



CENTRE FOR POLICY STUDIES

# **A GREEN BUDGET?**

A NOTE FOR THE 2007 BUDGET

**Ruth Lea**

## THE AUTHOR

Ruth Lea is Director of the Centre for Policy Studies and of Global Vision. She is a Governor of the London School of Economics and is a non-Executive Director of the Arbuthnot Banking Group. She has served on the Council of the Royal Economic Society, the National Consumer Council, the Nurses' Pay Review Body, the ONS Statistics Advisory Committee, the ESRC Research Priorities Board and the Retail Prices Advisory Committee. She was Head of the Policy Unit at the Institute of Directors (IoD) from 1995 to 2003 before which she was the Economics Editor at ITN, was Chief Economist at Mitsubishi Bank and Chief UK Economist at Lehman Brothers. She also spent 16 years in the Civil Service in the Treasury, the Department of Trade and Industry and the Central Statistical Office.

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Centre for Policy Studies  
57 Tufton Street, London SW1P 3QL  
Tel: 020 7222 4488 Fax: 020 7222 4388  
e-mail: [mail@cps.org.uk](mailto:mail@cps.org.uk) website: [www.cps.org.uk](http://www.cps.org.uk)

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# CONTENTS

CHAPTER 1 INTRODUCTION AND SUMMARY	1
CHAPTER 2 ECONOMIC BACKGROUND: THE CHANCELLOR'S LEGACY	4
CHAPTER 3 FISCAL TRENDS: STILL POOR	9
CHAPTER 4 CLIMATE CHANGE AND "GREEN TAXES": BACKGROUND	13
CHAPTER 5 A GREEN CHANCELLOR?	25
ANNEXES	



# CHAPTER ONE

## **INTRODUCTION AND SUMMARY**

### **1.1 INTRODUCTION**

In the run-up to the Chancellor's eleventh, and assumed to be his last, Budget, three themes are emerging:

- What will the Chancellor's economic legacy be after his 10 years at the Treasury? This is discussed in chapter 2.
- What will he tell us about the spending plans for financial years 2008/09 to 2010/11, the details of which are due to be released in July in the next Comprehensive Spending Review (CSR)? This issue is considered in chapter 3. This chapter also looks at the state of the public finances, concluding that the Chancellor has very little scope for any tax give-aways.
- Of possibly the greatest political interest is how the Chancellor will respond to the sharp rise of interest, stimulated by the Opposition leadership, in saving the planet from global warming. Will this be a Green Budget given by a Green Chancellor? Chapter 4 provides analysis of the green debate and chapter 5 looks at the Government's green policies and the scope for the Chancellor to be a green Chancellor.

### **1.2 THE ECONOMIC BACKGROUND: THE CHANCELLOR'S LEGACY**

A previous CPS paper<sup>1</sup> looked at the economic record of the Chancellor and concluded that even though the economy had grown well since 1997, the productivity performance had been poor; and that there had been an over-reliance on the expansion of the labour force for growth – not least of all from immigration. In addition, there had been no damaging “boom and busts”.

Much of the credit for this had to do with the performance of the Bank of England to which the Chancellor, rightly, transferred interest rate decisions in May 1997.

But, given, the “Golden Legacy”<sup>2</sup> that he had inherited from the previous Conservative administration, there are many disappointments (in addition to the poor productivity record). The balance of payments data have deteriorated alarmingly, international competitiveness has been undermined and, most seriously of all, the public finances (which were heading for surplus in 1997) are in a poor shape. After 13 years of growth, this is unimpressive.

### **1.3 FISCAL TRENDS: STILL POOR**

Even though the deficit on the Public Sector Current Balance should show a further fall in FY2006, reflecting higher taxes, Public Sector Net Borrowing remains at around £40bn. On the assumption that the Chancellor would want to shore up his revenues at this stage of the electoral cycle, his scope for tax “lollypops” is very limited in this Budget.

Doubtless the Chancellor will announce that both of his fiscal rules are in rude good health. The “golden rule” will probably be met and the debt to GDP ratio is still below 40%.

The public spending projections for FY2008 to FY2010 that have already been pencilled in are very tight. The Chancellor is expected to emphasise his “toughness” (presaged by the recent below-inflation pay deals for some public sector employees), whilst still giving the impression of generosity to education. These tight increases will be all the more painful as they have followed seven years of rapid increases in spending which have of course, been accompanied by a very significant increase in the tax to GDP ratio (by FY2008 the Treasury calculates that that Tax/GDP ratio will be 38%). Tax/GDP ratios are heading back to the levels last seen in the mid 1980s.

### **1.4 CLIMATE CHANGE AND “GREEN TAXES”: BACKGROUND**

Chapter 4 discusses the policy background to green taxes. Rarely has an issue so rapidly risen up the political ranks as the need to “manage” climate change by controlling Greenhouse Gas (GHG) emissions, in particular CO<sub>2</sub> emissions from fossil fuels. There are many sub-issues involved. Briefly the conclusions are:

- The majority view is that the earth will probably continue to warm in the 21<sup>st</sup> century – though some climate scientists challenge this.
- Projecting temperature change until the end of the 21<sup>st</sup> century is fraught with problems. Economic forecasts are very uncertain over this period of time and the climate system is notoriously difficult to model. The IPCC’s latest projections of warming by the end of the century lie between 2° C and 4.5° C. They must be treated with extreme caution.
- Any analysis of the impacts of climate change requires a thorough cost-benefit analysis. Unfortunately, the Stern Review’s analysis is flawed.

- There are two basic responses to climate change: adaptation and mitigation. The UN's preferred response is mitigation by attempting to "control climate change" by cuts in carbon emissions.
- The UN approach assumes that anthropogenic carbon emissions are a (if not the) major cause of climate change. Many scientists challenge this view.
- The UN approach assumes that drastic cuts in carbon emissions will "control climate change". This is dubious. Carbon cuts could even result in warming.
- The UN's Kyoto process of curbing carbon emissions has, to date, been ineffectual. The US, Australia, China and India have effectively not been involved and many of the EU countries have effectively ignored it. It will probably remain ineffectual.

The chapter concludes that, whilst the science of climate change is very uncertain,<sup>3</sup> there are nevertheless two sound reasons for trying to reduce the use of fossil fuels. The first is that, as the science is uncertain, so are the risks of unrestricted carbon emissions. And an "insurance" policy of curbing the growth of carbon emissions is sensible, providing it is cost effective.<sup>4</sup> The second is for reasons of energy security. As the UK's reserves of natural gas and North Sea oil become depleted, it is sensible to consider other forms of power for electricity generation and transport.

There is a reasonable coincidence of interests between cutting carbon emissions for climate change reasons and improving security of energy supply.

### **1.5 A GREEN CHANCELLOR?**

With green issues high on the political agenda, there will doubtless be considerable pressure on the Chancellor to further raise the total level of receipts from green taxes. But there are draw backs. Taxpayers are sceptical about the claims that they are truly environmental and, within the existing framework of tax options, the scope to raise significant sums of money is fairly limited unless above-inflation rises in fuel duty rates are once again enacted. Given the 2000 fuel protests this is unlikely.

However, the Chancellor is likely to bring in extra green policies, even if they are interpreted as little more than political tokens. Speculations include: reduced VAT rates for energy efficient household appliances and cars and higher VAT rates for the worst energy consuming goods and cars, higher duties on petrol/diesel and incentives for green energy generation.

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# CHAPTER ONE

## **ECONOMIC BACKGROUND: THE CHANCELLOR'S LEGACY**

### **2.1 INTRODUCTION**

The economic section of the Budget is unlikely to be of great interest this year. The economy is growing quite well and inflation, despite the recent spikes in inflation rates, seems reasonably under control.

Superficially the economy's performance since 1997 has looked satisfactory, but the productivity performance has been poor and there has been an over-reliance on the expansion of the labour force for growth – not least of all from immigration.

### **2.2 THE ECONOMIC FORECASTS**

The main components of the Chancellor's 2006 PBR forecasts are set out in the table below.

#### **THE CHANCELLOR'S PBR FORECASTS**

	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
GDP at constant market prices (%)*	1¾	2¾	2¾ to 3¼	2½ to 3	2½ to 3
Balance of payments (current account, £bn)	-27½	-32	-37½	-38¾	-40¾
CPI (Q4) (%)*	2¼	2½	2	2	2
Money GDP (£bn)	1224½	1287½	1360-1366	1431-1445	1505-1526
Money GDP (%)*	4	5¼	5¾ to 6	5¼ to 5¾	5¼ to 5¾

\* Change year-on-year (%). The CPI forecast refers to the year-on-year change for the 4<sup>th</sup> quarter average.

Source: HM Treasury, *Pre-Budget Report: investing in Britain's potential: building our long-term future*, Cm 6984, 2006.



GDP growth is currently expected to be 2.7% for 2006 –close to the PBR forecast. The Treasury’s GDP forecasts for both 2007 and 2008 are, however, slightly optimistic side compared with Consensus.

### **CONSENSUS FORECASTS FOR THE BRITISH ECONOMY**

	<b>2006</b>	<b>2007</b>	<b>2008</b>
GDP (%)*	2.7	2.6	2.4
CPI (%)*	2.7	2.0	2.0
Balance of payments†	-35.6	-38.1	-40.6
3 month interbank rate (%)	5.3	5.6	5.3
	(year end)	(end May 2007)	(end February 2008)

\* Change year-on-year (%). The CPI forecast refers to the year-on-year change for Q4.

† Current account, £bn. Figure for 2006 is an estimate.

Source: Consensus Economics, *Consensus Forecasts*, February 2007.

The Chancellor’s economic forecasts and projections are relevant to the public finances. The GDP growth projections used for the public finances are the “bottom of the range” data for trend output growth. They are 2¾% to end 2007, slowing to 2½% thereafter due to demographic effects.

### **2.3 GORDON BROWN’S LEGACY**

As this is almost certainly going to be Gordon Brown’s final Budget some of the interest surrounding this Budget will be probably about his legacy.

Our paper on the 2006 Pre-Budget Report contained an analysis of the overall performance of the economy over the last decade and concluded:<sup>1</sup>

- The economy had performed quite creditably since 1997. There had been no damaging “booms and busts” and annual GDP growth had averaged about 2.8%. Much of the credit had to do with the performance of the Bank of England to which the Chancellor, rightly, transferred interest rate decisions in May 1997.
- But the productivity performance has disappointed, with an annual average growth of less than 2%. Indeed productivity growth under Brown had slowed. Given that improved productivity performance had been a key Treasury objective, then the deterioration in productivity growth could only be regarded as a complete policy failure.
- One of the reasons for the poor overall performance was the abysmal performance of the public sector where, in many sectors, productivity was falling.
- GDP as an indicator of living standards was, however, inadequate. GDP per capita was a better indicator as it made allowance for a rising population – it had probably grown by less than 2½% since 1997. In addition, when the increased tax take was taken into consideration, the picture on living standards became even less rosy. Households Real Personal Disposable Income (RPDI) had been depressed by higher taxes. It had actually fallen back in the first quarter of 2006.

- Large-scale immigration has undoubtedly bolstered GDP growth and, arguably, offset the weakening productivity performance. But the impact on GDP per capita could be neutral – at best.
- Damagingly, there was ever-increasing evidence that the UK's competitiveness was slipping down the international league tables.
- The balance of payments had deteriorated alarmingly.

Since the PBR, further evidence suggests an economy that superficially prospers while the building blocks for future prosperity, including the contributors to competitiveness, look much less healthy. This includes:

- Data published by the ONS showed that the UK's position was, if anything, deteriorating against the other G7 countries.<sup>2</sup>
- The British Chambers of Commerce released their 2007 Business Barometer of the cost of regulations, which showed that the cumulative cost of regulation since 1998 had risen to £55.6bn.<sup>3</sup>
- A report by business consultants Curzon and Company, covering the results of a detailed survey of over 250 international executives, warned of the falling attractiveness of Britain as a place to do business.<sup>4</sup> Picked out for particular adverse comment were the increasingly complex tax system, continued infrastructure failings and, generally, the high cost of doing business. The relatively unattractive corporate tax rates have been commented on many times – not least of all by the CPS.<sup>5</sup> It is of note that in 2000 Britain's main rate of Corporation Tax was a highly competitive 30%, when the OECD average was 33.7%. The international average is now 29.1%, less than the UK's. Britain, almost uniquely of the OECD countries, has gone against the international trend of cutting the main business taxes.

The deterioration in the public finances will be discussed in chapter 3.

## **2.4 COMPARISON WITH THE PREVIOUS CONSERVATIVE ADMINISTRATION**

"These are fantastically good figures", the official concluded. "The state of the economy is much better than predicted." Eyes swivelled to Brown. "What am I supposed to do with this?" he snarled. "Write a thank-you letter?"

Tom Bower, *Gordon Brown*, HarperCollins, 2004.

The undermining of potential growth and international competitiveness during the Gordon Brown years compares very unfavourably with the sharpening of economic performance during the five years of the previous Conservative administration.<sup>6</sup> The current Chancellor was indeed fortunate to inherit a "Golden Legacy" from his predecessors, as the Treasury official pointed out to him in the above quotation.

With few exceptions, mainly associated with the record of the Bank of England, the economy's performance since 1997 had been weaker than during the previous five years. This was particularly the case in the public finances since the public spending taps were turned on in 2000, when the Chancellor's "prudent" phase was replaced by his "profligate" phase. The fiscal balances are discussed in chapter 3.

## **LABOUR AND THE GOLDEN LEGACY: A CHECKLIST**

	<b>Performance grade (see below)</b>
<b>Economic activity:</b>	
GDP growth rate	-
Manufacturing output growth rate	--
Business investment growth rate	-
Households saving ratio	--
<b>Balance of Payments:</b>	
Visible trade balance	--
Current balance	--
<b>Labour market:</b>	
Reduction in unemployment	-
Reduction in youth unemployment	--
Change in workforce jobs	+
Change in workforce jobs excl. education, health & public admin.	-
Change in workforce jobs in manufacturing	--
LFS employment rate	=
Productivity growth, whole economy	-
Industrial disputes, working days lost	-
<b>Earnings and prices inflation:</b>	
Rate of reduction in earnings inflation	-
Maintenance of low earnings inflation	+
Rate of reduction in prices inflation	-
Maintenance of low prices inflation	++
<b>Interest rates:</b>	
Rate of reduction in short-term interest rates	-
Maintenance of low short-term interest rates	++
Reduction in & maintenance of long-term interest rates	++
<b>International competitiveness:</b>	
Performance on the WEF index	-
Performance on the IMD index	--
<b>Public finances:</b>	
Performance from FY1997 to FY2000	++
Performance since FY2000	--
<b>Grading system</b>	
++	Consolidating gains and significant improvement in performance
+	Consolidating gains and modest improvement in performance
=	Consolidating gains, performance maintained
-	Modest slippage in performance
--	Significant slippage in performance

Source: R Lea, *Whatever happened to the Golden Legacy?: the economic background to the 2005 Budget*, CPS, 2005.

There is no reason to alter the overall judgements outlined in the previous table. But one thing is relatively certain, with the prospect of very tight spending figures for the financial years 2008/09 to 2010/11, Gordon Brown's successor is unlikely to be sending his predecessor a thank you letter either – though for different reasons. The spending plans will be further discussed in chapter 3.

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## CHAPTER THREE

# **FISCAL TRENDS: STILL POOR**

### **3.1 INTRODUCTION**

The forecasts for the public finances will undoubtedly be of interest to the economic and political commentators in the forthcoming Budget. In particular there will be a focus on:

- Any revisions to the Chancellor's forecasts for the current budget and Public Sector Net Borrowing. In the light of the latest data, only modest changes are expected.
- Discussion on the two fiscal rules. The Chancellor will claim that they are both met.
- Discussion of the 2007 Comprehensive Spending Review, which will celebrate 10 years of power for New Labour and start the planning for another 10 years.
- Any further increases in taxes as the Chancellor continues to shore up his revenues in the light of persistently high borrowing. Despite speculation that the Chancellor will wish to produce "lollypops", his scope is very limited, given the fiscal balances. "Green" taxes could feature significantly for political reasons – they are discussed in chapter 4.

### **3.2 PUBLIC FINANCES: PROSPECTS FOR FY2006 AND BEYOND**

Data for the first 10 months of FY 2006 suggest that the Chancellor will almost meet his PBR forecasts for both the Public Sector Current Budget

balance and Public Sector Net Borrowing (PSNB) of £35.8bn, marginally down on FY2005's figure. Nevertheless, there is still likely to be an overshoot on the Current Budget deficit, albeit modest, and it should be noted that the PSNB figure is still nearly £40bn. The fact that the public sector is still borrowing at such rates, when the economy is supposedly growing well, should not be regarded with complacency. Indeed, given that the economy has been growing since 1993 this relatively unhealthy state of the public finances should be regarded as irresponsible mismanagement. The public finances should be showing healthy surpluses.

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Looking beyond FY2006, the Treasury's forecasts continue to look over-optimistic. The table below compares NIESR's latest forecasts with the Treasury's 2006 Budget and PBR forecasts.

#### **PUBLIC SECTOR FINANCES (£BN)**

	FY05	FY06	FY07	FY08	FY09	FY10	FY11
<b>Public Sector Current Budget</b>							
Budget 2006	-11.4	-7	1	7	10	12	
PBR 2006	-15.1	-8	-1	4	7	10	14
Current outturns	-15.2						
IFS forecast	Na	-9.2					
NIESR forecast	-15.1	-12.4	-7.4	-3.5	-0.3	3.5	7.1
CPS expected outturn	Na	-10					
<b>Public Sector Net Borrowing</b>							
Budget 2006	37.1	36	30	25	24	23	
PBR 2006	37.5	37	31	27	26	24	22
Current outturns	38.9						
IFS forecast	Na	38.1					
NIESR forecast	36.9	38.3	37.2	35.5	33.9	31.6	30.7
CPS expected outturn	Na	38					
<b>Public Sector net debt (as % of GDP)</b>							
Budget 2006	36.4	37.5	38.1	38.3	38.4	38.4	
PBR 2006	36.4	37.5	38.2	38.6	38.7	38.7	
Current outturns	36.5						
NIESR forecast	36.8	38.0	38.7	39.2	39.4	39.3	39.1

The latest data on outturns are from the ONS's January press release on the public finances (20 February 2007).

Sources: HM Treasury, *Budget Report 2006* and *Pre-Budget Report 2006*; NIESR, *National Institute Economic Review*, no. 199, NIESR, January 2007; IFS and Morgan Stanley, *The IFS Green Budget*, IFS, January 2007.

### 3.3 THE FISCAL RULES

The fiscal rules, which were put together in 1997, are:

- *The golden rule*: which states that, on average over the cycle, the government will borrow only to invest and not to fund current spending
- *The sustainable investment rule*: which states that public sector debt as a proportion of GDP will be held over the cycle at a stable and prudent level. The government believes that, other things being equal, it is desirable that public spending net debt should be below 40% of GDP over the cycle.

We have discussed the fiscal rules, and the Chancellor's tinkering with them, at some length in previous papers.<sup>1</sup> The economic cycle for the golden rule, for example, has had four specifications:

- From FY1999 to FY2005: the original specification.
- From FY1997 to FY2005: as altered in July 2005.
- From FY1997 to FY2008: as altered in the 2005 PBR.
- From FY1997 to FY2006: as altered in the 2006 PBR.

Indeed it can be argued that there is now little interest in them. However, on current data it is likely that the golden rule will be met and, for the time being, the sustainable investment rule is also being met – though the NIESR forecast (shown in the previous table) shows that the debt to GDP ratio rises above 39%, not far short of 40%, in the forecast period.

### 3.4 THE 2007 COMPREHENSIVE SPENDING REVIEW

There is much speculation that the Chancellor will be acting “tough” on spending for the next three-year round for FY2008 to FY2010, details of which will be announced in summer 2007. Treasury documents have already released some tight projections (up to FY2011).

#### **TOTAL MANAGED EXPENDITURE (£BN, CURRENT PRICES)**

	FY05	FY06	FY07	FY08	FY09	FY10	FY11
Current expenditure	483.9	508.1	537	562	588	615	643
Gross investment	38.9	46.5	48	51	54	57	60
TME	522.8	554.6	585	613	642	672	703

HM Treasury, *Pre-Budget Report: investing in Britain's potential: building our long-term future*, Cm 6984, December 2006, tables B8 and B16.

In current prices, the Treasury projections for total public spending show a rise of an annual average of just over 4½% for FY2008 to FY2010, compared with average annual increases of nearly 7% for the period FY2000 to FY2007. In real terms, this is equivalent to less than 2% (deflating using the Treasury's assumption of yearly inflation in the GDP deflator of 2¾%) for FY2008 to FY2010. This is eye-wateringly tight especially for departments that are not chosen for special favours (as is education, for example). The annual average increases in spending could be no more than 1.75% (real terms).<sup>2</sup>

### 3.5 HIGHER TAXES: GORDON BROWN'S LEGACY

In chapter 2, there was a brief discussion of the Chancellor's ten year economic legacy, touching on the public finances. In this chapter it is worth noting that when the Conservatives left office in 1997 the public sector finances were moving towards surplus.<sup>3</sup> The Chancellor added to this potential treasure chest by raising taxes – most notoriously by removing the tax credits for dividends paid to pension schemes, which has so damaged occupational pensions. This was Gordon Brown's "prudent" phase, when he was storing up treasure for a "purpose".

The purpose was, of course, the huge injection of funds into the unreformed public services, even allowing for inflation. In financial year 1997/98 total spending was around £320bn, by 2006/07 it was £550bn – some £230bn higher. And its share had risen from 39% of GDP to 43%. The public sector has been awash with funds and wasted many of them.<sup>4</sup>

Of course, taxes have been increased substantially to pay for this. Central Government cash receipts have increased by nearly 50% between FY1997 and FY2005 from £290bn to £415bn - whilst Local Authority taxes (principally Council Taxes) have effectively doubled. Moreover, the Treasury is expecting increases in current receipts of 6½% to 7% for both FY2006 and FY2007.

By FY2008 the Treasury calculates that that Tax/GDP ratio will be 38%. Tax/GDP ratios are heading back to the levels last seen in the mid 1980s.

The following table shows how the UK's tax/GDP trend is against the tide of lower tax burdens in other major economies. These countries appreciate the importance of adopting policies to improve their competitiveness. They seem to realise that heavily taxed economies under-perform and destroy individual incentives. By 2008 the tax burden in the UK is expected to almost match Germany's. Britain has had the highest tax rise among the major EU nations – indeed all major nations – since 1997.

#### GENERAL GOVERNMENT TOTAL TAX AND NON-TAX RECEIPTS (% OF NOMINAL GDP)

	1997	2006e	2008p	2008 minus 1997
Australia	35.6	36.5	35.5	-0.1
Canada	44.5	40.5	40.3	-4.2
France	50.7	51.1	50.9	+0.2
Germany	45.7	43.5	43.5	-2.2
Italy	47.6	44.9	45.6	-2.0
Japan	31.9	31.7	32.5	0.6
Spain	38.2	39.4	39.0	0.8
UK	39.5	42.3	42.8	<b>3.3</b>
US	34.6	34.2	33.8	-0.8
Euro area	46.7	45.4	45.3	-1.4
OECD	38.9	38.6	38.4	-0.5

Source: OECD, *Economic Outlook*, No 80, December 2006.



But even with the higher taxes, and despite 13 years of continuous economic growth, the public finances are still firmly in the red. Gordon Brown is a true “tax ‘n’ spend” Chancellor and, sadly, to so little effect.

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## CHAPTER FOUR

# **CLIMATE CHANGE AND “GREEN TAXES”: BACKGROUND**

### **4.1 INTRODUCTION**

Rarely has an issue so rapidly risen up the political ranks as the need to “manage” climate change by controlling Greenhouse Gas (GHG) emissions, in particular CO<sub>2</sub> emissions from fossil fuels.

There are many sub-issues involved. This chapter looks at some of them, concluding that the science is very uncertain and that the Kyoto process is likely to remain ineffectual. But there are, nevertheless, two sound reasons for trying to reduce the use of fossil fuels. The first is that, whilst the science is uncertain, so are the risks; and an “insurance” policy of curbing the growth of carbon emissions, providing it is cost-effective, is sensible. The second is for energy security reasons. As the UK’s reserves of natural gas and North Sea oil become depleted it is sensible to consider other forms of power for electricity generation and transport.

We cover the sub-issues in section 4.2, by considering the following questions:

- What is the direction of the temperature change?
- Assuming rising temperatures, how big will the temperature increase be?
- What is the Cost-Benefit Analysis of Climate Change?
- How to deal with the costs: adaptation and/or mitigation?

- Are man-made carbon emissions a (or *the*) major cause of climate change?
- Will drastic cuts in man-made carbon emissions “control” the climate?
- Is there the global political will to curb carbon emissions?

Section 4.3 looks at the economic tools, taxes and trading schemes, for encouraging the use of non carbon-emitting fuels.

#### **4.2.1 WHAT IS THE DIRECTION OF THE TEMPERATURE CHANGE?**

We start from the assumption that there is climate change. Indeed climate change is always with us. So the first question is obvious – what is the direction of climate change? The answer seems uncontentious, given the pressures for “controlling global warming”. Global temperatures rose over the last century and most scientists, apparently, take the view that warming will continue through this century. But there is no consensus even on this issue. Some scientists claim that we are due for another Ice Age.

To underline the idea that climate change is an ongoing feature, it is worth noting how temperatures have fluctuated since the ending of the last major glacial period about 12,000 to 10,000 years ago.<sup>1</sup>

- The last glacial period was followed by a warm period which ran from about 9,000 to 4,000 years ago, sometimes known as the “Holocene Maximum”, when average temperatures were, apparently, higher than they are today. Temperatures then cooled, resulting in the “little Archaic ice age” of around 520-350BC. Temperatures warmed in Roman times to be followed by the colder Dark Ages. The Medieval period benefited from higher temperatures. But the subsequent “Little Ice Age” (dating from around 1500 to 1860) included some bitterly cold winters in the 17<sup>th</sup> century when the Thames froze.
- Since the middle of the 19<sup>th</sup> century average temperatures have picked up. But even over this geologically short period of time there have been discernible swings in temperature. The years 1942-70 experienced, for example, cooling and included the bitter winter of 1962/63 which was the coldest in England and Wales since 1740. There were forecasts in the early 1970s that a new Ice Age was imminent. Between the mid 1970s and the late 1990s there was some warming – but since the late 1990s there has been no significant change in global temperatures.

Global average surface temperatures picked up by around a modest 0.6 degrees Celsius (centigrade) during the 20<sup>th</sup> century. Geologist Dr Bob Carter (of The James Cook University, Australia) assesses this change to be within the limits of natural statistical variability.

#### **4.2.2 ASSUMING RISING TEMPERATURES, HOW BIG WILL THE TEMPERATURE INCREASE BE?**

Making the, questionable, assumption that temperatures will continue to rise, the next question is how big will the temperature increase be?

One of the most often quoted sources on this issue is the work of the Intergovernmental Panel on Climate Change (IPCC). The IPCC was set up in 1988 by two UN organisations, the World Meteorological Organisation (WMO) and the UN Environment Programme (UNEP).<sup>2</sup> Its remit is to assess the “risk of human-induced climate change” by analysing the relevant economic and scientific information. The IPCC is composed of representatives largely appointed by governments and is led by government scientists. Their independence from the political process has been challenged on many occasions.

The IPCC is a hugely influential organisation. It solely provides the crucial assessments of man-made climate change that inform the decisions of international policy makers (under UN auspices – see sub-section 4.2.7, below), on climate change.<sup>3</sup> The IPCC has released three full Assessment Reports to date and part of the Summary for Policy Makers (SPM) of the 4<sup>th</sup> Assessment (released in February 2007). The full 4<sup>th</sup> Assessment will be available in May 2007.

The IPCC’s methodology is:<sup>4</sup>

- To develop a series of GHG emissions “scenarios”, given a limited range of mainly economic assumptions including population change, economic growth, technological change and energy usage.
- These emissions scenarios are then fed into a climate change model in order to project temperature changes over the next century.

The Third Assessment Report (TAR, 2001) concluded that temperature increases could range from under 2° to around 6° Celsius by 2100. The Fourth Assessment Report (AR4) has, apparently, narrowed the range of estimates to 2° C to 4.5° C, with a best estimate of about 3° C.

Suffice to say, such statistical techniques are prone to huge ranges of variation and statistical error. Demographic and economic forecasting is notoriously prone to being inaccurate – over 10 years, never mind a century. And the climate system is technically so complex and “chaotic” that the forecasts from even the most sophisticated climate models must be treated with caution. These are two very powerful reasons for treating the IPCC’s projections with extreme caution.

But, leaving aside the basic shortcomings in the IPCC’s methodology, a range of this significance has huge implications for policy. The impact on the environment and humanity of a rise in temperature of around 2° C would be profoundly different from that of a temperature increase of 4½° C. They would require different policy responses.

### **4.2.3 WHAT IS THE COST-BENEFIT ANALYSIS OF CLIMATE CHANGE?**

How do you calculate the economic costs and benefits of climate change, given the huge uncertainties in temperature change forecasts? The simplistic answer is with great difficulty. Indeed any such exercise is littered with uncertainties. But such exercises are essential for policy-making – not least of all because they consider the benefits as well as the costs of climate change. Green pressure groups almost entirely focus on the costs. This is for purely political reasons and totally inadequate.<sup>5</sup>

The Stern Review's cost-benefit analysis, starting with IPCC projections, concluded that “business as usual” would bring devastating consequences and that the benefits of “controlling climate change” comfortably outweigh the costs.<sup>6</sup>

Stern concluded that, without action, up to 200 million people could become refugees because their homes would be hit by drought or flood and up to 40% of species could face extinction. GDP would be damaged and, in the Stern report's worst case scenario, global GDP by the end of the century would be 20% lower than would be the case if climate change had been tackled. He also calculated that the required action to control climate change and avoid the consequent appalling economic consequences would only be equivalent to 1% of global GDP by 2050 – despite requiring draconian cuts of the order of 60% in carbon emissions in power generation.

The Stern Review has, however, come in for some very heavy criticism of its methodology. “The Stern Review: A Dual Critique” for example, criticised both the science and the economics.<sup>7, 8, 9</sup> In the judgement of the, extremely distinguished, authors of the “Dual Critique”, the Stern Review:

- Mishandles data.
- Gives too little attention to actual observation.
- Takes no account of, for example, the chronic limitations of peer reviewing of work relating the climate change that governments have drawn on.

Specifically on the economic aspects, the Stern Review:

- Overstates projected costs of climate change, partly as a result of its failure to acknowledge the scope for long-term adaptation to global warming.
- Underestimates the likely cost – including the world's poor - of the drastic global mitigation programme that it calls for.
- Proposes worldwide adoption of an especially low rate of interest for discounting the costs and benefits of mitigation. This implies that today's generations should pay for the benefits of future generations, who are likely to be much richer.

In conclusion, the Stern Review is deeply flawed and does not provide a basis for informed and responsible policies.

#### **4.2.4 HOW TO DEAL WITH THE COSTS: ADAPTATION AND/OR MITIGATION?**

There *are* costs, as well as benefits, from climate change. The next question is, therefore, what policies are right for dealing with the potential costs of climate change? In the past, ever-resourceful humans used the technologies of the age to adapt though, inevitably, there were casualties. And there is no reason to believe that humans will not be able adapt in the technologically-sophisticated 21<sup>st</sup> century. Indeed, at face value, it is implausible to suggest that mankind could *not* adapt – especially as the technology is now very sophisticated and likely to become even more sophisticated as the century progresses.

For those regions of the world especially vulnerable to climate-related damage, especially some poor developing countries, appropriate trade-and-aid policies should be developed. It is a moral duty on the well-off countries to assist the less advantaged countries under these circumstances.

*It is implausible to suggest that mankind could not adapt to climate change – especially as the technology is now very sophisticated and likely to become even more sophisticated as the century progresses.*

But adaptation, for all its benefits, is not the chosen priority option of the UN's environmental policy makers. (See sub-section 4.2.7, below, for discussion of the UNFCCC and the Kyoto protocol.) Instead they have chosen the “mitigation” route with the objective of “managing climate change” by curbing anthropogenic carbon emissions.

The UN's mitigation approach begs huge questions:

- Are anthropogenic CO<sub>2</sub> emissions a major cause (or *the* major cause) of climate change, as the UN believes, especially as anthropogenic CO<sub>2</sub> emissions are a tiny proportion of total atmospheric CO<sub>2</sub>? This is at the heart of the uncertain science of climate change; and, contrary to the claims made by Stern and others, there is no scientific “consensus” about this at all. The scientific debate is far from an open and shut case.
- Even if man-made carbon emissions were a major cause of global warming, and if carbon emissions were to be drastically cut, would mankind be able to “control” climate change?
- Assuming that man-made carbon emissions are primarily causing global warming then, globally, would there be the political will and are there the mechanisms to make the drastic called-for cuts in man-made carbon emissions? This issue involves discussion of the Kyoto Protocol of 1997.

These questions will be considered in the next three sub-sections.

#### **4.2.5 ARE MAN-MADE CARBON EMISSIONS A (OR THE) MAJOR CAUSE OF CLIMATE CHANGE?**

This is the crux of the scientific debate and, contrary to the assertions by many commentators including Stern, there is no scientific consensus about this at all. Stern, for example, would have people believe that man-made carbon emissions are a major cause, if not *the* major cause, of global warming and that the science is “settled”. But the science is not “settled”.

At its simplest, the man-made carbon emissions theory of global warming claims that:

- Mankind’s burning of fossil fuels results in the release of emissions into the atmosphere.
- These carbon emissions act as GreenHouse Gases (GHGs). Other GHGs include water vapour and methane.
- GHGs blanket the earth, trap the sun’s heat and, thus, warm the earth.
- Moreover, they warm the earth “dangerously”.
- It should, however, be noted that:
- Burning fossil fuels also results in sulphate aerosols, which are tiny particles in the atmosphere. These aerosols reflect the sun’s heat back into space and cool the earth. The combustion of fossil fuels can, therefore, cool as well as warm the earth.
- Man-made CO<sub>2</sub> emissions make up a tiny proportion of atmospheric CO<sub>2</sub>.

There are two major, and inter-related, types of challenge to this explanation. The first is that, even though many scientists agree that man-made CO<sub>2</sub> emissions can have an effect on global temperature – they fundamentally disagree about the *degree* of the effect.<sup>10</sup>

The second is that there are almost certainly other, overwhelmingly natural, reasons for temperature change. These include the variability of the sun’s activity and the effect of cosmic rays. Recent research by the Danish National Space Center (DNSC), for example, showed how cosmic rays from exploding stars can encourage cloud formation in the earth’s atmosphere. There is, therefore, a positive correlation and causality between cosmic rays and cloudiness. This is relevant to global warming.<sup>11</sup>

According to these scientists the link between cosmic rays and global warming is as follows:

- The Sun’s magnetic field shields the earth from cosmic rays. The magnetic field strengthened significantly during the 20<sup>th</sup> century.
- This strengthening resulted in the reduction of the influx of cosmic rays.
- A reduced influx of cosmic rays resulted in, if the DNSC is right, less cloudiness.

- Cloudiness, especially low-altitude clouds, has an overall cooling effect. Less cloudiness means less global cooling and, hence, more global warming.
- In conclusion, the Sun's strengthened magnetic field, by deflecting cosmic rays and preventing cooling cloudiness, contributed to last century's global warming.

Science is about uncertainty. And there are many uncertainties about the science of climate change.<sup>12</sup> There are also many complexities. This is not the place to go into these but one point is of utmost significance. There is fairly convincing evidence to show a positive correlation between carbon concentration in the atmosphere and temperature, but many scientists question the frequently assumed direction of causality. The assumption in "green politics" is that higher carbon concentrations cause higher temperatures. Many scientists suggest that the evidence points to a reverse causality, where higher temperatures lead to higher carbon emissions.

Fundamentally, the "scientific consensus" on climate change is a political construct and fundamentally alien to the way scientists should operate.<sup>13</sup> But, apparently, if scientists challenge the "consensus" on climate change they are far less likely to receive official funding in the UK. This can sway scientists.

#### **4.2.6 WILL DRASTIC CUTS IN MAN-MADE CARBON EMISSIONS "CONTROL" THE CLIMATE?**

If we assume, for argument's sake, there is some truth in the man-made theory of global warming, the next question is: can humans "control" or "predictably manipulate" the climate by curbing carbon emissions? The answer can only be in the affirmative if the univariate model of climate change where higher carbon emissions cause higher temperatures is fundamentally right. Indeed, temperatures could even rise if the burning of fossil fuels was reduced (in order to cut carbon emissions) because of the reduction in the cooling aerosols.

#### **4.2.7 IS THERE THE GLOBAL POLITICAL WILL TO CURB CARBON EMISSIONS?**

If, for the sake of argument, it is accepted that the essentially univariate model of climate change is valid, the next question is whether there is the global political will to drastically curb carbon emissions as recommended by, for example, the Stern Review. After all, a global matter such as global warming requires a global response.

The global framework for dealing with climate change is the UN. The UN Framework Convention on Climate Change (UNFCCC) was initially developed at the Earth Summit held in Rio de Janeiro in 1992 and was the first international environmental treaty aimed at reducing greenhouse gas emissions in order to combat global warming. This was essentially the first international agreement on the mitigation approach to climate change. The UNFCCC did not, however, set mandatory emission limits or contain enforcement provisions. The highly significant and path-breaking Kyoto protocol to the UNFCCC of 1997 sought to correct these shortcomings.



Under this protocol, signatory countries agreed to legally binding reductions in emissions averaging 6% to 8% below 1990 levels for the years 2008-2012.

The agreement and/or compliance to the Kyoto process is, however, patchy:

- The EU15 agreed to cut its GHGs by 8% between 1990 and 2008-2012. The UK, under “burden-sharing”, agreed that it would cut its greenhouse gas emissions by an above-average 12.5%. Of the EU15 countries, ostensible enthusiasts all, only the UK, Sweden, Germany and nuclear-powered France appear likely to hit their Kyoto compliant targets. The EU15 as a whole will miss its targets.
- At the EU March Summit, the EU27 agreed a headline target of cutting its greenhouse gases by 20% by 2020 compared with 1990.<sup>14</sup> Whether or not there will be better compliance with these targets is questionable.
- It should be added that the UK, unilaterally, has tighter stated targets of cutting CO<sub>2</sub> emissions by 20% by 2010, which will be missed, and 60% by 2050 compared with 1990.<sup>15</sup>
- The major carbon emitting countries of the US and Australia did not ratify the protocol.
- India and China were effectively exempt.

The post-2012 Kyoto-style carbon reducing programme is currently being devised. It is expected to have tougher targets and compliance mechanisms. There are also some expectations that the country coverage will be more extensive than with the first programme. But this is questionable – especially concerning China and India.

***By 2030 China will be the largest emitter. The projected increases in China’s CO<sub>2</sub> emissions over the next 25 years simply dwarf any other developments.***

China, for example, recently embarked on a programme for building over 560 large coal-fired power stations by 2012 – more than one a week. China will not be cutting its carbon emissions in the near-term. The UK produces a mere 2% of total global man-made carbon emissions and, even if the UK closed all its power stations, that would only be equivalent to a year’s increase in China’s emissions. See annex table 5, for CO<sub>2</sub> emissions by country, for more data.

According to the Energy Information Administration, even though the US is currently (2002) the largest producer of CO<sub>2</sub> emissions accounting for 24% of total emissions, by 2030 China will be the largest emitter. The projected increases in China’s CO<sub>2</sub> emissions over the next 25 years simply dwarf any other developments.<sup>16, 17</sup> See annex table 6, for World CO<sub>2</sub> emissions by region, 1990-2030.

The Kyoto process of trying to curb global carbon emissions has not been a success to date. It has been ineffectual. Moreover, its future success has to be doubted given the very understandable wishes of China and India and other developing countries to grow out of poverty. Such growth inevitably involves the use of fossil fuels. Given the uncertainties over the science of climate change there is, arguably, no case for expecting these countries to behave otherwise and assume the costs of cutting back on fossil fuels for very uncertain benefits.

In conclusion the objective of achieving meaningful global political agreement on cutting back carbon emissions looks like a pipedream. Without India's and, especially, China's agreement the Kyoto process and procedures will remain ineffectual.

#### **4.3.1 TAXES AND TRADING SCHEMES: INTRODUCTION**

Even though the science of climate change is uncertain, and the Kyoto process is likely to remain ineffectual, there are, however, two sound reasons for trying to reduce the use of fossil fuels and the attendant carbon emissions provided the costs are not prohibitive:

- While the science of climate change is uncertain, the risks of unrestricted carbon emissions are uncertain as well; and, therefore, cost-effective restrictive policies are a sensible insurance policy.
- As the UK's reserves of natural gas and North Sea oil become depleted it is sensible to consider other forms of power for electricity generation and transport.

There is therefore a reasonable coincidence of interests between cutting carbon emissions for climate change reasons; and for improving security of energy supply.<sup>18</sup> In order to encourage the switch from high carbon emitting fossil fuels towards cleaner technologies, there are two main economic tools:

- Financial support for and investment in low carbon emitting technologies and energy sources. It is acceptable on these grounds to subsidise, for example, the use of renewables, nuclear power and/or clean coal technology (CTC) (along with carbon capture and storage (CCS)). This approach has great potential in developing countries. The Asia-Pacific Partnership (APP), for example, with its emphasis on clean technology appeals to China and India whilst the Kyoto-style mandatory carbon targets basically do not.
- Increase the "price" of carbon by imposing new carbon taxes and/or introducing carbon trading. Carbon taxes specify a price and the market adjusts the quantity. Emissions trading schemes specify a quantity (permits) and the market adjusts the price. They both work with and yet interfere with market mechanisms.

There are advantages and disadvantages to taxes, on the one hand, and trading schemes, on the other. But taxes do have the following advantages:<sup>19</sup>

- Business knows the cost of carbon with a tax – the cost is predictable and relatively certain – whereas prices can be very volatile under permit trading (and have been under the EU’s Emissions Trading Scheme).
- There is no need to set arbitrary baselines and targets with taxes – as with trading schemes. The absence of targets is sometimes considered a disadvantage of taxes because, of course, no targets are met. But this assumes there is a “correct” level of emissions, irrespective of costs. And costs should be taken into account, which they are not in the Kyoto-style approach of “reductions at any cost”.
- The imposition of carbon taxes can be used to lower taxes elsewhere in the economy in order to maintain the overall competitiveness of business and/or people’s real disposable income. Carbon taxes inevitably raise fuel and energy costs to both business (making high energy using industries less competitive) and consumers (in a regressive way). A well thought-through tax system should be able to make offsetting adjustments.
- Current fuel taxes can be coordinated with other carbon taxes to provide a balanced package of taxes on carbon.
- Trading schemes are prone to distortions (see comments on the EU Emissions Trading Scheme) and, arguably, the allocation of permits to “polluters” can lead to corruption.
- Administratively, tax collection is more straightforward than the maintenance of permit trading schemes. The EU’s trading scheme, for example, is complicated and has imposed high administrative burdens compared with an energy tax or a focussed emissions tax on power stations.

#### **4.3.2 THE EU’S EMISSION TRADING SCHEME**

As part of the Kyoto process, EU environment ministers set up the Emissions Trading Scheme (ETS) which is a market to trade pollution permits for CO<sub>2</sub>, the main “greenhouse” gas. The scheme caps the amount of CO<sub>2</sub> that certain industries can produce (“cap”) and allows companies to trade (“trade”) emissions rights within the EU.

For example, firms that exceed their emissions limits can buy extra “allowances” from firms whose emissions are under target levels. In this context, “allowance” means the entitlement to emit a tonne of carbon dioxide or an amount of any other greenhouse gas with an equivalent global warming potential during a specified period.

The ETS began operating in January 2005. The first trading period (“phase”) runs from 2005 to 2007, followed by a second phase that will run from 2008 to 2012. Further five-year trading periods are expected subsequently. The ETS works on a “Cap and Trade” basis and is currently restricted to carbon dioxide emissions.

Under the ETS, Member States have to compile a National Allocation Plan (NAP) for each trading period. They have to decide a “cap” for total emissions allowances and then allocate the capped total (as permits) to selected individual plants and other “installations” according to predetermined criteria. The recipients of the permits can use their allowances for their own carbon dioxide emissions, sell their surplus allowances to others if they have any or, if they run short, buy the necessary allowances from others through the EU-wide market.

Emissions Trading Schemes can work successfully but the EU’s ETS has attracted much criticism. The main problem concerns the allocation of emissions permits by Member States for 2005 to 2007. National Governments were, apparently, left to choose their own targets, with few restrictions from the Commission. The UK set stringent targets, whilst most of the other Member States, including Germany, did not. Open Europe<sup>20</sup> calculated that UK firms paid nearly £500m for extra permits from business rivals in other Member States in 2005, whilst German firms received nearly £300m. In addition, some British firms, especially electricity generating companies, reduced their emissions and hence output because they were short of permits. Inevitably this led to higher electricity prices in the UK.<sup>21</sup>

There are other problems as well. According to Open Europe member states handed out free permits for nearly 1,830m tonnes for 2005, whilst emissions were only 1,785m tonnes. The scheme, therefore, was not reducing emissions at all. When it was realised in April 2006 that many member states, especially Germany, had set over-loose targets the secondary market for emissions permits crashed.

Planning for the second trading period (2008 to 2012) is well under way. The EU claims that it will be tougher and fairer than the first. But the omens do not look encouraging. The UK Government has already submitted its plans with a tough 3% reduction target for carbon emissions. Germany’s proposed plans are altogether less stringent.

It is clear that all Governments should act consistently, objectively and fairly, if some member states are not to be disadvantaged. Permits for carbon emissions should be auctioned in an open and transparent market or, if allocated by Governments, allocated fairly between emitters. This has not been the case to date and is most unlikely to be the case in future.

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## CHAPTER FIVE

# A GREEN CHANCELLOR?

### 5.1 INTRODUCTION

There is little doubt that “green” politics, encompassing climate change issues, are topical. There is every expectation that they will remain topical – until the electorate realise that such measures are:

- Ineffective in preventing climate change.
- Costly and, moreover, regressively costly.

The Government has already introduced a variety of “green” measures. It is expected that there will be more in the Budget. But, given, the unpopularity of extra taxes, the Chancellor may play a cautious hand in imposing extra “green” taxes. The electorate is already cynical about the way in which green issues have been treated as justification for extra revenue raising.

### 5.2 THE RECORD SO FAR

The main Government’s measures to improve environmental incentives have been:<sup>1</sup>

- Setting up the Stern review of the economics of climate change (discussed in chapter 4). But this was widely seen as a prop for raising taxes.<sup>1</sup> Indeed, when the Chancellor doubled Air Passenger Duty (APD) in the 2006 PBR without any offsetting cuts, people’s suspicions were confirmed that green taxes were more a matter of increasing revenue than saving the planet.

- Introducing the landfill tax escalator.
- Changing the company car-tax regime to reflect vehicle emissions rather than mileage.
- Linking Vehicle Excise Duty to the emissions ratings of vehicles.
- Introducing the climate change levy, seen by the Government as the biggest single contributor to the UK's emissions reduction effort. But the climate change levy is not strictly a carbon tax (it is a tax on energy). This should be replaced by a proper carbon tax.
- Introducing the world's first carbon emissions trading system. The Government is now a strong proponent of a more effective EU Emissions Trading System (discussed in chapter 4).

Despite these reforms, receipts from environmental taxes have fallen as a share of national income since 1999. The measures announced, including the unpopular doubling of Air Passenger Duty (APD), in the 2006 PBR, the will do little to reverse this. However the UK still takes a higher share of national income from green taxes than the OECD average.<sup>2</sup>

The decline in green tax revenue as a share of national income is largely due to the Government's decision to abandon annual above-inflation increases in fuel duty, in the wake of the 2000 fuel protests. But the fiscal reality is that raising green tax revenues substantially through the existing tax system will be difficult without significantly higher rates of fuel duty. This would be highly unpopular. Longer-term reforms may dramatically alter the structure of green taxes. But increasing green taxes may conflict with Government targets for fuel poverty (or poverty in general) or with the desire to promote business competitiveness.

Environmental taxes are a considerable source of revenue for the Chancellor. But as the table below shows, the revenues from fuel duty dwarf any other revenues.

#### **CURRENT ENVIRONMENTAL TAXES: RECEIPTS**

	<b>Tax</b>	<b>Latest receipts</b>	<b>Date</b>
<b>Transport taxes</b>	Fuel duty	£23.5bn	2005
	Vehicle Excise Duty (VED)	£4.8bn	2005
	VAT on fuel duty	£4.1bn	2005
	Company car taxation	£2.1bn	FY2004
	– Company cars/vans (tax & NI):	£0.5bn	FY2004
	– Company fuel (tax & NI):		
	APD (doubled in Feb 2007)	£0.9bn	2005
<b>Energy taxes</b>	VAT on domestic fuel	£0.9bn	FY2006 estimate
	Climate change levy	£0.75bn	2005
	Renewables obligation (cost on electricity suppliers if they fail to meet targets for using renewables sources)	N/a	
<b>Resource taxes</b>	Landfill tax	£0.7bn	2005
	Aggregates levy	£0.3bn	2005
	Water abstraction charges	£0.1bn	FY2006

Source: IFS and Morgan Stanley, *The IFS Green Budget*, IFS, January 2007.

In addition the Climate Change Bill has been introduced. The Government's plans include:

- Targets to reduce carbon emissions by 60% by 2050 and 26-32% by 2020. There are no plans for annual targets for emissions reductions.
- Greater energy efficiency, with more consumers becoming “producers” of their own energy at home.
- Investment in low-carbon fuels and technologies, such as carbon capture and storage.
- Carbon “budgets” – which cap emissions levels – set every 5 years.
- The Government reporting annually to Parliament on its progress in controlling emissions.

*Taxpayers are cynical about the claims that green taxes are truly environmental and, within the existing framework of tax options, the scope to raise significant sums of money is fairly limited.*

### **5.3 THE BUDGET**

With green issues high on the political agenda, there will doubtless be considerable pressure on the Chancellor to raise further the receipts from green taxes. There are, however, draw backs as already suggested. Taxpayers are cynical about the claims that they are truly environmental and, within the existing framework of tax options, the scope to raise significant sums of money is fairly limited unless above-inflation rises in fuel duty rates are once again enacted. Given the 2000 fuel protests this is very unlikely.

However, the Chancellor is likely to bring in extra green policies. Speculations include:

- reduced VAT rates for energy efficient household appliances and cars;
- higher VAT rates for the worst energy consuming goods and cars;
- higher duties on petrol/diesel and incentives for green energy generation.

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# ANNEX TABLES

**TABLE 1: TREASURY GDP GROWTH FORECASTS FOR 2000 TO 2008: MID-POINTS FROM 2000**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Nov 97	(2½)									
Mar 98	(2½)									
Nov 98	(2½)	(3)								
Mar 99	(2½)	(3)								
Nov 99	(2¾)	(2½)	(2½)							
Mar 00	(3)	(2½)	(2½)							
Nov 00	3	(2½)	(2½)	(2½)						
Mar 01	3	(2½)	(2½)	(2½)						
Nov 01	3	2¼	(2¼)	(3)	(2½)					
Apr 02		2¼	(2¼)	(3¼)	(2¾)					
Nov 02		2	1½	(2¾)	(3¼)	(3)				
Apr 03			1¾	(2¼)	(3¼)	(3¼)				
Dec 03			1¾	2	(3¼)	(3¼)	(2¾)			
Mar 04				2¼	(3¼)	(3¼)	(2¾)			
Dec 04				2¼	3¼	(3¼)	(2¾)	(2½)		
Mar 05					3	(3¼)	(2¾)	(2½)		
Dec 05					3¼	1¾	(2¼)	(3)	(3)	
Mar 06						1¾	(2¼)	(3)	(3)	
Dec 06						1¾	2¾	(3)	(2¾)	(2¾)
Current outturn	3.8	2.4	2.1	2.7	3.3	1.9	2.7			

Sources: Successive Budget Statements and Pre-Budget Reports. The forecast data, shown in brackets, relate to the mid-point of the forecasts. ONS press releases and database for current out-turn.

**TABLE 2: TREASURY FORECASTS FOR THE PUBLIC SECTOR CURRENT BUDGET BALANCE (£BN), FROM FINANCIAL YEAR 2000/01.**

Date of forecast	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
Nov 98	3	8	10	11								
Mar 99	4	8	9	11								
Nov 99	11	13	13	12	11							
Mar 00	14	16	13	8	8							
Nov 00	16.6	16	14	8	8	8						
Mar 01	23.1	17	15	8	9	9						
Nov 01	25.1	10.3	3	4	7	8	9					
Apr 02	21.6	10.6	3	7	9	7	9					
Nov 02		7.7	-5.7	-5	3	5	8	10				
Apr 03		9.9	-11.7	-8	-1	2	6	9				
Dec 03			-11.8	-19.3	-8	-5	0	4	8			
Mar 04			-12.3	-21.3	-11	-5	0	4	9			
Dec 04				-21.1	-12.5	-7	1	4	9	12		
Mar 05				-20.4	-16.1	-6	1	4	9	12		
Dec 05					-19.9	-10.6	-4	0	7	11	13	
Mar 06					-19.0	-11.4	-7	1	7	10	12	
Dec 06						-15.1	-8	-1	4	7	10	14
Current outturn	23.9	10.4	-11.7	-18.6	-18.9	-15.2						

Sources: Successive Budget Statements and Pre-Budget Reports. ONS press releases for current out-turn.

**TABLE 3: TREASURY FORECASTS FOR THE PUBLIC SECTOR NET BORROWING (£BN), FROM FINANCIAL YEAR 2000/01.**

Date of forecast	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
Nov 98	5	2	2	1								
Mar 99	3	1	3	4								
Nov 99	-3	-3	1	4	6							
Mar 00	-6	-5	3	11	13							
Nov 00	-10.1	-6	1	10	12	13						
Mar 01	-16.4	-6	1	10	11	12						
Nov 01	-18.8	2.5	12	15	13	13	13					
Apr 02	-15.9	1.3	11	13	13	17	18					
Nov 02		1.2	20.1	24	19	19	19	20				
Apr 03		-0.4	24	27	24	23	22	22				
Dec 03			22.5	37.4	31	30	27	27	24			
Mar 04			22.9	37.5	33	31	27	27	23			
Dec 04				34.8	34.2	33	29	28	24	22		
Mar 05				35.4	34.4	32	29	27	24	22		
Dec 05					38.8	37.0	34	31	26	23	22	
Mar 06					39.7	37.1	36	30	25	24	23	
Dec 06						37.5	37	31	27	26	24	22
Current outturn	-20.1	0.9	24.7	33.8	38.8	38.9						

Sources: Successive Budget Statements and Pre-Budget Reports. ONS press releases for current out-turn.

**TABLE 4: SPENDING REVIEWS: TME PLANS (£BN)**

Year	Item	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07
1998	DEL	168.8	<b>179.2</b>	<b>190.1</b>	<b>200.2</b>						
	AME	164.8	<b>172.4</b>	<b>179.9</b>	<b>189.5</b>						
	TME	333.6	<b>351.6</b>	<b>370.0</b>	<b>389.7</b>						
2000	DEL		176.8	195.2	<b>212.1</b>	<b>229.3</b>	<b>245.7</b>				
	AME		163.9	176.4	<b>180.8</b>	<b>186.2</b>	<b>193.9</b>				
	TME		340.7	371.6	<b>392.9</b>	<b>415.4</b>	<b>439.6</b>				
2002	DEL					239.7	<b>263.5</b>	<b>279.8</b>	<b>301.0</b>		
	AME					178.7	<b>191.2</b>	<b>201.7</b>	<b>210.4</b>		
	TME					418.4	<b>454.6</b>	<b>481.5</b>	<b>511.4</b>		
2004	DEL							279.3	<b>301.9</b>	<b>321.4</b>	<b>340.5</b>
	AME							208.3	<b>218.9</b>	<b>227.8</b>	<b>239.5</b>
	TME							487.6	<b>520.8</b>	<b>549.2</b>	<b>580.0</b>

DEL = Departmental Expenditure Limit (net of depreciation).

AME = Annually Managed Expenditure.

TME = Total Managed Expenditure. TME=DEL+AME.

Sources: Successive Spending Reviews. The bold data show the new spending plans for each Spending Review. The summer 2007 Spending Review will specify the plans for FY2008 to FY2010.

**TABLE 5: CO<sub>2</sub> EMISSIONS, BY COUNTRY (COVERS ALL COUNTRIES EMITTING AT LEAST 1% OF TOTAL EMISSIONS)**

Country	CO <sub>2</sub> emissions, million tonnes	% of total CO <sub>2</sub> emissions
World total	24,126	100.0
US	5,844	24.2
EU	3,683	15.3
Of which:		
– Germany	805	3.3
– UK	543	2.3
– Italy	433	1.8
– France	368	1.6
– Spain	305	1.3
– Poland	296	1.2
China (inc Hong Kong)	3,550	14.5
Russia	1,432	5.9
India	1,221	5.1
Japan	1,204	5.0
Canada	517	2.1
S Korea	446	1.8
Mexico	384	1.6
Iran	360	1.5
Australia	356	1.5
South Africa	345	1.4
Saudi Arabia	341	1.4
Brazil	314	1.3
Ukraine	307	1.3
Indonesia	306	1.3

Source: UN Statistics Division, data collected in 2002, quoted in R Lea, *UK carbon emissions restrictions: keep our response proportionate*, CPS, September 2006.

**TABLE 6: WORLD CO<sub>2</sub> EMISSIONS BY REGION, 1990-2030 (MILLION TONNES)**

	1990e		2002e		2003e		2010p		2030p		average change % p.a., 2003-30
	M tonnes	% of total	M tonnes	% of total	M tonnes	% of total	M tonnes	% of total	M tonnes	% of total	
US*	4,978		5,748	24%	6,797		7,505		9,735	22%	1.3
OECD Europe†	4,089		4,203	17%	4,264		4,474		5,123	12%	0.7
China	2,241		3,273	13%	3,451		5,857		10,716	25%	4.2
Russia	2,334		1,546		1,606		1,799		2,374		1.5
India	578		1,011	4%	1,023		1,369		2,205	5%	2.9
Japan	1,011		1,191		1,206		1,200		1,219		0
Canada	474		570		596		683		873		1.4
S Korea	234		462		470		608		843		2.2
Mexico	300		369		405		457		747		2.3
Australia/New Z.	291		410		415		462		576		1.2
Brazil	220		347		348		423		610		2.1
Total world	21,223		24,314		25,028		30,362		43,676		2.1

Source: *International Energy Outlook, 2006*, Energy Information Administration (EIA), quoted in R Lea, *UK carbon emissions restrictions: keep our response proportionate*, CPS, 2006.

\* Note: US energy-related CO<sub>2</sub> emissions were almost flat in 2005 – from 5,903m tonnes in 2004 to 5,909m tonnes in 2005.

† No breakdown for Europe provided from this source.

E=estimate; P=projection.