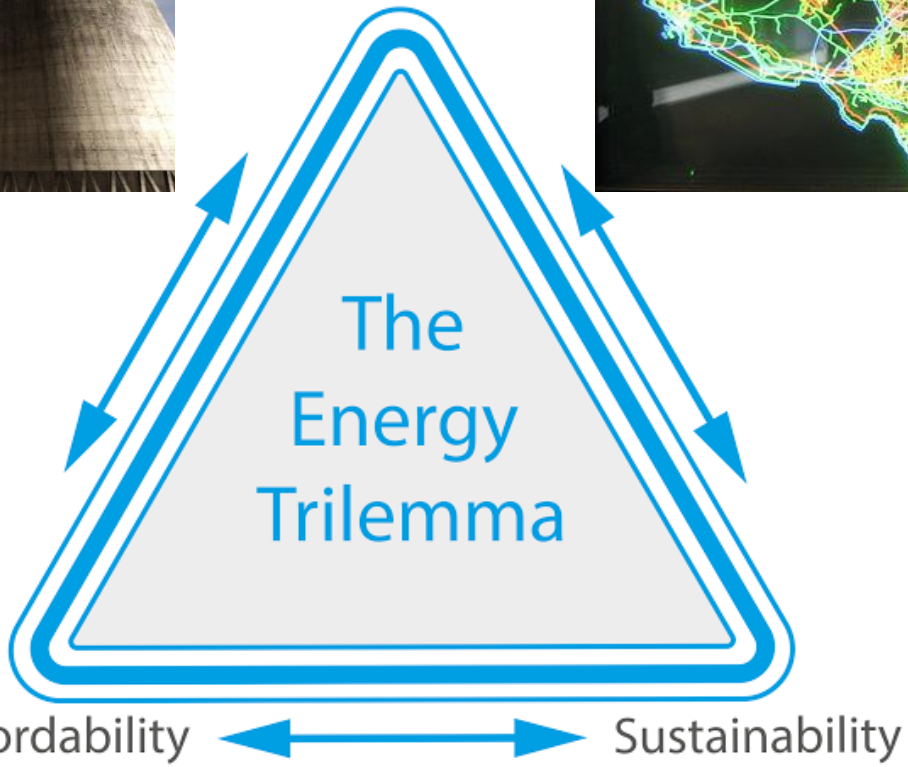
The Energy Trilemma

University of Sussex

Secure

Resilient

Security of supply



Accessible

Efficient

Equitable

Low carbon

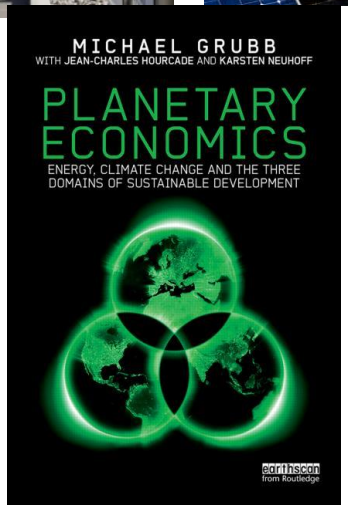
Renewable

Clean

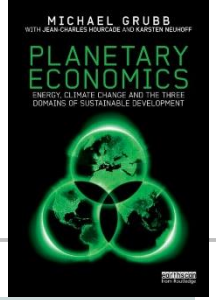
Approach

University of Sussex

- **Specific challenges** in energy and climate policy
- **Low carbon transition**, but also efficiency, equity, security
- **Interdisciplinary**, policy-focused, contemporary
- **Three pillars**: satisfice, optimise, transform
- **Assessment**: Group Presentation 20%; Individual Essay 80%



Three pillars of low carbon energy policy



University of Sussex

Satisficing	Optimising	Transforming
Behavioural economics, social psychology	Orthodox economics	Innovation studies, socio-technical transitions
Standards, information, engagement	Economic incentives	Green industrial policy; strategic investment
Encourage technology adoption and behavioural change	Effectively price carbon	Support low carbon innovation and systemic change

Facilitates →
← Encourages

Encourages →
← Facilitates

Source: Grubb (2014)

Setting the scene

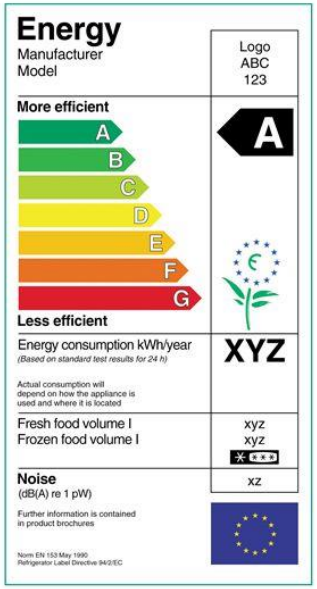
University of Sussex

1. Introduction: themes, history and context

Using less energy

University of Sussex

2. **Energy, economic growth, human welfare and sustainability**



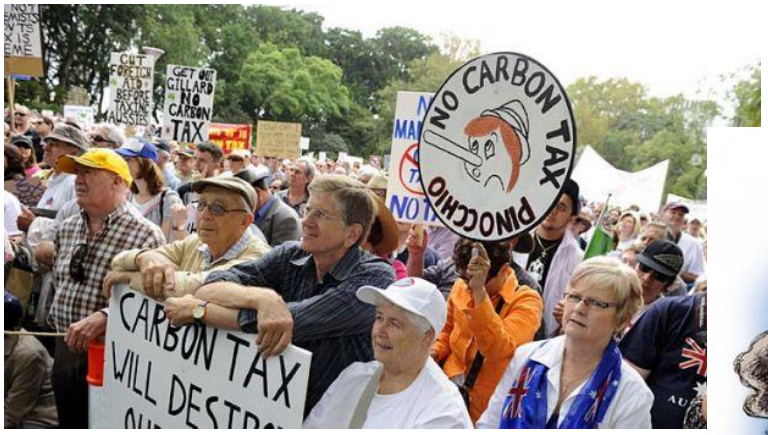
3. **Energy demand and energy efficiency**

4. **Energy and mobility**

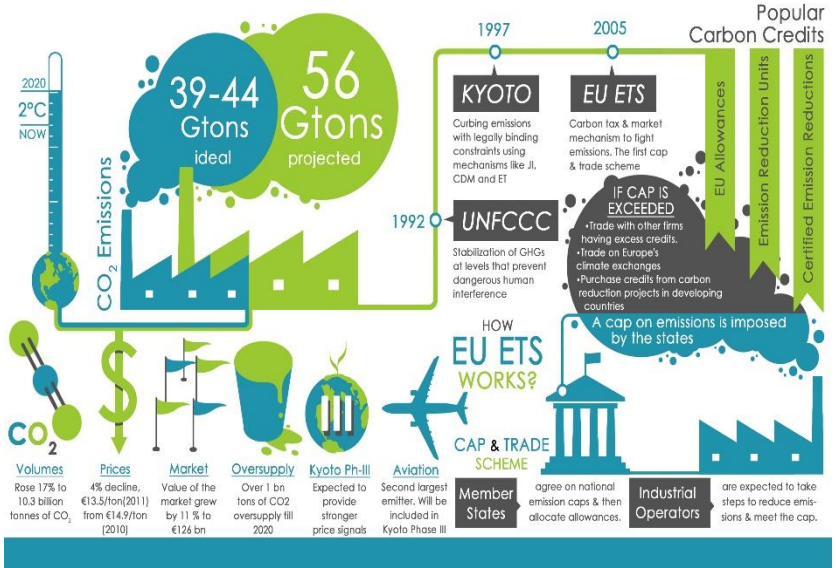
Pricing carbon

University of Sussex

5. Carbon taxes



6. Carbon emissions trading

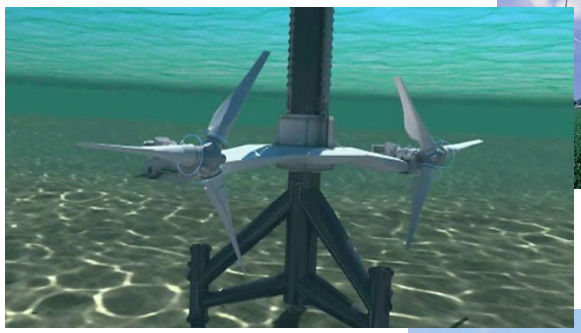


Replacing fossil fuels

University of Sussex

7. Electricity systems, markets and regulation

8. Renewable energy: sources and technologies



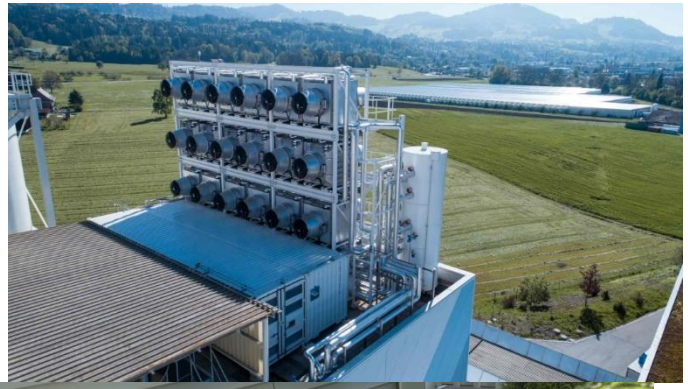
9. Renewable energy: economics and policy

10. Nuclear power

Getting to zero

University of Sussex

11. Getting to zero: technical and policy challenges and strategies

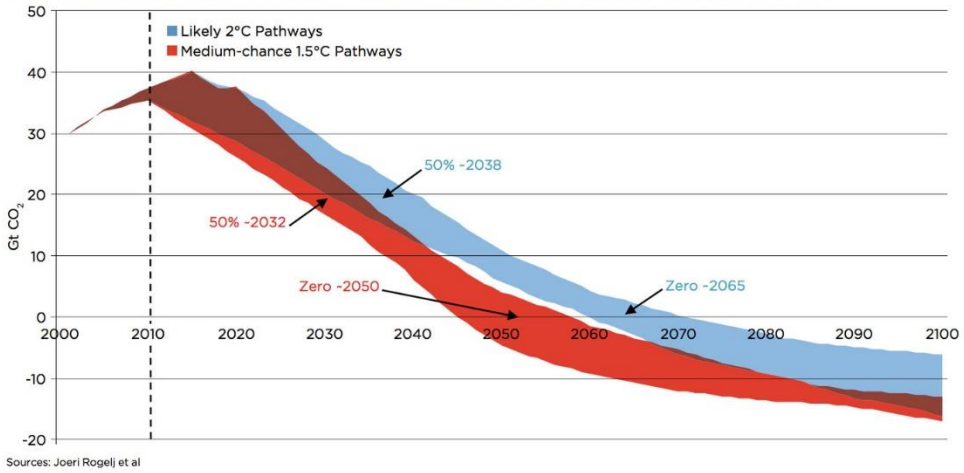


Supplementary lectures on:

Energy and climate change

Energy resources and depletion

Figure 1: Range of Global Emissions Pathways in Scenarios Consistent with Likely Chance of 2°C or Medium Chance of 1.5°C[18]

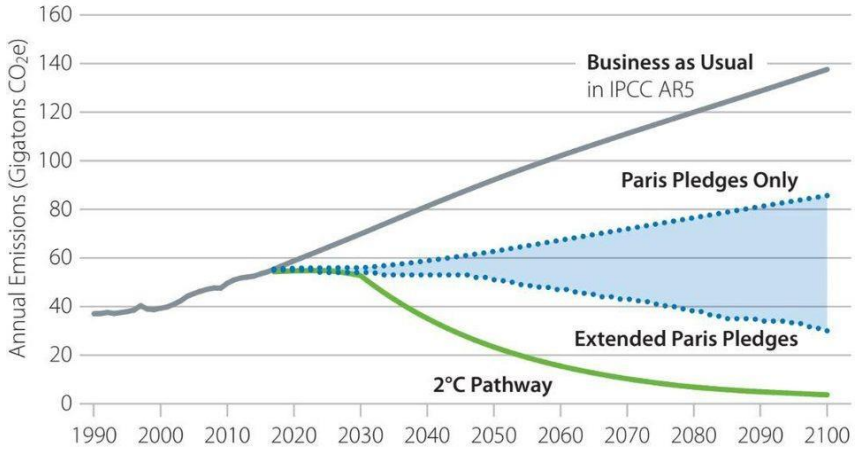


Sources: Joeri Rogelj et al

Seminars – Group activities (x8)

University of Sussex

- **Group discussion/presentations**
  - Energy perspectives
  - Energy controversies
  - Energy efficiency policy
  - Energy innovation policy
- **Energy modelling**
  - Global energy futures
- **Simulation game**
  - Global emissions trading
- **Debates**
  - Negative emissions



Seminars – Group Presentations (x3)

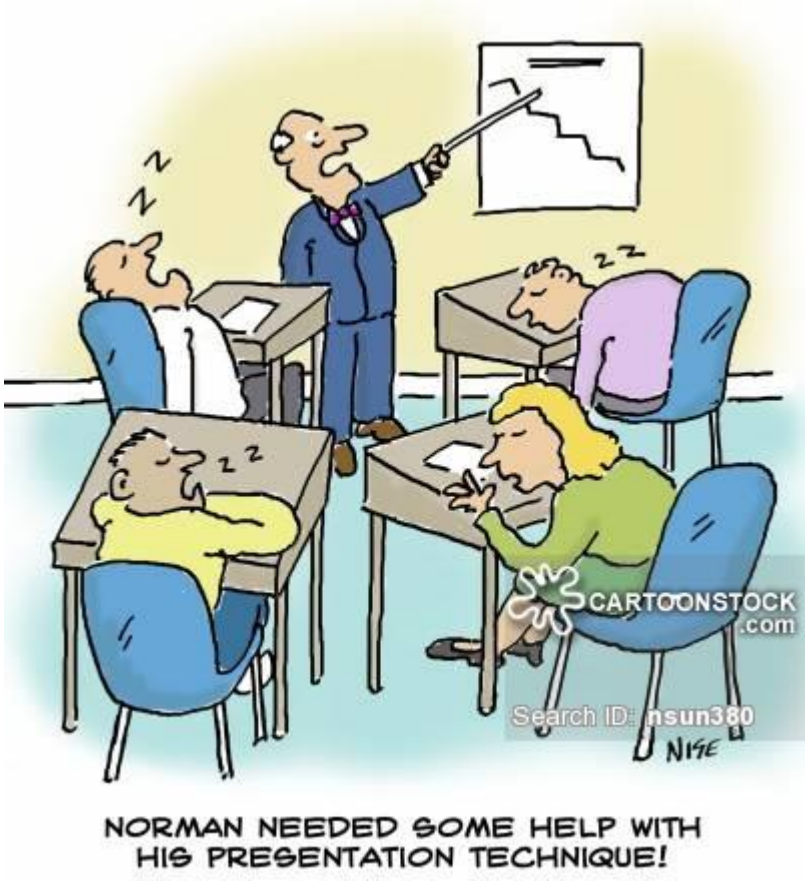
University of Sussex

- Electric vehicles
- Energy poverty
- Energy access
- Renewable heat
- Hydrogen
- Biofuels
- Energy subsidies
- Energy security

Assessment – Group presentations (20%)

University of Sussex

- Content of Presentation: 70%
- Delivery of Presentation: 20%
- Responses to questions: 10%
- Keep to time!



NORMAN NEEDED SOME HELP WITH HIS PRESENTATION TECHNIQUE!

Assessment – Individual essay (80%)

University of Sussex

- Encouraged to propose your **own topic** – although suggestions provided
- Must address themes and issues **relevant** to the module
- Essay titles in the form of a **question** - must be approved
- Must adhere to guidance on good practice in essay writing
- **5000 words**

Module evaluation

University of Sussex

- The module has received an average score of **94%** over the last five years in end-of-term student evaluations
- Some comments from students in 2016-17:

•"… Excellent……Knowledgeable teachers, interesting and relevant course material..."

•"… thoroughly enjoyed the entire module. Lectures were detailed, comprehensive and specific. New terminologies and concepts were well explained. Seminars were very engaging. A fantastic collection of videos on every topic complemented well with the lectures…"

•"…incredibly well resourced….overview was very comprehensive and applicable to contemporary problems…."

"….well organised, clearly structured, lots of useful material was provided and made easy to find. Seminars were challenging and interesting and lecture content varied…."

University of Sussex

Questions?

s.r.sorrell@sussex.ac.uk