
Carbon and Congestion: Can HM Treasury Save the White Paper?

THE ENERGY WHITE PAPER ONE YEAR ON

Cornwall Consulting Summer Event

22 July 2004

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What the White Paper Implies

Decision Drivers

Future Environmental Taxes?

UK EWP refocused energy policy away from a pure liberalisation / competition agenda...

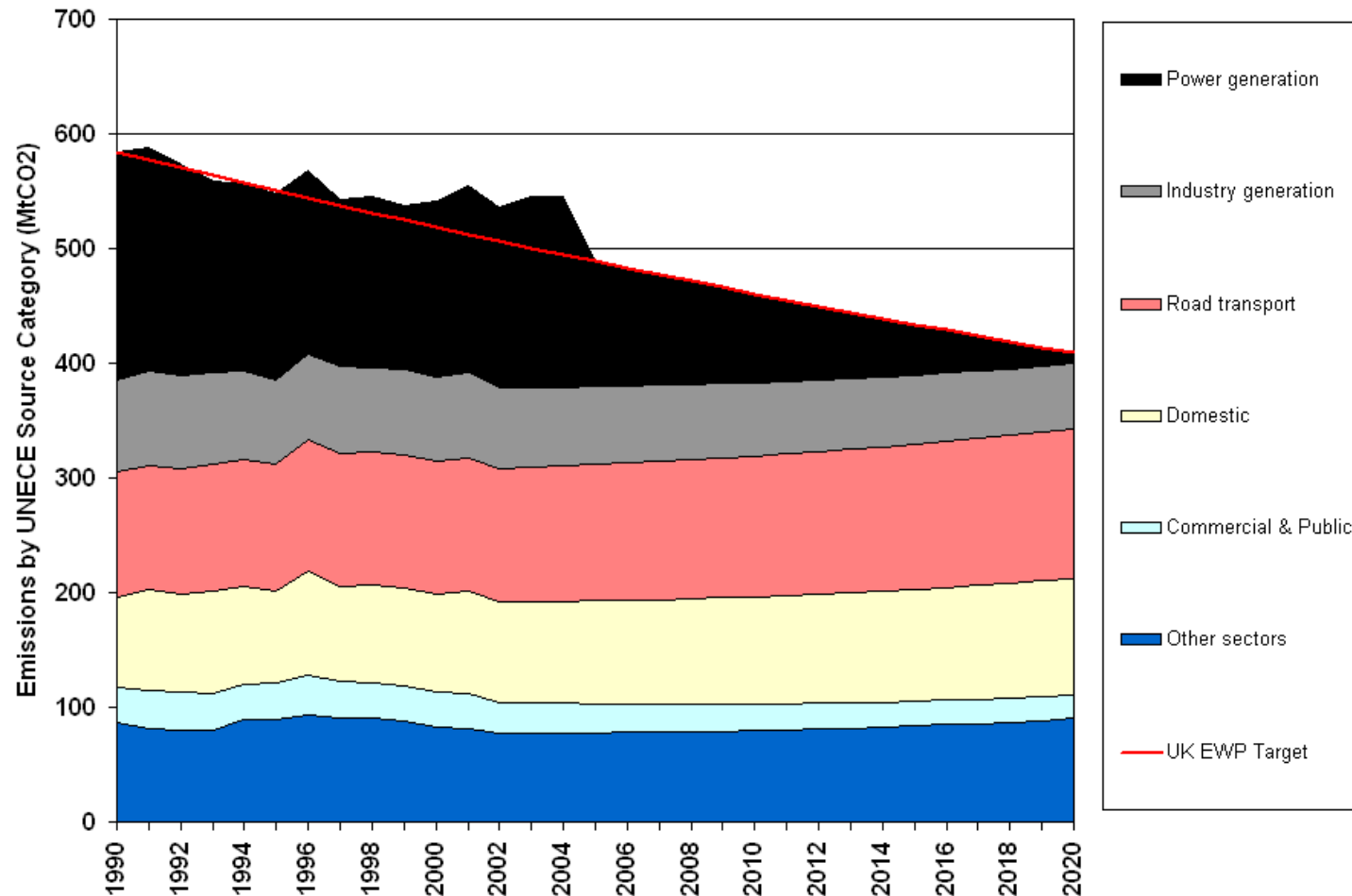
GOALS AND POLICIES

1. Reduce CO2 emissions by 60% by 2050 - REDUCE 30% BY 2020
2. Maintain reliability of energy supplies - DIVERSE OF SUPPLY
3. Promote competitive markets in UK and beyond - LOW PRICES
4. Ensure every home is adequately / affordably heated - LOW PRICES

What the White Paper Implies

... with power generation squeezed between a hard objective and soft implementation...

IMPLIED UK ENERGY POLICY ASPIRATION FOR CO₂ EMISSIONS 1990 - 2020



Source: DEFRA data and author's estimates

.... and many of the UK EWP objectives already or likely to be missed

MISSING THE TARGETS

Electricity – EU ETS price too low to stimulate investment in new CCGT and close coal

Renewables – Target of 20% of electricity generation by 2010 likely to be missed

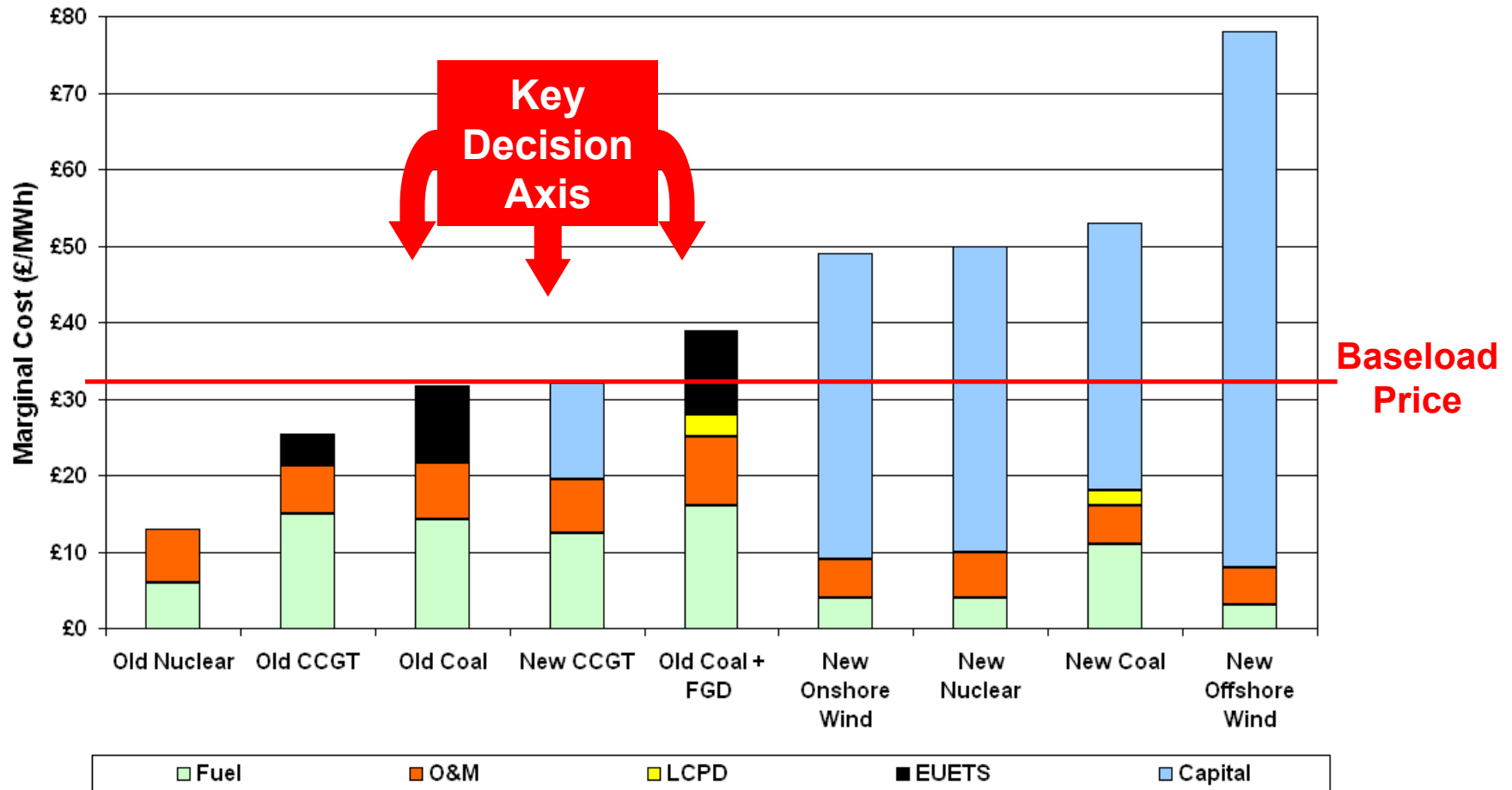
Transport – Target 50% increase in rail travel by 2010 dropped in Transport White Paper

Household – DEFRA admits household energy efficiency target will not be reached

Decision Drivers

At EU ETS **€15/tCO₂** old coal will delay new CCGT entry until LCPD bites in 2011 - 12

EXPECTED MINIMUM MARGINAL COST OF GENERATION IN 2008 - 12

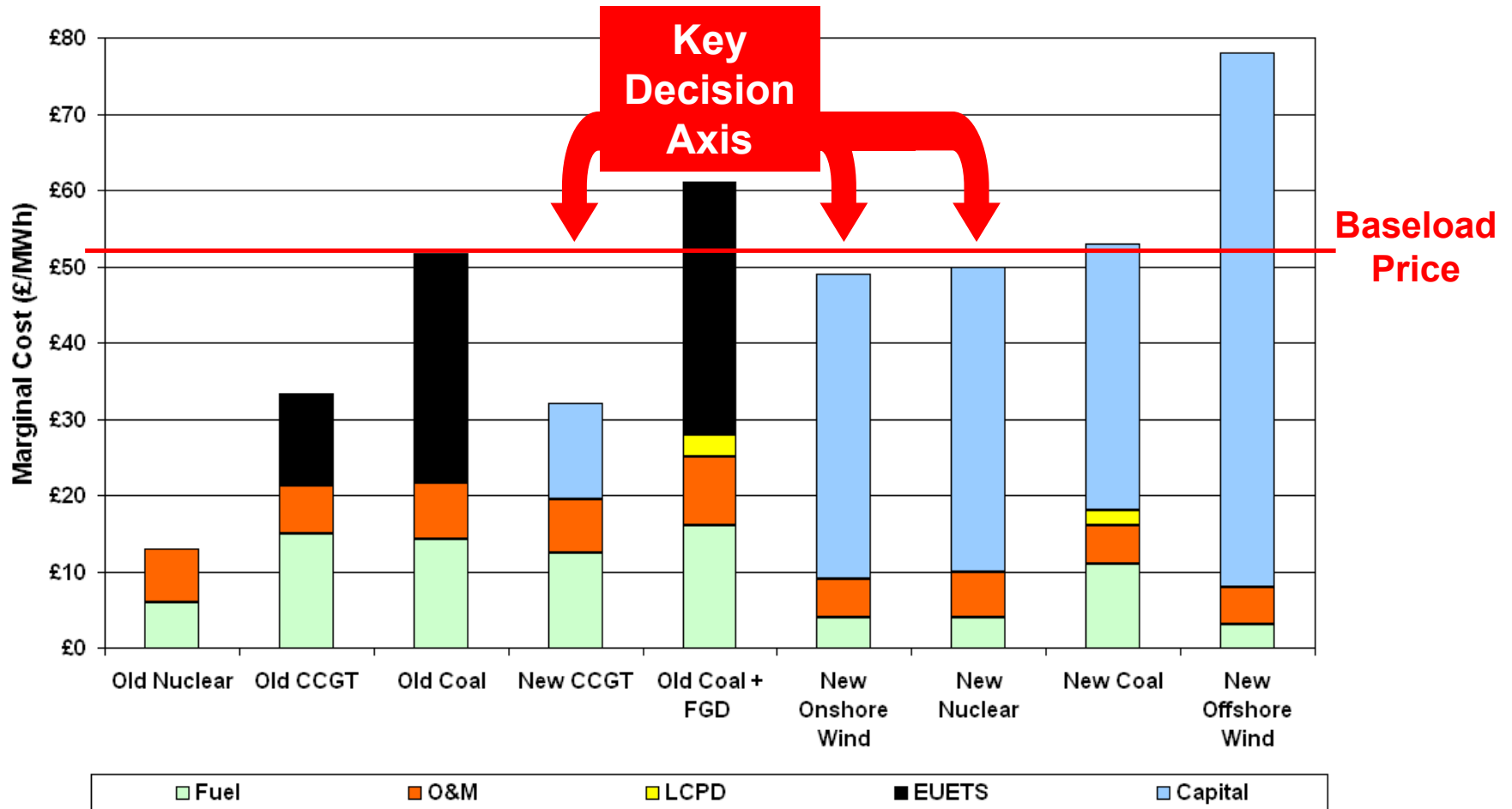


Source: Author's estimates

Decision Drivers

At EU ETS €45/tCO₂ prices spike, dash for gas and CHP/nuclear/onshore wind interest

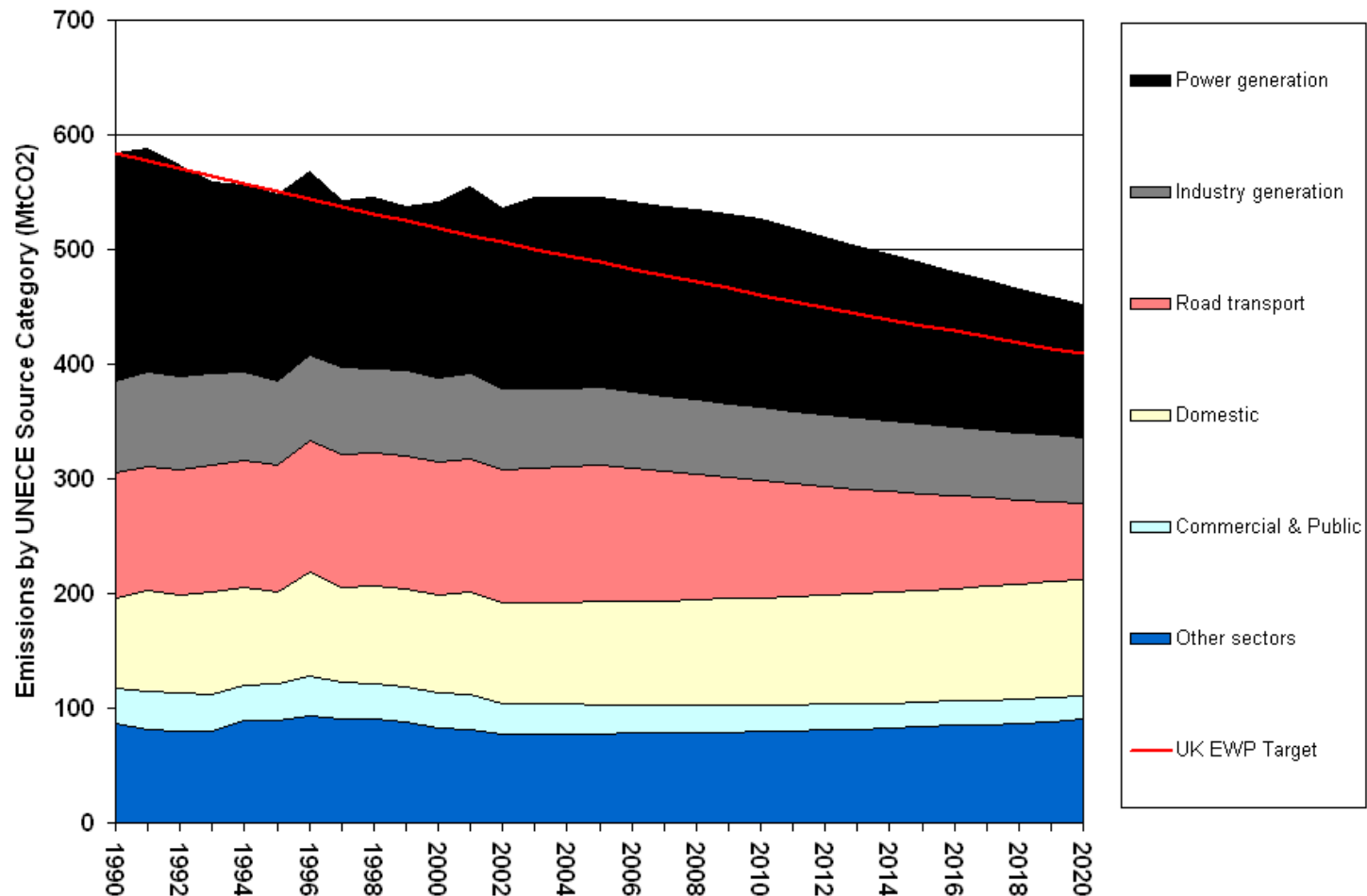
EXPECTED MAXIMUM MARGINAL COST OF GENERATION IN 2008 - 12



Source: Author's estimates

Low CO2 prices mean UK will buy JI/CDM/ETS permits and cut CO2 only 20% by 2020

UK EMISSIONS IN A LOW EU ETS PRICE SCENARIO

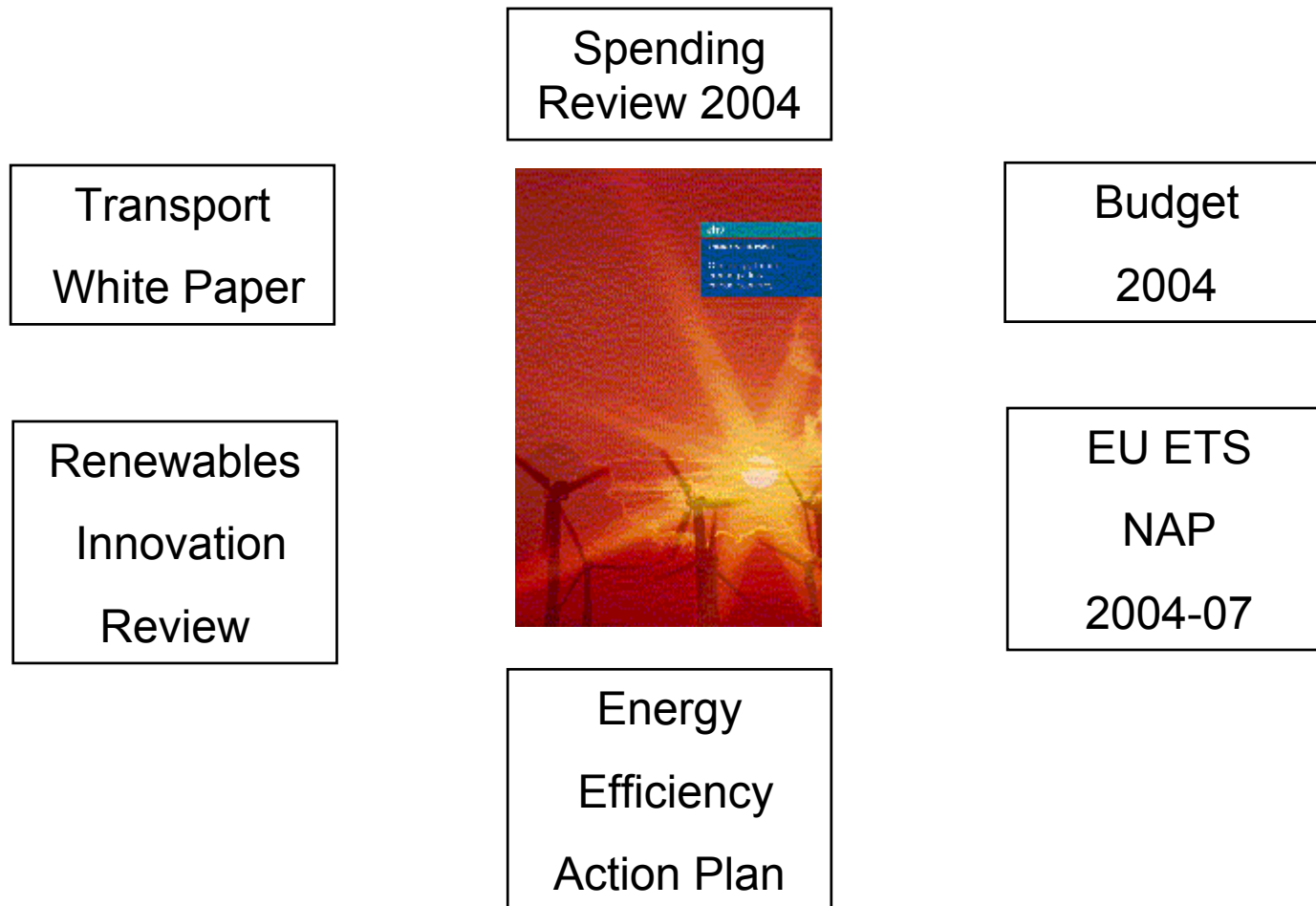


Source: DEFRA data and author's estimates

Future Environmental Taxes?

Government says it has integrated policies to deliver the UK EWP....

SOME RECENT ENERGY POLICY DOCUMENTS



Source: DEFRA data and author's estimates

Future Environmental Taxes?

... even HM Treasury says Energy & Transport taxes are now Environmental taxes but

UK ENERGY TAXES AND PERMITS: IMPLIED MARGINAL CO2 ABATEMENT COST

	Nominal Unit Price	Marginal CO2 Price
EU ETS (2005 mid)	£ 6.00 / MtCO2 on marginal CO2 abated	= £ 6.00 / MtCO2
Electric (CCL + VAT)	£ 7.30 / MWh on domestic 'follow on' units	= £ 10.60 / MtCO2
UK ETS (subsidy)	£15.00 / MtCO2 on all CO2 abated	= £ 17.50 / MtCO2
ROCs (buyout)	£ 30.00 / MWh on marginal unit	= £ 33.30 / MtCO2
Petrol (Duty + VAT)	£ 0.60 / litre on all units supply	= £300.00 / MtCO2

Source: Author's estimates

Future Environmental Taxes?

.... implied marginal CO2 costs and sectoral tax burden shows nothing has really changed

CURRENT UK ENERGY & TRANSPORT TAX REGIME

Current Tax & Duty	Tax & Duty	Emissions	Average Tax	Tax Burden	Emission Burden
	£ million	Million tCO2	£ tCO2	Sector / Total	Sector/Total
Road Fuel Duty	22,476				
VAT on private Road Fuel	2,225	117	251.50	90%	19%
Vehicle Excise Duty	4,724				
Air Passenger Duty	781	28	27.89	2%	5%
International Shipping	0	7	0.00	0%	1%
Other Transport	0	7	0.00	0%	1%
Transport Total Tax	30,206	159	189.97	92%	26%
CCL on electricity	620			2%	
VAT on household electricity	361	165	8.40	1%	27%
ROC buyout	405			1%	
Electricity Total Tax	1386	165	8.40	4%	27%
CCL on natural gas	195			1%	
VAT on household gas	304			1%	
CCL on other fuels	5	279	4.18	0%	46%
VAT on private other fuels	49			0%	
Landfill tax	614			2%	
Other Energy Sector Total Tax	1167	279	4.18	4%	46%
Total UK Proxy CO2 Tax	32 759	603	54.33	100%	100%
Aggregates Levy	350				
Total UK Environment Tax	33 109				

A big economic lever = 8% of UK tax burden

Source: HM Treasury Budget Statement and author estimates

Future Environmental Taxes?

A flat (proxy) £30 tCO₂ tax plus congestion charging could make a real difference...

COMBINED CO₂ TAX & CONGESTION CHARGE REGIME

Proxy £30 tCO ₂ Tax	Tax & Duty	Emissions	Average Tax	Tax Burden	Emission Burden
	£ million	Million tCO ₂	£ tCO ₂	Sector / Total	Sector/Total
Road Fuel Duty	3 000	100	30.00	20%	20%
Jet Fuel Duty	750	25	30.00	5%	5%
Marine Bunker Fuel Duty	150	5	30.00	1%	1%
Other Transport Fuel Duty	300	10	30.00	2%	2%
Total Transport CO₂ Tax	4 200	140	30.00	28%	28%
EU ETS / Fossil Fuel CCL	3 300	110	30.00	22%	22%
Total Power Generator CO₂ Tax	3 300	110	30.00	22%	22%
Industry Fossil Fuel CCL	1 050	35	30.00	7%	7%
Industrial Power Fossil Fuel CCL	2 700	90	30.00	18%	18%
Commercial Public & Ag CCL	600	20	30.00	4%	4%
Household Fossil Fuel CCL	2 400	80	30.00	16%	16%
Other Fossil Fuel CCL	750	25	30.00	5%	5%
Total Other Sector CO₂ Tax	7 500	250	30.00	50%	50%
Total UK Proxy CO₂ Tax	15 000	500	30.00		
Total UK Other GHG Tax	1 800	60	30.00		
Total UK Climate Change Tax	16 800	560	30.00		
Motorway Congestion (net)	10 000	@ £0.20 per vehicle km at peak hours less £1.5 billion cost			
Urban Congestion (net)	7 800	@ £5.00 per vehicle per day entering an urban area less £1 billion cost			
Airspace Congestion (net)	1 500	@ £1500 per take off and landing in peak hours from main UK airports			
Total UK Congestion Charges	19 300				
Total UK Environment Tax	36 100				

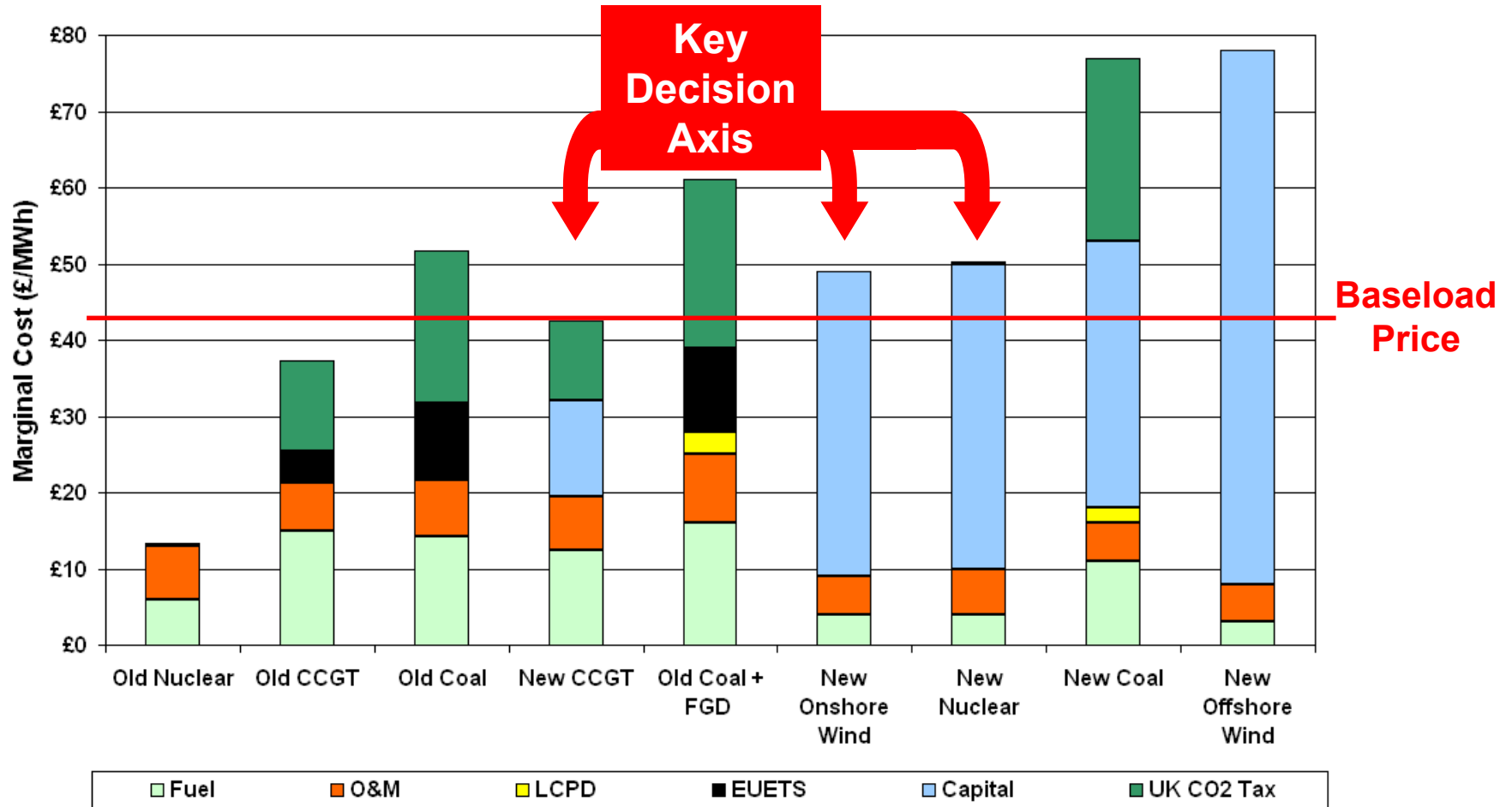
A bigger and better economic lever!

Source: HM Treasury Budget Statement and author estimates

Future Environmental Taxes?

.... because new CCGT and economically viable renewables would quickly replace coal

IMPACT OF EUETS + CO2 TAX ON MARGINAL COST OF GENERATION IN 2008 - 12



Source: Author's estimates

Future Environmental Taxes?

Little change to duty / tax collection infrastructure required – so quick implementation

IMPLEMENTATION

TAX	ACTION	TAX RATE
Transport Fuel Duty	Applied at UK mainland entry point	£110 per tC content of fuel
VAT, VED, APD	Cancelled	Zero
CCL, RO (Electric)*	Cancelled	Zero
CCL (Coal, gas, oil)**	Applied at UK mainland entry point	£110 per tC content of fuel
Motorway Congestion	Applied as per M6 toll	£0.20 per km at peak
Urban Congestion	Applied as per London	£5.00 per day at peak
Airspace Congestion	Applied at each landing / take off	£1500 per plane at peak

* Consumers pay indirectly via tax on generation input fuel and Suppliers rebated for ROCs purchase costs

* Generators/CHP/Waste/Industry pay £110 tC content of fuel but rebate for EUAs bought in up to £30 tCO₂ limit

Source: Author's estimates

Energy intensive industry and airlines bear a fair share of CO2 tax and 'fuel poor' pay less

POLITICS

CONSUMER GROUPS (Lobbyists)

Car Driver	Motorway commuters in big cars pay more – others same or less
Truck Operator	Pay less for fuel and about same for tolls as EU competitors
Airline Passenger	Pay much more on short haul at peak but same long haul off peak
Domestic User	Cancelling VAT and increasing social payments offsets price rise
Industrial User	Some big power, gas, coal users may exit but big rise in CHP
Commercial User	Increase in heating costs will be offset by falling transport costs

SOCIAL GROUPS (Voters)

Rural poor	Pay much less for car use / get social security offset for heating
Urban poor	Better public transport / get social security offset for heating
Middle Income	Small net benefit as lower car costs offset rise in heating bills

John Bower is a Senior Research Fellow at the Oxford Institute for Energy Studies which is an independent research charity affiliated to Oxford University and dedicated to advanced research in the social science aspects of energy. John joined OIES in November 2001 and his research interest is in the emergence and evolution of integrated cross-border electricity and gas markets. Specifically; the development of efficient pricing and investment mechanisms for energy, transmission capacity, and emissions.

Before joining the OIES, John completed his PhD at London Business School and his previous career was in the commodity industry. His experience ranges from energy trading, at Marc Rich & Co, to risk management consultancy, with Coopers & Lybrand, advising commodity traders, producers and processors in base metal, precious metal, 'softs' and energy markets. Immediately prior to his PhD he was Global Controller Metals/Commodities at Deutsche Morgan Grenfell.



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