ZeroCarbonBritain
Centre for Alternative Technology
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http://www.inforse.org/europe/seminar09_Artefact.htm

Introduction

- Founded in 1973 & open to public in 1975
- 1977 Alternative Energy Strategy for the UK
- Against prevailing beliefs of the time

An Alternative Energy Strategy for the United Kingdom
Our wellbeing depends on:

- Climate Security
- Energy Security
- International Security
- Economic Security

Climate Security

- The long-industrialized west need to move to zero emissions as quickly as is ‘humanely’ possible
- To allow the majority world nations ‘headroom’ to develop their basic human infrastructure

Energy Security

- Fossil Fuels are incredible!
- 1 Gallon = 6 weeks labour
- US daily use = 20,000,000 person years of labour

(Haiberg 2007)
Energy Security

There are currently 98 oil producing countries in the world, of which 84 are thought to have passed their geologically imposed production peak, and of those 60 are in terminal production decline. (David韬克 http://www.energysite.net)

Energy Security

The EROI of oil and gas extraction in the U.S. has decreased:
100:1 in the 1930's
30:1 in the 1970's
11:1 as of 2006
(Carter Cleveland, Boston University)

Energy Security

For the first time in our history, just as demand is exploding across the globe, humanity will no longer be able to increase energy production year on year!!!
Industry Taskforce on Pea

- Current measures are insufficient
- Action to alert and inform
- Urgent need for preparedness
- Report launched in 200
- CAT acting as ‘consultant
- Free download at peakoiltaskforce.net

Economic Security

![Chart: UK balance of trade in oil, monthly outturns, £m]

Source: ONS, OBR

Economic Security

![Chart: GFCF, billions in 2003]

UNEP, data from World Bank 2004

International Security

An integrated solution

- International security
- Energy security
- Climate security
National & International policy frameworks

- Descending Cap = effect
- Equity = buy-in
- Consensus = delivery

National & International policy frameworks

- Enforceable
- Include ‘embodied emissions’
- Stable / predictable
- Low administrative burden
- Responsive & capable of evolution
- Capable of reaching zero
- Reform markets
- But don’t expect it to do everything!!

National & International policy frameworks

- ‘Command and Control’ interventions
- Taxation
  - net equal
  - additional
- Quotas
  - Tradable Energy Quotas
  - Cap and Trade
  - Cap and Share

Contraction & Convergence

![Graph showing Contraction & Convergence over time]

 Tradable Energy Quotas (TEQs)

- Motivation for change across all sectors
- 40/60 split
  - 40% given free to individuals
  - 60% to auctioned to industry

TEQs for Individuals

- Only for fuel
- Receive a year’s worth at the start
- Topped up weekly
- Tradable!
- Safely net
TEQs for **Business**
- Initially a year’s worth put up for tender
- Weekly tender follows
- Bought through banks
- Budget looks ahead, provides certainty
- Other taxation reduced
- Stimulates zero-carbon business practices...

### Market reform
- Market rules were set before we understood climate change, and the industrial world was awash with fossil fuels
- It works to the lowest (externalised) cost option — it is essentially carbon-blind
- So it uses far more energy than is actually necessary to deliver our well being

### Carbon conscious market reform
- Make carbon visible to the market
- Harness the power of the market
- Lowest carbon = most economic
- A ‘market-driven’ race out of carbon
- Driving technology innovation

### “Technology Scenario”
National, regional, community & domestic scale

- Sector by Sector
  - Household
  - Industry
  - Transport
  - Agriculture & Services
- 50% overall reduction achievable
Household

- Large-scale retrofit of existing stock
- All new-build to be zero-carbon
- Replace worst performing dwellings, with exceptions
- Behaviour change
- Intelligent appliances

Transport

- Switch to electric vehicles – huge savings
- Freight to rail
- Modal switches - "earthports"
- V2G
- Cycling & walking
- Liquid biofuels grown on-farm for farm use

Agriculture & land use

- Switch from fossil fuel fertilisers etc.
- Re-localisation of production
- Significant land-use changes
- More biomass production e.g. wood fuel
- Reduction in stocking levels

Another new index: The amount of money this would inject into the UK economy!
Electricity becomes the main way we move energy.

Every roof, garden, hill top, island, coast, forest becomes an energy and income generator.

As we get better at extracting energy through increasing economies of scale and advancements in technology, the annual yield (and income) increases.

Electricity supply & demand

Heat supply & demand

Variability

- Dealing with demand
  - Reduced overall by 50%
  - Intelligent demand management
- Generation distributed to minimise variability
  - By region
  - By technology
- Storage - V2G, flow batteries, pumped storage

European Integrated scenario ....
Conclusions

- Scientifically inescapable
- Economically unavoidable
- Technically achievable
- It must now become **socially & politically thinkable**

... sooner than expected

- 6 weeks after CAT presented ZCB in Westminster, the UK Liberal Democrats launched their policy called “Zero Carbon Britain – Taking a Global Lead”
- "These proposals were largely inspired by the Welsh based Centre for Alternative Technology and I would like to thank them for the ground-breaking work."
  
  (Lembit Opik, Shadow Secretary of State for Business and Enterprise)

A Community of Practice

Between forward-thinking organisations and first movers!

ZCB:2 Economy & Employment

A large-scale economic stimulus package to power down demand & power-up renewables would:
- Create employment & stimulate the economy
- Dramatically improve future balance of payments
- Inject revenue into the economy every day
- Repay the taxpayer from the energy saved/generated
- Future-proof the economy against energy price shocks & blockades

ZCB:2 Funding the transition

- Many individuals, institutions & Governments are now seeking ‘secure investments’
- Future demand for electricity is very secure
- Future price paid for electricity is very secure
- Future costs for renewables are predictable
- Government backed ‘eco-bonds’ as per WW2
- Releasing a wall of both public & private capital

It’s transition time...

- Change is coming, ready or not
- Our choice is between a future where we have been proactive and acted ahead of events, and a future where we have let events overtake us.