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**UK schemes for reducing carbon emissions from electricity and elsewhere**

**UK CARBON EMISSIONS POLICY OPTIONS AND EU POLICY CONFERENCE**

***London Business School***

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**What the White Paper Said**

**Reality Dawns**

**An alternative 20:20 Vision**

UKEWP refocused energy policy away from a UK driven liberalisation agenda...

## GOALS AND POLICIES

### 1. Reduce CO2 emissions by 60% by 2050 – IMPLIES 30% BY 2020

- Reduce amount of energy we consume
- Central to future market and policy will be emissions trading
- Raise efficiency standards in home appliances and housing
- Encourage low carbon fuels and renewables through grants and subsidy

### 2. Maintain reliability of energy supplies – IMPLIES DIVERSITY OF SUPPLY

- Right infrastructure / regulatory systems in UK and liberalisation of Europe
- Pursue regional stability and economic reform in producing areas
- Promote understanding of markets and conditions for FDI in producing areas
- Forward prices will signal the need for investment
- Improve contingency planning in dealing with major incidents

.... towards an EU driven multifaceted agenda

## GOALS AND POLICIES

### 3. Promote competitive markets in UK and beyond – IMPLIES LOW PRICES

- Raise rate of sustainable economic growth
- Support business and competitiveness through reliable / affordable energy
- Encourage firms to innovate, reduce cost, deliver better goods and services
- Use market based instruments to deliver policy goals
- Work with business to prepare them for the low carbon economy of the future

### 4. Ensure every home is adequately and affordably heated – IMPLIES LOW PRICES

- Reduce poverty by lowering prices and raising social security payments
- Improve quality of housing stock via insulation and energy efficiency grants

However political risk and planning uncertainty remain – TISC and Lords voicing concern

## A SHIFT IN EMPHASIS OR A MAJOR RETHINK?

“Britain's future energy mix will be dominated by **gas power** generation with **nuclear power** likely to make a comeback and **renewables only playing a limited part**”

“I wouldn't put much money on there being much of a **coal generation** element by 2015.”

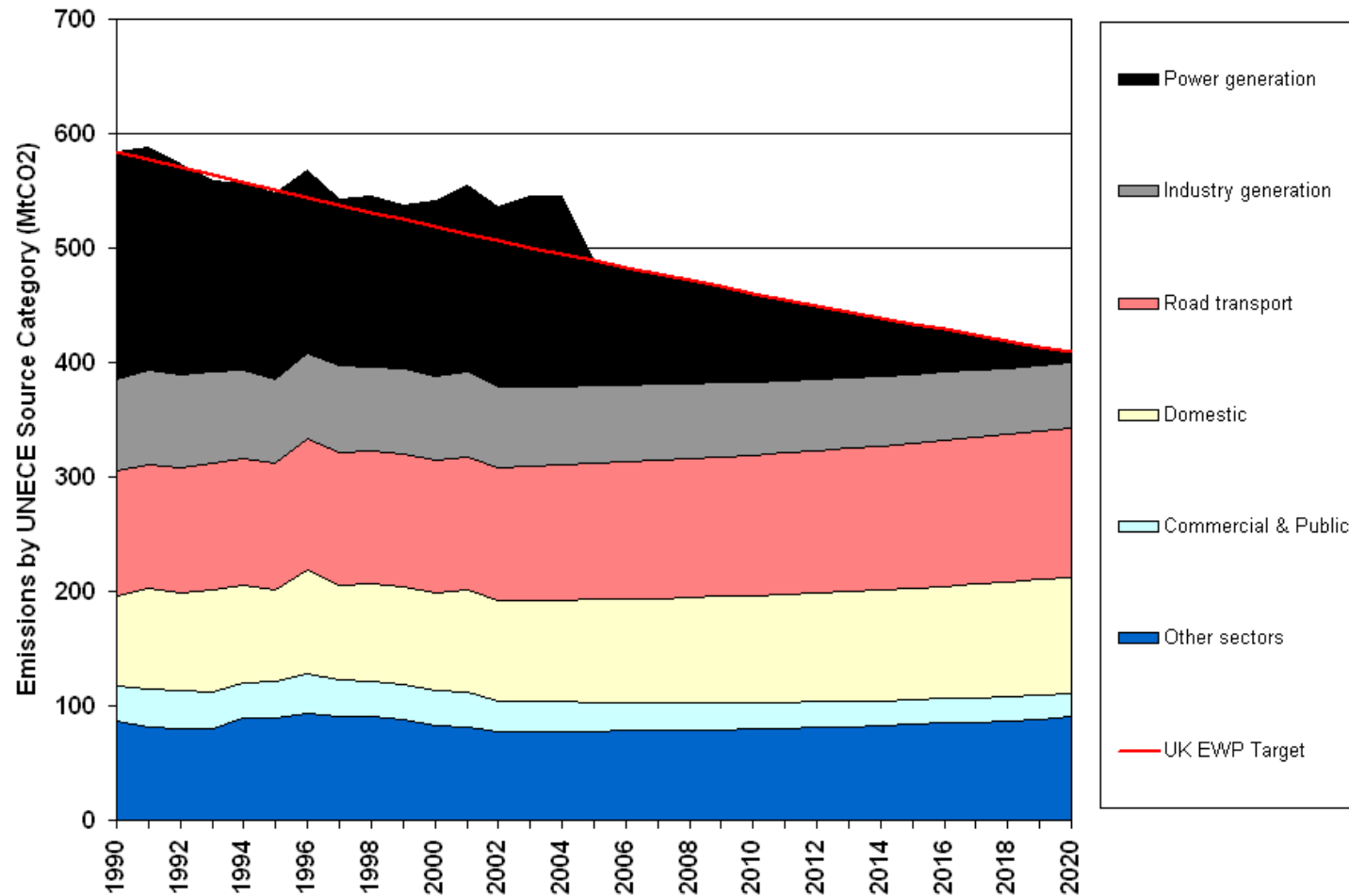
“The emergence of **carbon trading** will slightly penalise gas, but it will punish coal, and it **could begin to favour nuclear**“

**“Renewables will be limited -- nuclear will come back”**

Source: Martin O'Neill, Chairman of the UK Parliament's Trade and Industry Select Committee. 29 September 2003

Power generation is squeezed by hard policy objective and soft policy implementation

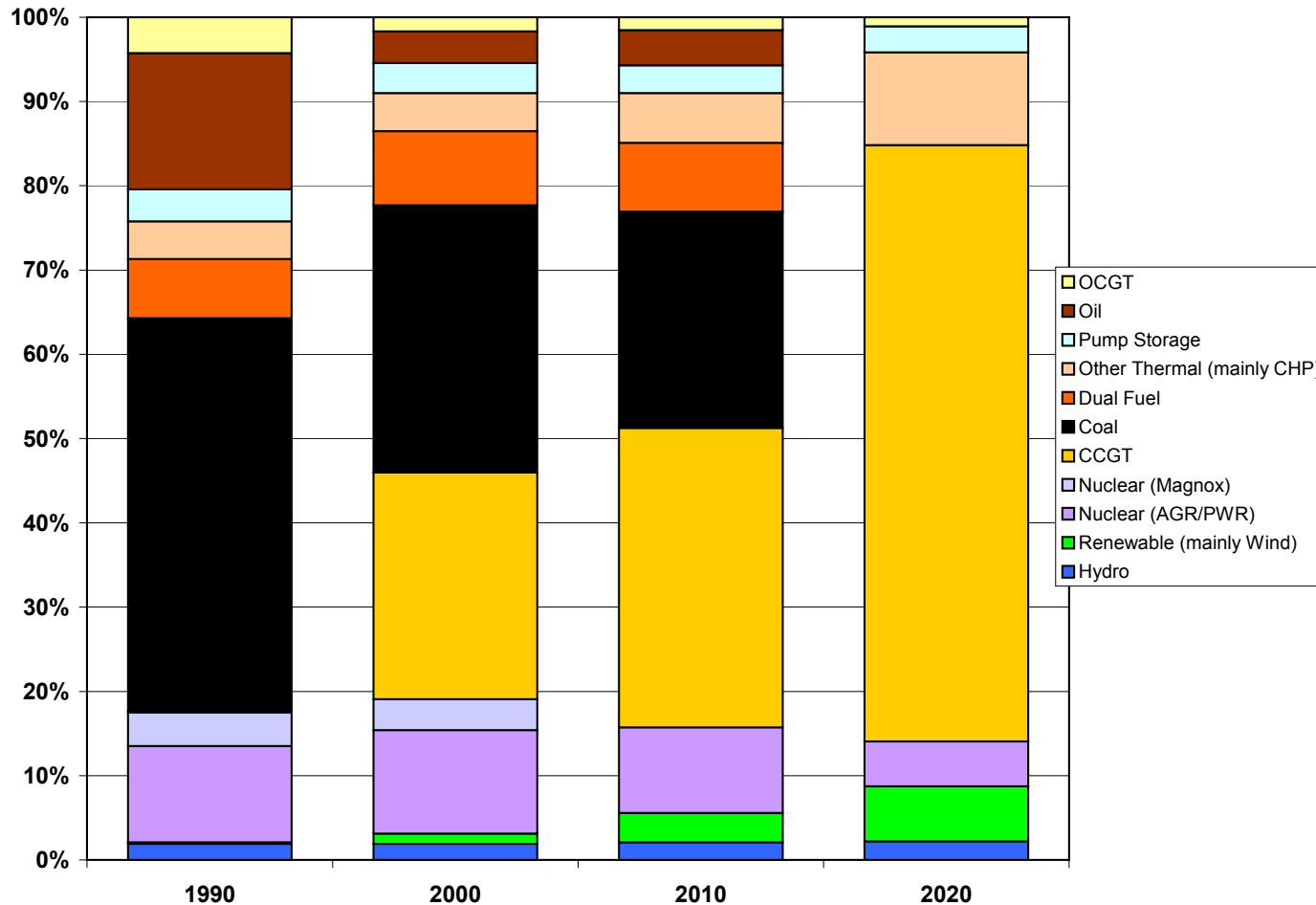
## IMPLIED UK ENERGY POLICY ASPIRATION FOR CO<sub>2</sub> EMISSIONS 1990 - 2020



Source: DEFRA and author's estimates

An aggressive CCGT investment programme is required but price signals not clear....

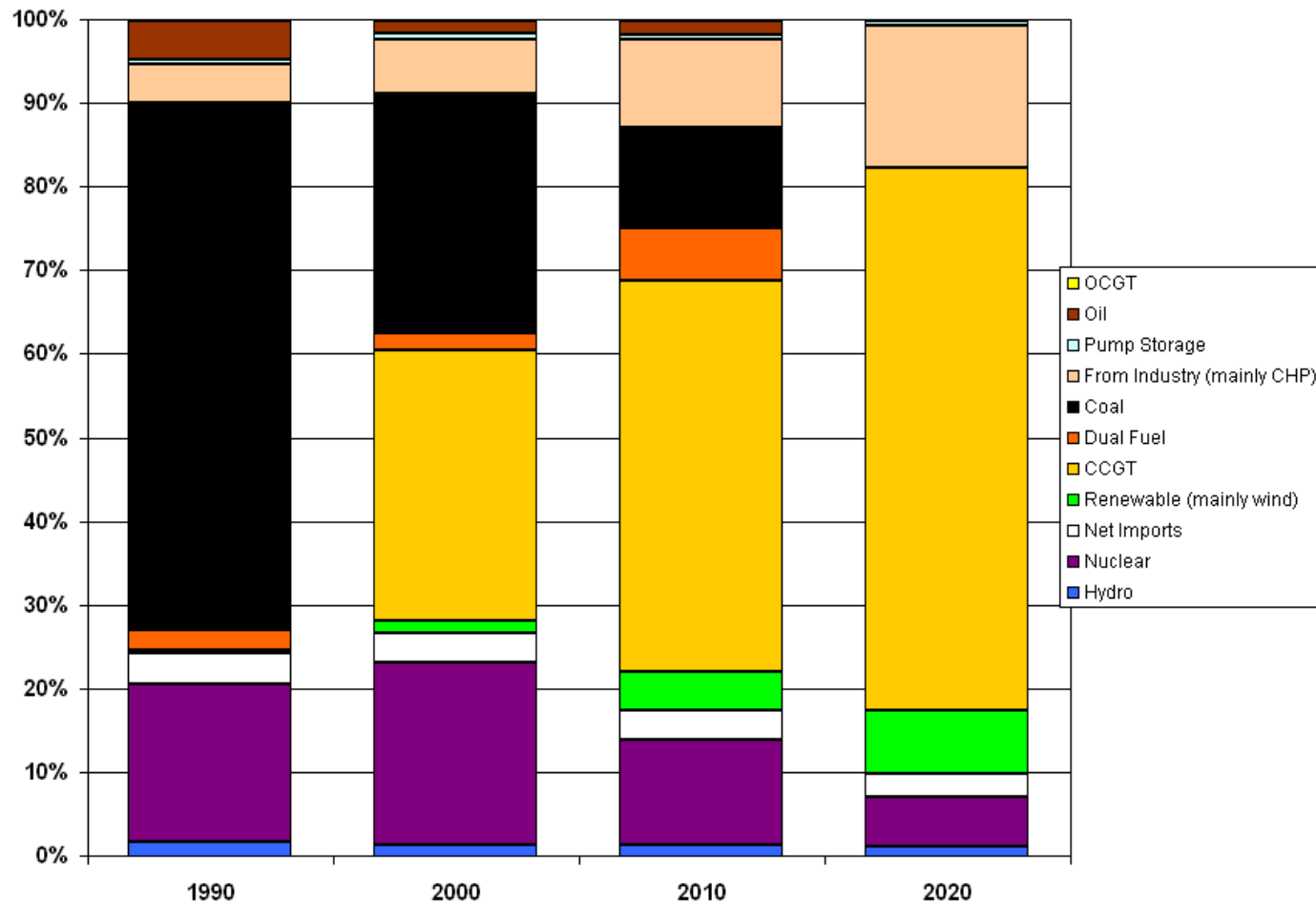
## ACTUAL AND LIKELY FUTURE PLANT MIX 1990 - 2020



Source: DEFRA and author's estimates

.... and renewables output will struggle to reach 10% of total but rapid growth in CHP

### ACTUAL AND LIKELY FUTURE OUTPUT MIX 1990 - 2020

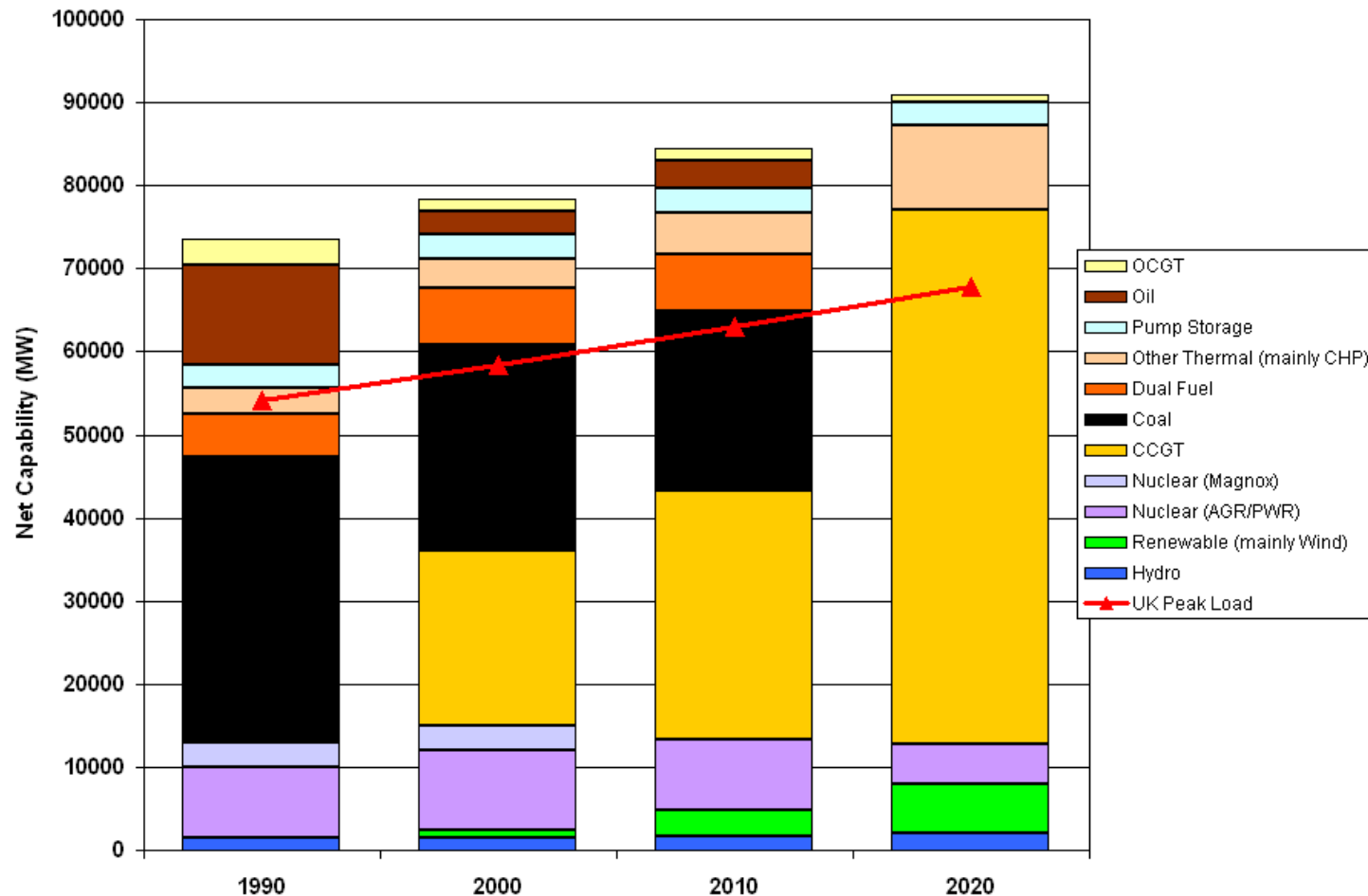


Source: DEFRA and



However demand growth will undermine attempts to cut emissions in power generation...

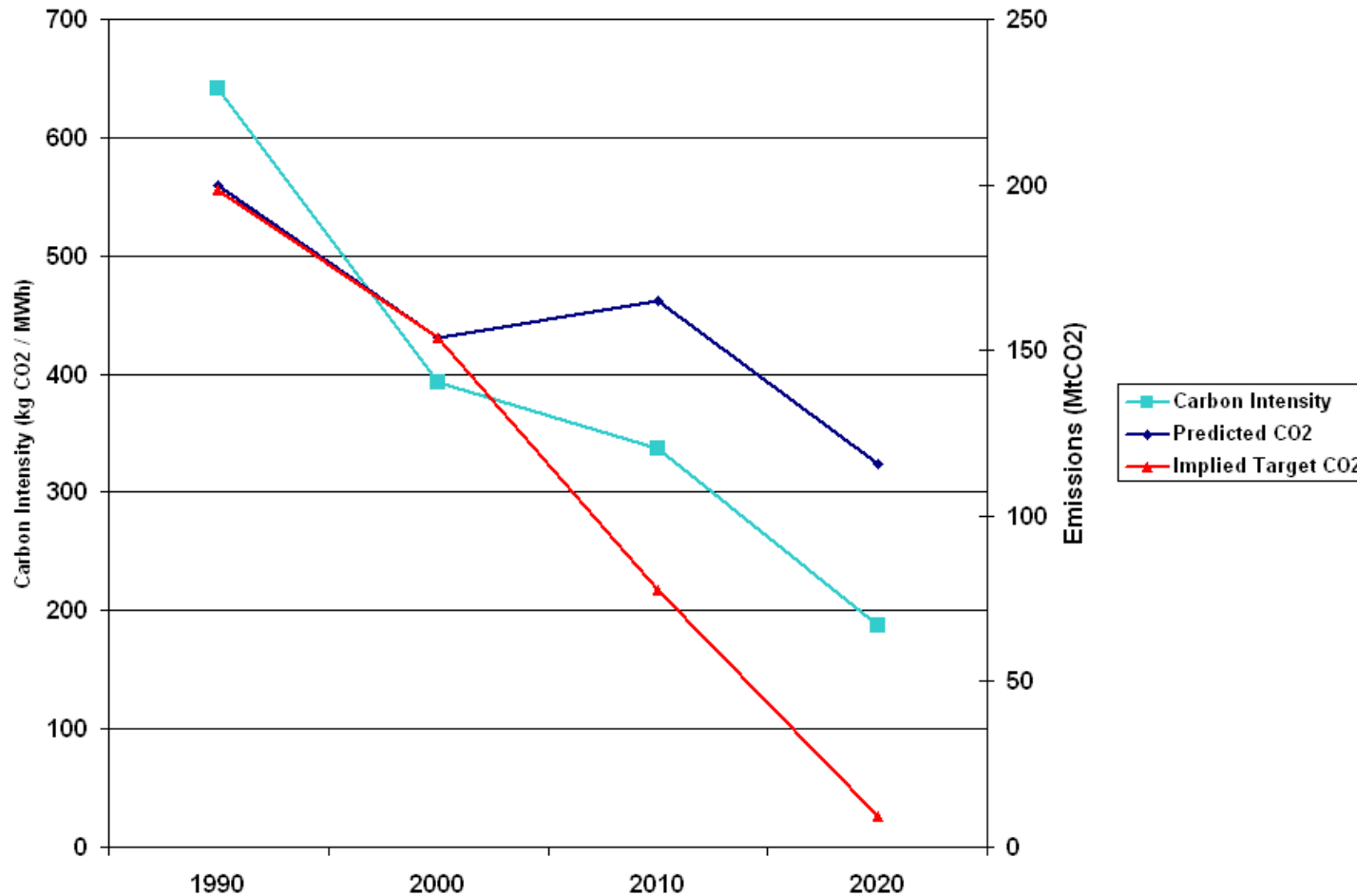
## ACTUAL AND LIKELY FUTURE PLANT MIX 1990 - 2020



Source: DEFRA and author's estimates

.... so it will never be able to deliver the entire burden of CO2 emission reduction

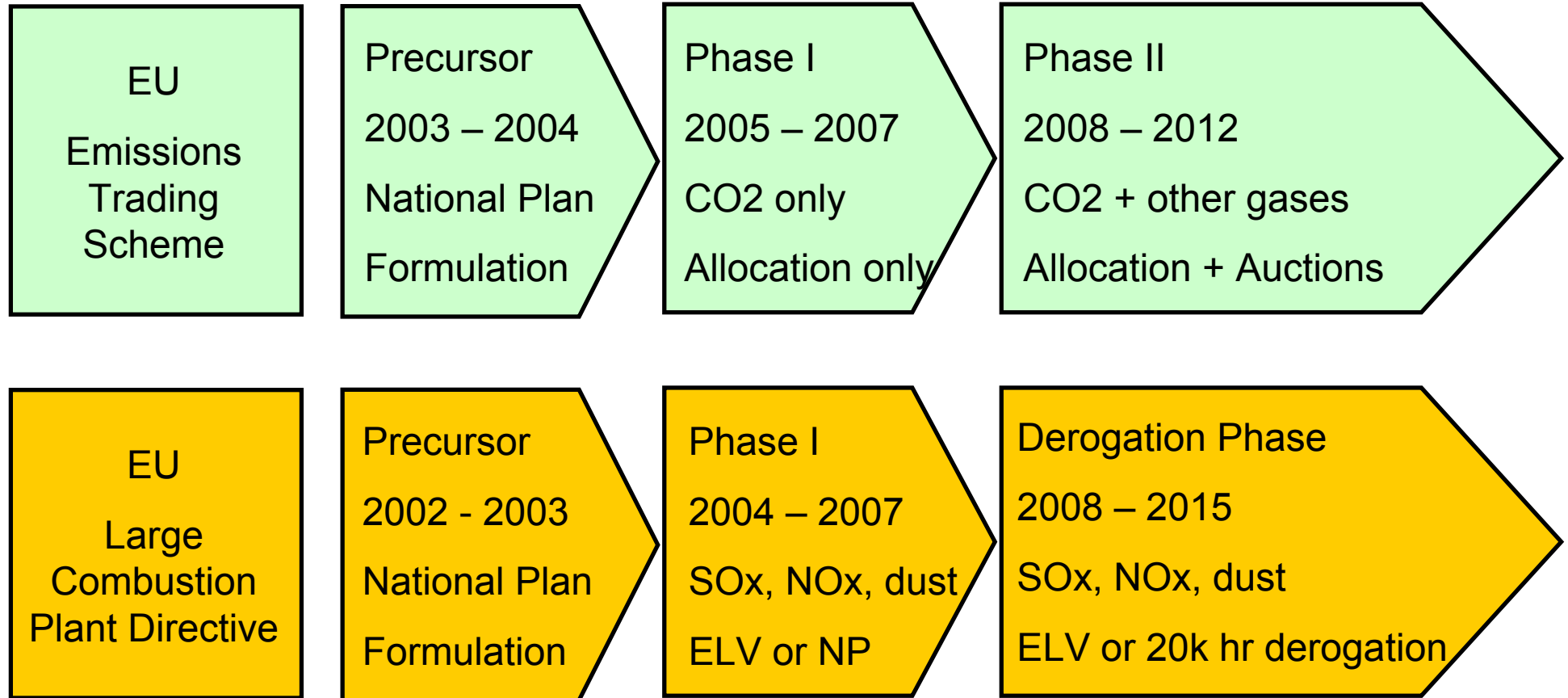
## ACTUAL AND LIKELY FUTURE POWER SECTOR EMISSIONS AND INTENSITY 1990 - 2020



Source: DEFRA and author's estimates

Energy policy in power generation is really being driven by EU ETS and LCPD....

## EU EMISSIONS TRADING SCHEME AND LARGE COMBUSTION PLANT DIRECTIVES



.... with current UK schemes indicating wildly varying marginal CO2 abatement cost

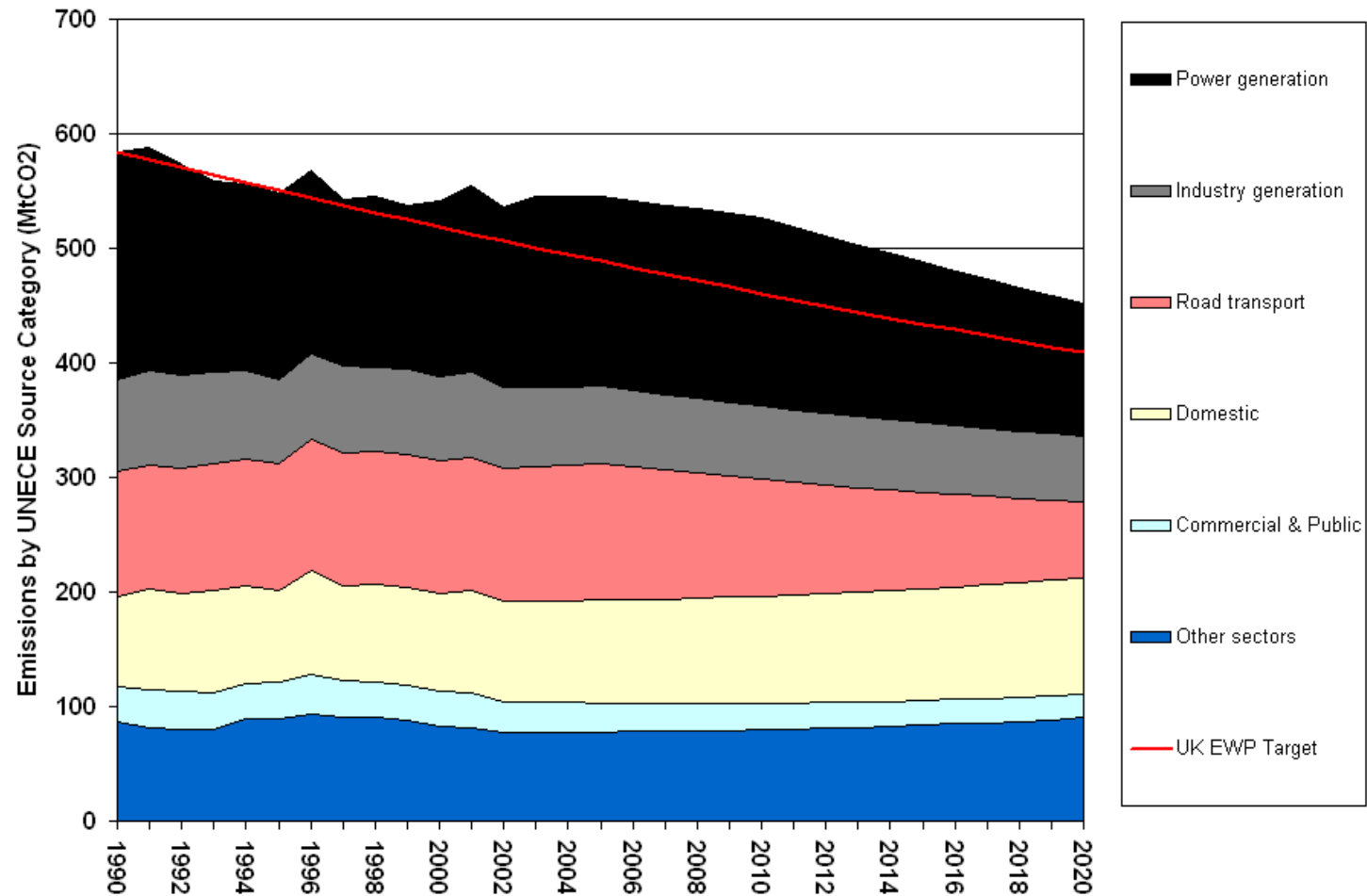
## IMPLIED MARGINAL VALUES OF CO2 EMISSIONS FROM POWER GENERATION

EU ETS	£ 5.50 / MtCO2 abated	= £ 5.50 / MtCO2
CCL	£ 4.30 / MWh supplied	= £ 6.50 / MtCO2
VAT (Household)	£ 4.50 / MWh supplied	= £ 6.75 / MtCO2
UK ETS	£15.00 / MtCO2 abated	= £17.50 / MtCO2
ROCs	£40.00 / MWh supplied	= £45.00 / MtCO2

Source: Author's estimates

Pragmatic solution is to buy JI/CDM credits as well as EU ETS permits

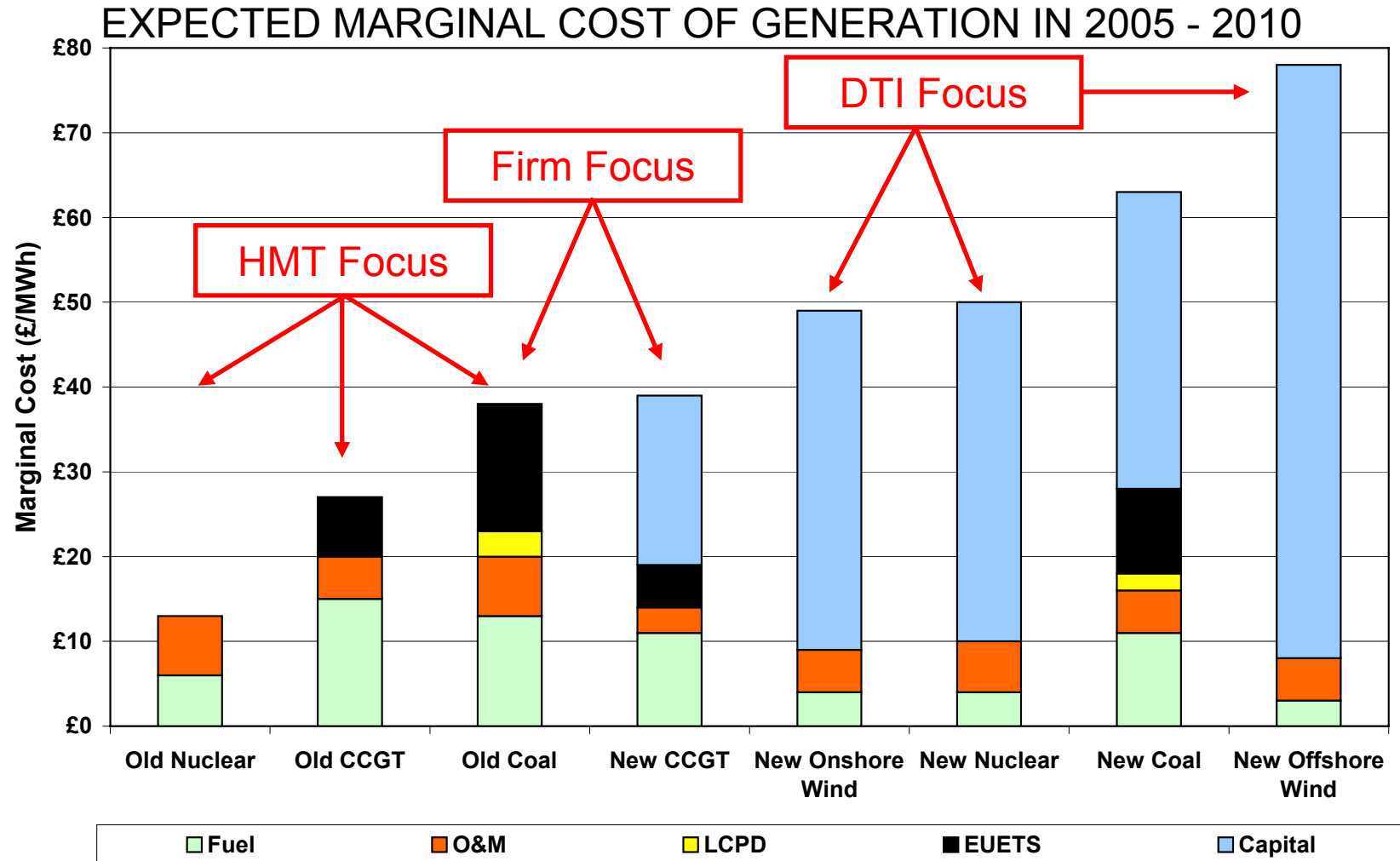
## PRAGMATIC SOLUTION TO UK EMISSIONS



Source: DEFRA and author's estimates

# An Alternative 20:20 Agenda

The value of CO2 abatement will not cover renewable build costs until after 2020...



Source: Author's estimates. See also [www.oxfordenergy.org](http://www.oxfordenergy.org) Oxford Energy Comment "UK Offshore Wind Generation Capacity: A Return to Picking Winners"

.... but road transport CO<sub>2</sub> could be cut with a fiscal incentive to switch to DERV

## EMISSION FACTORS FOR PETROL AND DERV

	<b>PETROL</b> kg CO <sub>2</sub> equivalent emissions / km	<b>DERV</b> kg CO <sub>2</sub> equivalent emissions / km
Small Car 2.0 litre or under	0.22	0.12
Large Car 2.0 litre or over	0.25	0.14
Average Car	0.20	0.12

Source: DEFRA

**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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