

# Key Headline Issues

A selection from last year's Farnham U3A Sustainable Energy Session

Electricity Generation

Industrial Processing

Buildings

Transport

Food and Land Use

What can an individual do?

What can / should governments do?

Stewart Edge Oct 2022

# Electricity Generation

- **Success to date**

- Removal of coal
- Wind and solar are now significant
- Cost of wind (off-shore and on) has dramatically reduced

- But still significant **changes required** to reduce dependency on gas

- Framework for (offshore) wind established – auction licences and ‘contracts for difference’
- Nuclear dithering (Sizewell C) and problems (Hinckley Point)..... But Johnson Government firmer plans

- **Nuclear**

- Conventional ) In latest government strategy
- Small Modular Reactors (‘Rolls Royce’) )
- **Advanced Modular Reactors ....future? Potential game-changing: waste and safety**

- **Challenges of Intermittent Renewables**

- Wind / solar – inevitable peaks and troughs in supply
- **Capture excess power – eg for Hydrogen production (electrolysis)**
- **Fill supply troughs**
  - Eg by use of individual electric car batteries to feed back into grid
  - **Could reduce by 40% in 2035 (ie by 20GW ) the gas-fired capacity needed to cover when insufficient renewables**

reserve

# Industrial Processes

- Imported Goods
  - UK's direct Greenhouse Gas (GHG) consumption is artificially low at 500MTonnes Co2 equivalent
  - **Need to add GHG within imported products making UK grand total 700MTonnes**
- Move to 'Net Zero' for industry requirements in particular:
  - **Hydrogen** (planned for November session)
  - **Carbon Capture and Storage** (planned for January session)
- Note special case for key products:
  - **Steel – approx. 7% World total GHG:**
  - **Cement - approx. 4% World total GHG:**
    - from fuel and from chemical reaction
    - Green steel possible using an electric arc with green hydrogen / electricity
    - Cement will need Carbon Capture

# Buildings

- Steel, cement in construction
  - Construction can be 10% - 40% of lifetime use of energy
  - Minimise through building standards; retrofit rather than demolish?
  - Heating and Insulation
- Average UK house consumes 11,400 kWh energy / year
  - Passive House – high energy- efficient new house would be 1,400 kWh / → **High standards needed for new build**
  - **Insulation / draughtproofing of existing housing stock**
  - Use efficient (condensing) boilers.... **Eventually heat pumps**

# Transport

- Electric cars direction clear, though still issues such as charging points
  - Note GHG during construction significant: (Volvo EV 25 Tonnes construction Co2 versus 20 running use if current EU28 electricity mix – petrol 18 / 40 )
  - **→ Gradual change to electric cars - rather than rapid scrapping of (fuel-efficient) diesel/petrol cars**
- Disappearance of car tax fuel duty on diesel / petrol significant issue
  - (£35B / yr)
- **Goods vehicles**
  - **Hydrogen vital for solution**
- **Aviation – 9% UK total GHG; 1/3 of UK transport GHG**
  - Reduction ‘possible’ using Sustainable Aviation fuels (from ‘sustainable feedstocks’) blended with normal jet fuel giving 50% overall reduction
  - Offsetting (??)
  - Reduced growth of air travel will inevitably be required.....**
- Marine
- Biofuels ..... So far excessive use of limited agricultural land: next generations possible, but limited /
  - costly?



# Food and Land Use

- **25% of UK GHG totals from food** (including manufacture / distribution)
- **Red meat and dairy are significant GHG contributors** (Vegan best!)
  - Significant use of crops fed to animals
  - Methane from cows
  - And repurposing grassland can sequester carbon ....(trees)

*(some challenges raised last year.....will be revisiting)*
- **Avoid air-freighted foods; avoid waste**
- **Use of fertiliser..... *(need to revisit)***
- **Plant trees**
- **Look after Peat**

# What Can an Individual Do? - Summary

- Hard to avoid the 'hair shirt' to make a dramatic difference?
- Flying, especially long haul...and Cruises
  - No large fast cars ..... And share cars
  - Avoid food which has been flown in
  - Don't waste energy heating home too much
  - Drop the pressure for more grandchildren
- But significant reductions possible
- Change to an electric car quite soon (and get on your (E-)-bike) • Insulate your house fully – change to heat pumps in a few years' time
- Watch red meat and waste food
- Repair, re-use, share equipment wherever possible



# What can/should Governments do?

- UK Carbon Change Committee ) September session
  - UK Government Policy )
  - International COP process COP26, COP 27 December session
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- Extinction Rebellion
  - Just Stop Oil