Hotair comments part 2

14.UK Final Energy consumption DUKES 2006
I found :-
Transport 32
Domestic 27
Industry 20
Rest 20
total 168 MTOE
It may be worth updating the 2003 figures you give.

15. Cant see label fig 17.1

16. Page 116 interchangeable energy sources.
I swear I did hear a visiting fellow at Imperial Ccollege saying on Radio 4 in 2007 that "of course you can't boil a kettle or heat your house with nuclear" which is about as reasonable as feeding youc with electricity.

17. Page117. CO2 production. I found these DEFRA figures .
Oddly they exclude international transport (+40Ktons) and are not easily (by me at least) reconciled with DUKES energy data.

	UK 2005 Mtons CO2	
Electricity generation	172.3	31.0%
Fuel manufacture	36.2	6.5%
Manufacturing industries and construction	85.1	15.3%
Road transport	119.9	21.6%
Aviation	39.8	7.2%
Other - transport	6.7	1.2%
Commercial and institutional	23.4	4.2%
Residential	83.3	15.0%
Agriculture and forestry fuel use	4.5	0.8%
Military aircraft and shipping	2.8	0.5%
Fugitive emissions from fuels	5.9	1.1%
Industrial processes	13.5	2.4%
Total excluding	556.2	100.0%

18. Page 117 Electricity production by fuel DUKES
This agrees with 3.82 MTOE for renewables at a conversion efficiency of about 30%

UK Electricity 2006	
Primary and secondary	GWH
Nuclear	75451
Hydro	4605
Wind	4232
Other renewables	9947
Other	3615
non carbon	97850
Coal	150283
Oil	4999
Gas	141342
Total production	394474
RENEWABLE	18784

18. Page 117
"We need everything we can get our hands on – all the wind, and all the nuclear"
Page 117 is a bit early for the conclusion! { by chapter 19 however....)

19 Page 120 Round figures energy bteakdown

Starting from DUKES 2006 total primary energy of 243 MTOE/y and converting to kWh/d the breakdown is:-

	MTOE/y		kWh/d	kWh/d roughly	
yours					
Conversion	75	38	40		27
Final consumption					
Industry	25	13			
Transport	53	27	30		40
Domestic	37	19}	25	= heating or 30 inc industry	40
Shops/offices	10	6 }			
Electricity	27	15	15		18
Rest	16	8			

It is not so different and I may have got it wrong but maybe worth checking. In omitting industry you have finished the task begun by Mrs Thatcher and in eliminating agriculture you are following the path set by Mrs Beckett.
20. Page 139 I assume you will add other fossil fuel reserves including tar sands shales and bitumen.. And some discussion of the reliability of reserve estimation.

21. Page 147 Cost of solar thermal power.
The figures quoted of euro 0.14-0.18 falling to 0.04 @ 100GW is quite dramatic remembering that offshore wind is about euro 0.1 kWh. and on this weeks evidence mounting. Liked today's news story on the shortage of barges!

22. Page 157 Coaches as good as trains but not in France.

		vehicule occupancy	CO2 Kg/p100km	
medium car		**50%**	**11.9**	
single deck bus		**80%**	**2.1**	
b737		**90%**	**10.9**	
HS Train *		**90%**	**2.1**	
HS Train **		**90%**	**0.7**	
*	**100% fossil fuel generation (eg Germany)**			
**	**20% fossil fuel generation (France)**			

23. Page 158 Cars are just over half of road transport CO2 emissions

CO2 Mtons UK 2005		
Road transport	**120**	
Passenger cars	**70**	**58%**
Light duty vehicles	**17**	**14%**
Buses	**4**	**3%**
HGVs	**29**	**24%**

24. page 162 Transport efficiencies.
I think there are some surprises and myths, ie fuel cells are the answer.

Electricity to vehicule wheel			
	H2 GAS IN FUEL CELL		ELECTRIC VEHICULE
Electrolysis	0.7	mains dist	0.95
compression	0.9		1
distribution	0.9		1
transfer	0.97		1
Fuel cell	0.5	car charger	0.92
Losses	0.9	battery	0.8
drive	0.9	drive	0.9
regen braking	1		1.1
total	22%		69%
CO2 TON/MWH	1.9		0.6

(Electricity from NG @43%)

So, it takes 3 times as much energy input to drive a car via a fuel cell powered by H2 generated by electrolysis than just sticking in the electricity directly. The electrolysis and fuel cell losses are not usually emphasised by the fuel cell protagonists. Are they right?
Of course the CO2 reflects the efficiency.

25. Page 162 Transport efficiencies .
And see even an old stinking diesel is better than a H2 fuel cell (if the hydrogen comes from fossil fuel generated electricity. Also these data suggest that it is better to convert HCs to hydrogen and feed it to fuel cell than use the HC to generate electricity to produce hydrogen. Is this not a super chance to show the elegance of applied thermodynamics

Crude oil to wheel		
	DIESEL	NAPHTHA
	ENGINE	FUEL CELL
refining	0.88	0.88
Losses	0.98	0.95
FC/engine	0.32	0.5
drive	0.9	0.9
total	25%	38%
CO2 TON/MWH	1.0	0.7

26 page 162 Trams

please use an old shuggly from Glasgow instead of Blackpool.

27 page 181 Heat pumps.

the graphical presentation - very informative
In France air-air heat pumps have COP ~ 4 and are subsidised since the government realised that this cost them less than letting EDF go on building more (low carbon) generating capacity. Their dilemma is to encourage this form of heating while stopping the equipment being used for aircon in the summer.

28 Page 199 Rory Bremner
If you want people to believe this message you will to cut out the incredible bits.

29. Page 200. Whats needed?
E.on Kingsnorth coal fired power station
E.on, faced with the need to meet emission requirements have worked out that it is cheaper for them to rebuild a low polluant and *slightly* lower carbon station (clean coal) and get the carbon credits or a revamped renewables obligation to pay for it. They have been watching the TV salemen and have have decided to call it “CCS- ready”. A CCS -ready power station might be more credible if it was being built a bit nearer Aberdeen or Lowestoft than in Kent. In spite of the long term non-sustainability of fossil fuel power, any new fossil power should be CCS. If CSS is not proven then let them spend the R&D to prove it, and allow them to run the old dirty stations at a penalty until they do. George Bush prefers to pay the R&D himself.

30. Phone Chargers
Perhaps they are figuring too prominently.

31. Page 220 economics

I found	£/kW
coal IGCC	1000
Coal IGCC+CCS	1700
Nuc	1400

This does not change the argument and both sets of figures are wrong anyway.

32. Page 237.
I shall read but not comment on the technical chapters!
generally
1. We need this document
2. It has confirmed a lot of what I had thought but has brought startling new insights in terms of sustainability, desert thermal and pumped storage to tackle intermittency
3. The comments I have made are take it or leave it. Please do not waste your time replying
4. Looking at the draft nature of part 2 there is lot to do
5. How about confidence limits?
5. Please get it finished and published before more serious errors are committed.

Congratulations

Stephen Bull