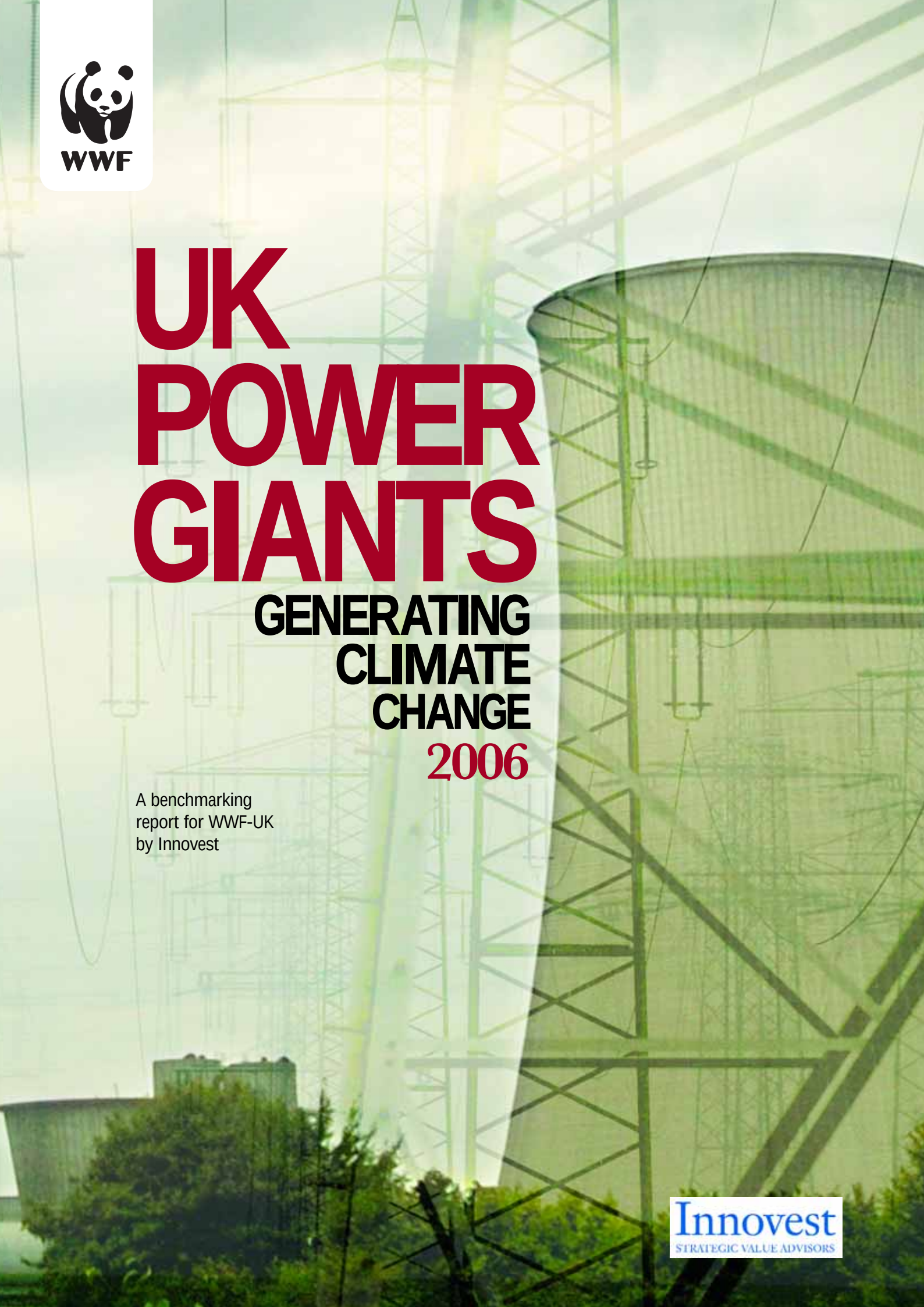

UK POWER GIANTS

GENERATING CLIMATE CHANGE 2006

A benchmarking report for WWF-UK by Innovest

Innovest
STRATEGIC VALUE ADVISORS

Disclaimer

The opinions expressed in this publication are those of the author and do not necessarily reflect the views of WWF-UK. This report is based on company information and emissions data available at the time of research (early 2005), so does not include the 2005 emissions data published in 2006 by the DTI. Further analysis will be necessary to assess whether emissions recorded in 2004/05 would affect the ranking of the companies featuring in this report.

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GLOSSARY

Accreditation (of renewable energy facility or an energy efficiency scheme): registration by the UK power generators with the UK regulatory agencies of new renewable power generation stations and/or consumer energy efficiency schemes.

Carbon emissions (absolute): for any given producer, the total volume of greenhouse gas emissions, which is not adjusted/scaled by the manufacturing output – in this case, total volume of electricity produced.

Carbon emissions (relative): for any given producer, the total volume of greenhouse gas emissions divided by the unit of production – in this case TWh (Terawatt/hours of energy) produced.

Carbon sequestration: the process of capturing and storing carbon in soil, underground, ocean water or vegetation to prevent/slow down its release into the atmosphere.

Clean Development Mechanism (CDM): project-based emissions reduction activities performed by various commercial entities from emissions-capped countries in developing, non-capped states. CDM emissions reduction projects cannot be carried out under the rubric of the Official Development Assistance (ODA) and they have to comply with the specific requirements of host countries.

CERs (Certified Emissions Reduction Units): credits received for investing and implementing a CDM project. The number of CERs received from a project is proportional to the number of tons of CO_2 equivalent prevented from being emitted in the course of project realisation.

Defra: The Department for Environment Food and Rural Affairs.

DTI: The Department of Trade and Industry.

Emissions Reduction Allowance: the unit of emissions trade in a capped system, which entitles a polluter to emit a given quantity of a specific discharge.

Emissions Reduction Credit: an emissions reduction unit denoting discharge reduction in excess of the allowance. Credits are usually generated as a result of implementing an emissions reduction project.

Emissions Trading: a regulation allowing companies to buy/sell emission reductions from/to another facility/company or from/to the marketplace subject to the presence of emissions reduction price differentials between facilities or companies involved. The EU Emissions Trading Scheme (EU ETS) places a carbon dioxide emissions ceiling on all participant sectors. Under the ceiling, each sector receives a quota of emissions allowances. Emissions trading allows commercial entities with higher emissions abatement costs to stay under the permitted emissions ceiling by purchasing allowances and/or credits from the entities with lower marginal emissions abatement costs.

Energy Demand Management (demand management education): measures established and financed by energy suppliers to encourage more efficient energy use by their customers. The same as EEC (see below).

Energy Efficiency Commitment (EEC): the UK regulation requiring electricity/energy suppliers to achieve a certain target in domestic/residential customer energy efficiency. The regulation is aimed at reducing carbon emissions from British households. The first phase of the EEC is operational in 2002-05, where the overall Energy Efficiency (EE) target is set at 62 TWh over three years, which corresponds to the cumulative household emissions reductions of 1%. To ensure that low-income customers can benefit from EE measures promoted by energy suppliers, at least 50% of all energy savings have to be from households in the low-income group (a "Priority Group" receiving income-related tax benefits and credits).

Energy Services: a combined provision of products accompanying the basic heating and powering services of the UK utilities, such as metering energy use, energy efficiency premise auditing, premise insulation, energy service billing and other products bundled into one "service provision basket". Energy service customers can range from individual households to large commercial entities.

EUA: Emissions Reduction Allowance specific to the EU Emissions Trading Scheme (EU ETS). This allowance is unique to the EU ETS, since Assigned Amount Units (AAUs) allocated to countries under the Kyoto Protocol are not directly traded in the European system. The EUAs were separated from Kyoto's allowances as Europeans decided that the EU ETS would be implemented regardless of whether the Kyoto Protocol went into effect.

Grandfathering: assigning individual company greenhouse gas (GHG) emissions allowances on the basis of *historical* level/ intensity of those emissions.

Green tariff: a tariff when an electricity supplier matches all energy used by its customers (or a percentage of such usage) by renewable energy. Under a green tariff, consumers pay a premium for their electricity, which is invested by the energy supplier in new renewable energy developments. Some utilities match consumers' premiums by investing an equal share of corporate funds in new renewables capacity; others use only the premium paid by the customers.

Joint Implementation (JI): a project-based policy allowing companies from the GHG emissions-capped countries in the OECD to invest in emissions reduction in capped states in eastern Europe and the former Soviet Union. By exercising this form of foreign direct investment, emissions-capped companies in the OECD can claim emissions reduction rights on the projects achieved with lower emissions abatement costs.

National Allocation Plan: a regulation assigning carbon allowances to companies falling within the EU-ETS capped sectors.

Ofgem: The Office of Gas and Electricity Markets.

Power generation capacity: the maximum amount of electricity production possible by a given power station or a strictly specified type of power generating technology per specified unit of time.

Project Design Document (PDD): a standardised report containing a feasibility study of a GHG emissions reduction project. PDDs usually include project baseline, detailed presentation of technology/processes used to reduce GHG emissions, revision of public consultation protocols, a description of all project activities related to installation/operation of the proposed technology and so on. Preparation of PDDs is required to gain certification and verification of CDM projects.

Renewables Obligation (RO): a legislative order which came into force in April 2002. This requires licensed electricity suppliers in the United Kingdom to source at least part of their electricity from renewable generation. The RO starts at 3% of total electricity supplied to customers in Great Britain in 2002/03 and reaches 10.4% in 2010/11. Any licensed electricity supplier can meet its Obligation by producing Renewables Obligation Certificates or by making a buy-out payment to the fund which re-invests that payment back into the UK renewables system.

Renewables Obligation Certificate (ROC): A certificate guaranteeing that a generating station has produced a specified amount of electricity from an approved renewable energy source and that it has supplied the specified amount of renewable electricity to UK power consumers. In Scotland ROCs are called SROCs (Scottish Renewables Obligation Certificates).

Scottish Renewables Obligation: This is the same as an RO, but is applied to Scotland due to its abundant supplies of hydropower and the high cost differentials of securing renewable supplies in Scotland relative to the rest of the UK.

1. EXECUTIVE SUMMARY AND INTRODUCTION

WWF-UK and climate change

WWF's climate change campaign challenges the biggest global CO_2 emitter – the power sector – to become CO_2 free in developed countries by 2050. As part of this campaign, WWF-UK is calling on power companies and the UK government to achieve a 60% CO_2 emissions reduction from the UK's power sector by 2020. In particular, the campaign is calling for a transparent and strong phase II EU Emissions Trading Scheme (EU ETS).

This year's report

Much has happened in the UK power sector since our first ranking report was published in 2005 – for example, the launch of the DTI's energy review consultation and electricity and gas price rises – so continuing the work begun by that first study is both timely and warranted. This year's report is much more detailed and comprehensive, due to improved data disclosure by the companies.

Following last year's study of the six major power companies in the UK, this year's report is the first benchmarking analysis of what will be an annual study. It aims to assess the six main UK power companies and their performance, activities and plans relating to emissions of CO_2 and other greenhouse gases, the primary causes of human-induced climate change. As with last year's report, the research compares the "carbon profile" of the power companies by examining their approach to managing and reducing emissions in order to combat climate change. A benchmarking analysis was carried out to assess key questions such as how CO_2 emissions have changed over time, how energy efficiency and renewable energy policies are being implemented, and how actions and investments in terms of voluntary commitments and responses to current government regulations are developing.

This report provides data on each of the companies with regard to their energy generation and supply mix, investment decisions, their annual profits and turnover, their policies and activities and how they have each contributed to CO_2 emissions in the UK. It also looks at participation in the EU ETS, renewable energy, combined heat and power (CHP), energy efficiency and energy services in particular.

The research was conducted for WWF by Innovest Strategic Value Advisors, a global research provider assessing non-traditional sources of financial risk and opportunity. Innovest also carried out the pilot report in 2005.

Companies in the survey

The common UK names and/or abbreviated names (in brackets) of the six companies are used interchangeably throughout the report. The companies examined in this study are listed below in alphabetical order:

- Centrica (British Gas)
- EDF Energy (EDF)
- E.ON UK (Powergen)
- RWE npower (npower)
- Scottish and Southern Energy (SSE)
- ScottishPower (SP)

The report excludes British Energy and BNFL. These two companies were not ranked due to the difference in the asset base between a nuclear power generator and the rest of the companies in the sample.

Methodology

Thanks to a significantly better response rate from all six power companies via interviews, the measurement of corporate performance on each criterion is improved, compared with last year.

In addition, the research was peer reviewed by external and internal experts. This enabled all aspects of the methodology to be assessed and agreed upon.

This study sought feedback from the six companies surveyed. We reviewed methodological reservations in the course of developing the final scoring matrix.

These factors have combined to produce an apparent inconsistency between the findings in 2005 and 2006. Two of last year's "laggards" (E.ON-UK and RWE npower) are now judged to occupy more leading positions on their combined scores while the 2005 leader, Centrica, has slipped to the lower half of the rankings. These new results may lead to probing questions as to the reasons for the changing positions. While the two reports cannot be compared directly, any differences in the rankings over the two years are explained further, later in this report.

Survey Results

Overall rankings

The following table summarises the main ranking results of the six main UK power companies according to each company's performance in relation to the assessment criteria used. The report shows only slight gradations in performance on many of the variables used by Innovest. It is therefore difficult to pick out one company as being overall sector leader across all, or a majority of, the variables analysed. Improved disclosure and participation by companies in this year's survey have facilitated a more balanced and detailed analysis. With this access to more comprehensive data, we have been able to undertake a more thorough and meaningful benchmarking exercise. All six companies occupy a leader position (i.e. scored highest) in at least one category, and ScottishPower and E.ON UK have an upper tier position in eight of the 10 categories. Overall, ScottishPower has the highest score across all categories, marking it out as a peer group leader this time.

Table 1. Overall assessment matrix

Variables \ Companies	Centrica	EDF Energy	E.ON-UK (Powergen)	RWE npower	Scottish and Southern Energy	Scottish Power
GREENHOUSE GASES						
GHG emissions reduction policy	☺	☺	☺	☺	☺	☺
Fuel switching	😐	😐	😐	😐	☺	😐
Total CO_2 emissions (latest year)	☺	😐	☺	😐	☺	☺
CO_2 emissions trend (over previous years)	☹	☹	☺	😐	😐	☺
ENERGY EFFICIENCY						
Consumer education / electricity demand management	☺	☺	😐	☺	☺	☺
Compliance with EEC-1 target	😐	☺	☺	😐	☺	☺
RENEWABLE ENERGY						
Renewable energy installed / consented	😐	☺	☺	☺	☺	☺
Renewable energy investments	☺	☹	☺	☺	😐	☺
Renewables Obligation compliance	☺	☺	☺	😐	☺	☺
CHP						
CHP capacity	😐	😐	☺	☺	😐	😐

Key to symbols in the summary table above:

☺ upper tier (score =>7)	😐 middle tier (score 5,6)	☹ bottom tier (score =<4)

Summary ranking

Figure 1 below shows that each company's weighted overall scores are grouped in a fairly narrow range. This is to a large extent explained by the fact that all power companies in this sample are subject to the same regulatory requirements, including the Renewables Obligation (RO), Energy Efficiency Commitment (EEC) and the EU ETS.

Utilities face non-compliance fines or financial disincentives (purchasing Renewables Obligation Certificates at high prices is one example of a financial disincentive) if they fail to meet a given environmental obligation. Therefore, over time, UK power generators will be likely to increasingly converge around a higher degree of compliance and approaches to climate change management, with decreasing variance in relative scores.

Differences between the scores and rankings in 2005 and the 2006 rankings are apparent. In the 2006 review, ScottishPower attained the highest weighted score and is therefore placed as the 2006 leader in terms of overall ranking. Last year's top-ranked company, Centrica, is now ranked near the bottom of the peer group (the reasons for the changes to this year's company rankings are explained in the summary section on methodology below). EDF Energy , however, remains the sector "laggard" in terms of overall weighted scores.

All the ranking charts in this report are based on a 0 to 10 scoring system, with 10 the highest score obtainable. Companies are ranked relative to one another in terms of their performance on all the different variables used. The bar charts show scores obtained either on individual variables or weighted average scores across a range of variables.

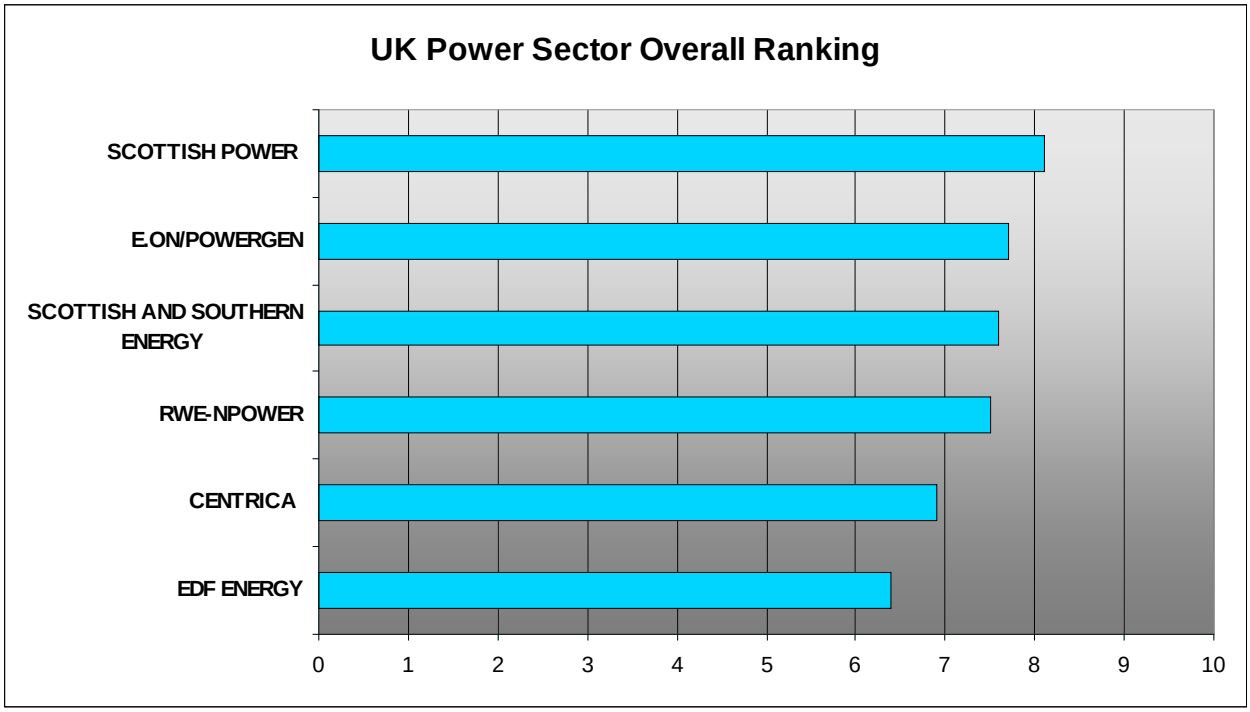

Figure 1. UK Power Sector Overall Ranking (2006 report).

UK power sector

Provisional data for 2005 shows that total UK CO_2 emissions are now just 5.3% below 1990 levels. Total emissions have increased by 2.3% since 1997 – the main culprit being the power sector, which has seen a 15% increase in emissions.[1] In 1990 the UK power sector was responsible for some 33% of the UK's total emissions. In 2005 it was responsible for 30% – but

[1] Energy Trends, March 2006.

this reduction occurred in the early 1990s as a result of the "dash for gas", and emissions have since been rising because of increasing electricity demand and a return to coal burn.

It is clear from the UK government's own figures that fossil fuels remain the dominant source of energy in the UK. In 2004, just 3.6% of the UK's electricity supply came from all sources of renewable energy. In terms of fuel use, most generation in the UK is coal-fired, with natural gas a close second. Declining North Sea gas reserves have raised concerns about energy security, as the recent gas dispute between Russia and Ukraine illustrated. Gas use will therefore be a major issue in decisions about future energy policies.

UK Renewables Obligation

The Renewables Obligation is the UK government's main mechanism for supporting renewable energy. Introduced in April 2002, it provides a market incentive for all eligible forms of renewable electricity by requiring licensed electricity suppliers to source a specific and annually increasing percentage of the electricity they supply from renewable sources. The current target is 5.5% for 2005/06, rising to 15.4% by 2015/16. It is expected that the Obligation, together with exemption from the Climate Change Levy for electricity from renewables, will provide support to industry of £1 billion a year by 2010. At the end of 2004, generation from renewable sources eligible under the Obligation stood at 3.1%. This rises to 3.6% if non-eligible sources are included.

EU Emissions Trading Scheme

The EU Emissions Trading Scheme (EU ETS) is a market-based mechanism which has been introduced across Europe with the aim of reducing emissions of carbon dioxide from power stations and heavy industry in the most cost effective way. Phase I of the Scheme began on 1 January 2005 and will run until 31 December 2007. Phase II will run from 2008 to 2012, to coincide with the first Kyoto Protocol commitment period.

The scheme works on a "cap and trade" basis. EU member governments are required to set an emissions cap for all installations covered by the scheme. Each installation is then allocated allowances for the particular commitment period in question. The number of tradable allowances allocated to each installation for any given period is set down in a National Allocation Plan.

Financial sector

Over the last two years, there have been significant financial impacts globally from extreme weather, higher than average incidence and strength of hurricanes such as Katrina (likely due to higher sea temperatures), wildfire, drought, heatwaves and flood events. Weather anomalies are costly to businesses and individuals, although insurers and re-insurers bear the brunt of the costs of the major damage. Insured and total property losses (US$45 billion and $107 billion globally in 2004, respectively) are rising faster than premiums, population or economic growth in the US and globally. Even after correcting for inflation, weather-related catastrophe losses in the US property/casualty sector have grown from a few billion dollars a year in the 1970s to an average of $15 billion a year in the past decade, punctuated by three peaks of more than $25 billion a year and a record high in 2004 that included $30 billion in hurricane losses alone.[2.]

Financial impacts also arise from:

- political and regulatory initiatives targeting significant carbon emitters;

[2] Ceres, Availability and affordability of insurance under climate change :a growing challenge for the US, Sept 2005.

- the development of emissions-sensitive technologies, products and services superseding those existing today; and

- shifts in consumer sentiment linked to a corporation's stance on climate change.

This makes it necessary for investors to improve their understanding of climate change risks and opportunities. In response, a number of initiatives have been launched by the financial sector.

In February 2005, for example, a group of 143 institutional investors with assets of US$20 trillion under management wrote to the 500 largest quoted companies in the world by market capitalisation, asking for disclosure of investment-relevant information concerning their greenhouse gas emissions. This was the third iteration of the Carbon Disclosure Project (CDP), launched in 2000, which aims to highlight good and bad carbon-management practice to enable corporate climate risk to be factored into investment decision-making.

The fourth CDP information request (CDP4) was sent on behalf of 211 institutional investors with significant assets under management to the chairmen of more than 1,900 companies on 1 February 2006[3].

The UN organisation, UNEP Finance Initiative, has also produced guidance documents for the financial community with respect to climate change responsibilities[4].

So far, UK financial impacts have been relatively limited. However, more than 1.25 million Londoners rely on the Thames and Barking Barriers, along with other flood defences (homes and businesses worth an estimated £80 billion are within the floodplain). The Chancellor of the Exchequer announced in July 2005 that he had asked Sir Nick Stern to lead a major review of the economics of climate change, so as to understand more comprehensively the nature of the economic challenges and how they can be met in the UK and globally. The review will report back by autumn 2006. This initiative demonstrates understanding of the need for hard figures to be put on climate-related impacts, in order to incorporate the costs and benefits of action to mitigate climate change more accurately into policy-making.

[3] www.cdproject.net

[4] www.unepfi.org/publications/climate_change/index.html

2. METHODOLOGY

Areas of analysis

Research clusters

During the comparative assessment of corporate greenhouse gas management strategy and performance among the six power companies in this study, we have focused on four main areas of analysis (research clusters):

- CO_2 (assessed as CO_2-equivalent) policy and emissions improvements;
- renewable energy programmes, capacity procurement for new renewables, ongoing renewable asset construction and present output;
- energy efficiency/demand-side management measures; and
- combined heat and power (CHP).

Two-stage research process

The research methodology in this report was detailed and had two stages:

- The first stage involved detailed research based on public disclosures by the UK power companies. The data search included (but was not limited to) the review of all corporate greenhouse gas emissions data and government databases covering emissions reduction compliance. By carrying out a diverse information search, this report aims to provide the most balanced and objective assessment of corporate climate change risk management performance.

- The second stage involved interviews with senior executives of the six power companies. The heads of environmental affairs or directors of corporate responsibility were also asked for one-hour telephone interviews. Specialists of equal rank and similar responsibilities were also approached.

Requests for interviews were accompanied by a written questionnaire which sought the disclosure of information not available from public sources. Individual company questionnaires ranged in length and depth because of the differences in climate change policy disclosure.

Companies were asked to confirm their interview participation within three weeks of the original contact. The data provided in the interviews was later integrated with publicly disclosed information to produce the combined rankings presented in graphic form.

Scope and improvement in information disclosure

All companies in the survey provided telephone interviews and written follow-up responses and clarifications within the timeframe given. This led to a significantly better corporate response rate compared with the 2005 disclosures.

The interview response rate for last year's survey was lower and the data made available for the 2006 survey is much more comprehensive. This has enabled a more detailed and accurate benchmarking of company policies and performance with respect to climate change risks and opportunities.

Calculating overall rankings

All companies in the sample were ranked against criteria listed below. This table also describes the variables on which companies were assessed and the measurement approach used.

Following this ranking process, ranking scores encompassing the four clusters – greenhouse gas, energy efficiency, renewable energy and CHP – were calculated. The combined ranking is derived by applying a weighted average to all other ratings in the report.

The *weighted* score is where we take into consideration all weights attributed to each variable and multiply a variable weight by the variable score for each company, after which the sum of weighted scores is divided by the weight per cluster. For example, the greenhouse gas cluster is attributed the weight (importance) of 32% relative to all clusters taken together, which assume the cumulative weight of 100%. Therefore, the sum of weighted scores in this cluster would be divided by 0.32 or 32%.

As an example of how weighting has been attributed, a lower weight was attributed to the "fuel switching" category because UK power utilities have a low capacity to switch from coal to natural gas due to the gas price growth; in addition, if they implemented biomass co-firing, power generators could reduce the power output due to the lower "burn capacity" generated by biomass relative to carbon-based fuels (coal, oil or natural gas). Therefore, the weight on this variable was lowered so as to avoid penalising companies with a limited rapid-switching capacity in favour of natural gas. Not lowering this score would also create bias in favour of companies such as Centrica that historically accumulated substantial gas-fired capacity for reasons not directly linked to the goal of reducing carbon dioxide emissions.

On the other hand, heavier weight was attributed to the evaluation of corporate CO_2 emissions reduction because electricity generators have a large playing field in this domain in terms of elaborating on and acting upon rather detailed, quantitatively-benchmarked and continuously improving emissions reduction targets. Expressed differently, emissions reduction achievements and the willingness to adhere strictly to emissions reduction guidelines represent the best reflection of corporate will and leadership.

Ranking system

Company ranking is carried out as follows. Computations provide measures of corporate performance, and these measures have different magnitudes depending on their importance. Each measure is compared on a like for like basis for every variable under consideration. For example, when researching CO_2 emissions, we look at tons of CO_2 emitted (tCO_2), where the total number of tCO_2 discharged by one power company is directly compared with tons of CO_2 emissions in the other five companies. The final ranking charts are presented as a relative score.

All scores range between 0 and 10, with 0 reflecting the worst performance and 10 the best. In case of a missing observation on a particular variable, a company with missing data is automatically assigned the default score of 5, as in case of the renewable energy investments variable for some of the six companies which deemed this information commercially sensitive.

Table 2. Definition of Variables and Measurement Technique: 2006 Methodology

Variable	Definition/Measurement
Greenhouse Gas cluster	**Greenhouse Gas cluster**
CO_2 emissions reduction policy	A set of programmes setting quantitative emissions reduction targets in a way that maximises to the fullest extent the use of every emissions management instrument available to utilities; high-quality policies also provide links to statistical reports proving the reduction of CO_2 emissions and progressively setting up tougher emissions reduction targets in full compliance with the national legislation.
Fuel switching	Changing primary energy input in electricity generation from more carbon-intensive coal to less carbon-intensive natural gas; this term also apples to biomass co-firing in coal-fired generation; the variable is measured either in KWh generated from coal versus gas or, if reported, in percentages of fuel switched. The data is divided by sales for standardisation.
Total CO_2 emissions	Emissions reductions/growth for most recent year for which data made available by company; measured in tons of CO_2-equivalent; the data is divided by sales for standardisation.
Total CO_2 emissions trend	Emissions of carbon dioxide, methane and other greenhouse gases from corporate operations and directly from electricity production. Where available, the data is reported for 2000-05, or for slightly shorter periods depending on time series provided by a company; it is reported/measured in tons of CO_2-equivalent. Information collected encompasses not only carbon dioxide, but also other types of greenhouse gases, which are all converted and presented in the form of the CO_2-equivalents. The data is divided by sales for standardisation.
Energy Efficiency cluster	**Energy Efficiency cluster**
Compliance with EEC-1 target	Percentage of a company's over-compliance with the first round of the UK EEC (2002-05). All British utilities have over-complied with their first EC obligation; this variable measures the difference in the "over-compliance" percentages. The percentages are divided by sales for standardisation.
Consumer education/electricity demand management	Size of customer pool covered by energy efficiency education programmes (number of customers) and/or expenditures (when reported) on customer energy

	efficiency education, including metering, training on benefits of insulation and/or installation of new energy-efficient appliances. Also measures the number of advisers and salary-associated costs reported by each company for the staff training consumers in energy efficiency measures. All data, reported in whatever format, is divided by sales for standardisation. This variable focuses primarily on residential/private and commercial customers, not the corporate ones.
Renewable Energy cluster	**Renewable Energy cluster**
Renewable energy installed/consented	MW of installed capacity, especially new additions installed in 2003-05 (the capacity still in the consent stage was not counted in the computation of this score; all consented capacity was counted); with few exceptions the companies did not release the investment data. The data is standardised by sales.
Renewables Obligation compliance	Percentage of the RO met by surrendering ROCs versus paying into the buy-out fund. The higher the percentage of ROCs surrendered by a given company, the higher is the score.
Renewable energy investments	Where the data on planned investments is disclosed, it is standardised by sales, and higher investments receive a higher score. However, most companies did not report planned investments. In the absence of the investment data, we looked at MW of consented capacity or planned capacity as disclosed by companies, in MW, adjusted by sales.
CHP/Technology cluster	**CHP/Technology cluster**
CHP capacity	MWe (electric capacity) and MWth (thermal capacity) installed adjusted by sales and, where available, investments in new CHP capacity in 2000-05 (also divided by sales); where available, also accounts for tons of CO_2-equivalent avoided by the installed CHP capacity.

Source: Innovest, 2006

Changes relative to the 2005 report methodology

In 2006 a number of changes in the research methodology were implemented in order to simplify the measurement criteria, placing more emphasis on quantitative and easily comparable criteria and reflecting a significantly better response rate by the power companies compared with our 2005 study. Below we provide a general description of several changes to the methodology that resulted in some shifts in scores on particular variables.

In 2005 our methodology was heavily dependent on qualitative information, in part because several companies were willing to disclose viewpoints without substantiating them with hard

data. We created a relatively complex methodology for score computations on a number of variables, which attempted to assign quantitative values and weights to incomplete company responses. In this approach, whenever a company response was not provided, we had to discard this variable from ranking, or use a proxy indicator for which we could find verifiable information.

Also in 2005, we paid close attention to comparing companies on the basis of their total volume of GHG emissions, including CO_2, CH_4 and all other GHG emissions (assessed as CO_2-equivalent). In 2006 we focused more on the improvements achieved by companies. This explains better scores for RWE npower and E.ON-UK and slippage in scores for EDF Energy and Centrica.

In 2005, to create comparable data as a basis on which to derive the rankings, all reported CO_2-equivalent emissions were adjusted by the total volume of electricity generation, where emissions and electricity output are deemed to be highly correlated. In simple terms, with certain exceptions explained by renewables generation and/or fuel switching, the more electricity a given company generates, the higher the total volume of its CO_2 emissions. However, in order to properly measure the *improvement* in corporate emissions reduction profile, it is necessary to divide the total rate of CO_2-equivalent emissions reduction (for all types of greenhouse gases) by another closely-correlated statistic. Sales volumes are connected with the volumes of GHG emissions, CO_2 emissions inclusive, in a *direct* manner because of various electricity purchasing agreements between independent power producers and utilities.

Volume of sales represents a better denominator and is used in our 2006 standardisation protocols. This statistical correction further differentiates the 2005 and 2006 results.

Due to poorer disclosure of EEC and project investment activities in our 2005 study, our ranking results were more heavily focused on company performance on renewables and on emissions intensity history. In both 2005 and 2006, Centrica has retained a leading position on its historically-low CO_2 emissions profile; the company also scored highly on its RO performance, which explains a ranking in favour of Centrica that was reported in 2005. Due to a more comprehensive data disclosure in 2006 and lower weights attributed to the current carbon emissions profile, this “positive bias” favouring Centrica has been reduced. That does not mean that in 2005/06 Centrica demonstrated poorer performance on all parameters (although its GHG [CO_2-equivalent] emissions increased). It means that other companies provided better disclosure on a range of variables. This enabled better calculations to be made, which in turn improved the company’s rankings.

Thanks to greater cooperation on the part of the power companies this year – partly due to WWF’s high-level discussions in order to improve dialogue – a greater volume of information not available to us in 2005 was verified. We were also able to collect additional data important for rankings, such as programmes managing investment in innovative GHG emissions reduction technologies and/or EEC-related consumer training measures. Such information is not always available in corporate sustainability, social and environmental reports, even if companies strictly adhere to the Global Reporting Initiative’s (GRI) guidelines.

These changes permitted us to simplify the methodology and focus to a greater extent on the hard numbers reported (or disclosed in the course of the interview) by the companies or on the information that could be easily verified by external sources – for example, on EEC-1 compliance percentages obtainable from the 2005 Ofgem report on this issue. That translated into a slightly larger number of criteria on the basis of which each company is evaluated and also into a change of variables selected for the study.

All these factors to a large extent explain the difference between the 2005 pilot and 2006 benchmarking reports and corresponding findings.

3. UK POWER SECTOR

Overview

Provisional data for 2005 shows that total UK CO_2 emissions are now just 5.3% below 1990 levels. Total emissions have increased by 2.3% since 1997 – the main "culprit" being the power sector, which has seen a 15% increase in emissions.[5] In 1990 the UK power sector was responsible for some 33% of the UK's total emissions. In 2005 it was responsible for 30% – but the reduction occurred in the early 1990s as a result of the "dash for gas", and emissions have since been rising because of increasing electricity demand and a return to coal burn.

Generation

Over the past five years it is clear from the UK government's own figures that fossil fuels remain the dominant source of energy in the UK. In 2004, 3.1% of the country's electricity supply came from renewable energy sources that are eligible for the Renewables Obligation. During the same period, 3.6% of the electricity supply came from all sources of renewable energy. In terms of fuel use, most generation in the UK is coal-fired, with gas a close second (see Table 3). However, declining North Sea gas reserves have raised concerns about energy security, as the recent gas dispute between Russia and Ukraine illustrated. Gas use will therefore be a major issue in decisions about future energy policies.

Table 3. Fuel use by the UK power sector (2004). Mtoe = million tonnes of oil equivalents

Fuel type	Generation (Mtoe)
Coal	31.3
Oil	1.14
Gas	29.1
Nuclear	18.2
Hydro	0.42
Other renewables	2.99
Other fuels	1.55
Net import	0.64
Total	**85.4**

Source: DTI DUKES 2005

[5] Energy Trends, March 2006.

Rising energy costs and supply concerns

Gas supplies to the UK have been tighter than normal in 2006, given high oil prices, diversion by certain suppliers of gas to other markets, low inter-connector pipeline capacity and low storage capacity. The reduced supply has inevitably raised prices.

For example, 17 million Centrica (British Gas) customers are facing higher bills after the company raised its gas and electricity prices by 22% from 1 March. The firm blamed the price hike on substantial rises in wholesale gas prices, up about 70% since September. The European Commission has said that some European energy firms were holding back gas supplies, driving up prices of imports into the UK.

The difficulty faced by Centrica and other UK gas suppliers is that the wholesale price they pay for gas keeps rising and they will have to pass that increase on to customers at some stage. The February 2006 wholesale price was 64p per therm. In 2005 the average price was 37p a therm, compared with an average of just 20p in 2003. Prices have therefore more than tripled over the past two years.

A variety of factors have contributed to these price rises. Most UK gas still comes from the North Sea but production has been declining faster than expected. As a result, the UK has had to import 5% of its total gas supplies. Meanwhile, the wholesale price of gas (which is often linked to the price of crude oil) has been driven higher by record oil costs.

Not only has imported gas become more expensive, but it is also harder to obtain. British Gas reports that transporting gas through the European pipeline network is a challenge because it is owned and run by a variety of national monopolies or semi-monopolies on the continent. These companies have tied up much of the pipeline capacity in long-term deals, so shipping gas from Russia to the UK, for instance, is not straightforward.

Environmental Regulations

UK Renewables Obligation

The Renewables Obligation (RO) is the UK government's main mechanism for supporting renewable energy. Introduced in April 2002, it provides a market incentive for all eligible forms of renewable electricity. The RO requires licensed electricity suppliers to source a specific and annually increasing percentage of the electricity they supply from renewable sources. The current target is 5.5% for 2005/06 rising to 15.4% by 2015/16. It is expected that the Obligation, together with exemption from the Climate Change Levy for electricity from renewables, will provide support to industry of £1 billion a year by 2010. At the end of 2004, generation from renewable sources eligible under the Obligation stood at 3.1%. This rises to 3.6% if non-eligible sources are included.

EU ETS

The EU Emissions Trading Scheme (EU ETS) is a market-based mechanism which has been introduced across Europe with the aim of reducing emissions of carbon dioxide in the most cost effective way. Phase I began on 1 January 2005 and will run until 31 December 2007. Phase II will run from 2008 to 2012, to coincide with the first Kyoto Protocol commitment period.

The scheme works on a "cap and trade" basis. EU member governments are required to set an emissions cap for all installations covered by the scheme. Each installation is then allocated allowances for the particular commitment period in question. The number of allowances allocated to each installation for any given period (the number of tradable allowances each installation will receive) is set down in a National Allocation Plan (NAP).

Phase I

Throughout 2004, the level of the proposed limit on British industry for the first phase of the scheme (2005-2007) rose steadily from 714 million tonnes of CO_2 (MtC) to 756 MtC. This latter figure was rejected by the European Commission on the basis that the UK had submitted its final allocation too late. After a protracted legal battle, the UK has finally accepted this decision and the total allocation for phase I is now set at 736 MtC.

Phase II

The draft UK NAP states that the cap will be set at a level of between three and eight million MtC less than "business as usual" projections for 2010. However, the lower end of the range would actually mean that industry would be allowed to pollute more than in the current phase of the scheme.

The European Commission released data on CO_2 emissions during 2005 from installations covered by the EU ETS on 15 May. This appeared to show that most member states have granted their industries overly generous carbon emissions allowances in the period 2005-07 and caused the price of carbon to plummet. Overall CO_2 emissions were 44 million tonnes below the 2005 quota[6]. The new data increases pressure on the Commission to be tougher when approving limits for Phase II. Stakeholders are encouraging the rejection of NAPs which do not show significant reductions compared with the previous compliance period.

Energy Efficiency Commitment

Under the UK Energy Efficiency Commitment (EEC), electricity and gas suppliers are required to achieve targets for promoting improvements in domestic energy efficiency. The EEC is aimed at contributing to the climate change programme by cutting greenhouse gas emissions.

At least 50% of energy savings must be focused on a priority group of low-income consumers in receipt of certain benefits and tax credits/pension credit. So it is expected that the EEC will also contribute to the alleviation of fuel poverty. The gas and electricity regulator Ofgem is responsible for administering the EEC, the first phase of which ran from 1 April 2002 to 31 March 2005. All solvent suppliers with an EEC obligation met their targets and started work early on the current EEC 2005-08, which requires about double the level of activity (Ofgem's review of the Energy Efficiency Commitment 2002-2005 is available on its website[7]).

The government intends to extend the EEC to 2011 and is working towards a review in 2007 that will inform the setting of the target for the EEC 2008-11. The review will involve discussions throughout 2006 with a wide range of stakeholders.

The EEC 2002-05 obligation was set at a level so that the cost to electricity and gas suppliers should not exceed the equivalent of £3.60 per customer per annum and per fuel. This figure was used to derive the total target of 62,000GWh, which was then divided among suppliers on the basis of customers per supplier. Suppliers are able to achieve EEC obligations through savings of electricity, gas, coal, oil or liquid petroleum gas (LPG). The savings from different fuels are standardised to take account of the different carbon content.

The savings that can be claimed for insulating a coal-heated home, for example, are much greater than for a gas-heated home. Energy-saving measures eligible within the EEC obligation include cavity wall insulation, professional and DIY loft insulation, condensing boilers, low-energy lighting and energy efficient appliances.

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[6] www.wwf.org.uk/news/n_0000002601.asp

[7] www.ofgem.gov.uk

The EEC obligation of 62,000GWh included some “dead weight” – energy efficiency measures that would have gone ahead without the stimulus of the EEC programme. While it is recognised that individual schemes may include a “dead weight” element, all schemes must include savings over and above this.

The corporate cost of carbon

The accepted wisdom in energy markets now is that constraints on GHG emissions (“carbon constraints”) being imposed on the European power sector will increase and have significant commercial implications for utilities and fuel suppliers alike.

With the implementation of the EU ETS, coupled with the Kyoto Protocol which came into force in February 2005, a key risk management challenge now faced by utility analysts is understanding the likely drivers of the price of CO_2. This will be a consideration for revenue forecasts in 2008-12, a period during which expected cash flow will be material to planned new power plant investment decisions.

4. RANKING RESULTS

The chart below reveals similarities shown as a narrow range in weighted overall scores for each of the six power companies in this year's study. This is to a large extent explained by the fact that all companies in this sample are subject to the same regulatory requirements, including the Renewables Obligation, Energy Efficiency Commitment and the EU ETS.

Utilities face non-compliance fines or financial disincentives such as purchasing Renewables Obligation Certificates at high prices if they fail to meet a given environmental obligation. Therefore, over time, UK power generators will be likely to increasingly converge around a higher degree of compliance and approaches to climate change management, with decreasing variance in relative scores.

ScottishPower attained the highest weighted score and is the 2006 leader in terms of overall ranking. Last year's top ranked company, Centrica, is now ranked near the bottom of the peer group (the reasons for the changes to this year's company rankings are explained in the summary section on methodology). EDF Energy , however, remains the sector "laggard" in terms of overall weighted scores.

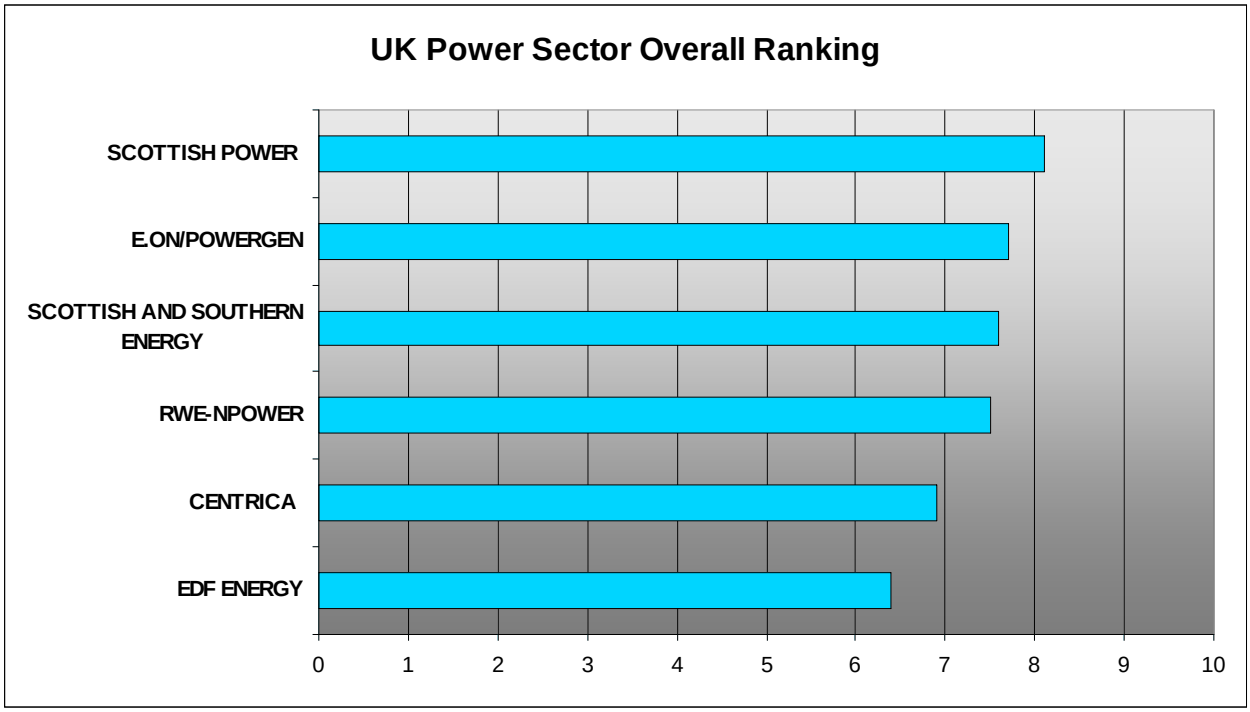

Figure 2. UK Power sector overall ranking

Greenhouse Gas cluster

In this cluster of climate change variables, we relied on corporate CO_2 emissions disclosures and interviews. We ranked companies using the following variables: comprehensiveness and coherence of GHG emissions reduction policy; fuel switching; total CO_2 emissions 2004-05; and CO_2 emissions improvements over a given period (2002-05 or 2002-04).

GHG emissions reduction policy

We examined the structure of corporate GHG management policies linked to the operational phase of the Kyoto Protocol and the start of carbon trading under the EU ETS. These developments in particular brought the "carbon market" closer to its fully operational mode. In this environment, UK utilities can now utilise a plethora of carbon risk-hedging mechanisms, while setting clearly presented emissions reduction targets for their electricity generation and operations.

The companies are also in a better position to disclose details about how they manage their carbon risks. This is due to their reporting CO_2 emissions reduction compliance to UK regulators and providing comprehensive reporting according to Global Reporting Initiative (GRI) guidelines. Finally, most UK utilities are ISO-14001-certified: this is an international accreditation which calls for a highly transparent and quantified disclosure of performance targets and the degree of target compliance.

Figure 3 below illustrates that in 2004-05 Centrica, ScottishPower and Scottish and Southern Energy had the most comprehensive and coherent GHG emissions reduction policies.

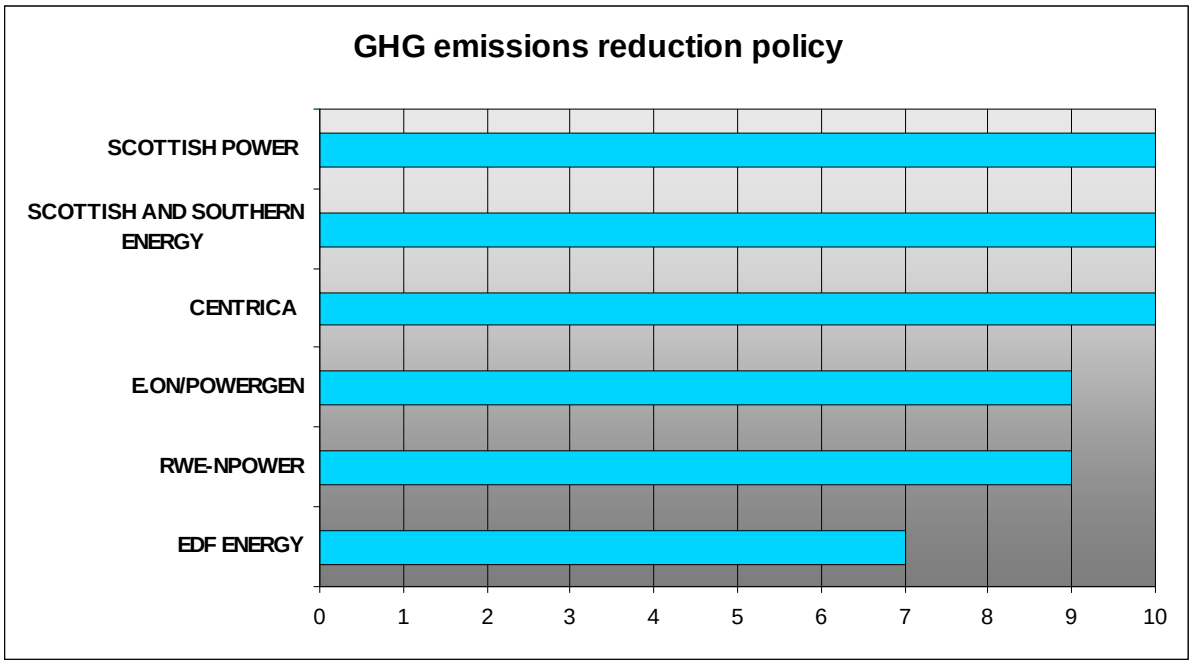

Figure 3. GHG emissions reduction policy

Higher policy scores were assigned to companies with strict internal and generation-specific GHG emissions reduction targets, where these companies:

- reported on the degree of compliance with such targets;
- presented the data in accordance with GRI guidelines;
- in terms of CO_2 equivalents, explained in detail carbon risk-hedging efforts in case their GHG emissions grew due to business expansion or because of a greater shift to coal-fired power generation; and
- in general, demonstrated a greater diversity of carbon risk-balancing actions.

Involvement in the EU ETS and the Clean Development Mechanism (CDM) contributed to our qualitative analysis of company performance.[8]

EDF Energy still lags behind the sector leaders with respect to the degree of comprehensiveness and clarity with which the company discloses its GHG management policy; EDF Energy could benefit from adopting the strict industry GHG reporting guidelines.

Fuel switching

Given that fuel switching towards natural gas reduces GHG emissions, we wished to establish which companies were able to stretch the boundaries of utilising gas combustion capacity. At the same time, considering rising natural gas prices for UK suppliers and consumers, we also investigated the degree to which utilities implemented biomass co-firing and/or any other modalities of augmenting their fuel mix in order to reduce their CO_2 emissions. Considering the constraint of rising gas prices, we attributed a smaller relative weight to this variable in calculating the overall carbon risk management score.

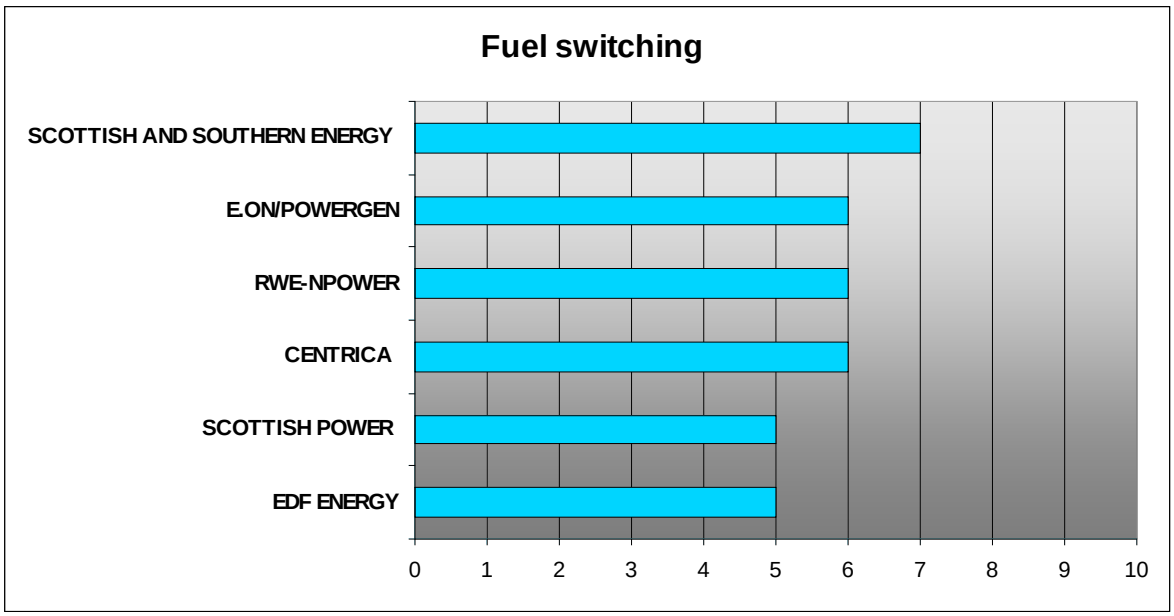

Figure 4. Fuel switching

None of the companies was able to effectively utilise this modality of carbon risk management due to the lack of economic incentives that would have offset the effects of increasing gas prices. Scottish and Southern Energy's higher-than-average score on this criterion is explained by its detailed disclosure of its co-firing activities and its combustion efficiency upgrades.

In 2005, Scottish and Southern Energy reported investing around £20 million in facilities to increase the co-firing capacity at both its coal-fired stations. The installation of new direct injection burners at the stations is expected to enable them to generate about 1,500 GWh a year

8 The CDM allows companies to invest in low emissions projects in developing countries which are not bound by the Kyoto Protocol, and claim these credits under the EU ETS.

of output, qualifying for Renewables Obligation Certificates. The work to install the burners is expected to be completed by the end of the financial year 2005-06.

Total CO_2 emissions

This metric refers to the quantity of CO_2-equivalent (CO_2-e) emissions per 2004-05 sales (sales expressed in million £). Centrica, ScottishPower and Scottish and Southern Energy were top ranking with respect to their low carbon intensity in 2005 (in $MTCO_2e$/TWh and/or $MTCO_2e$/million £ in sales).

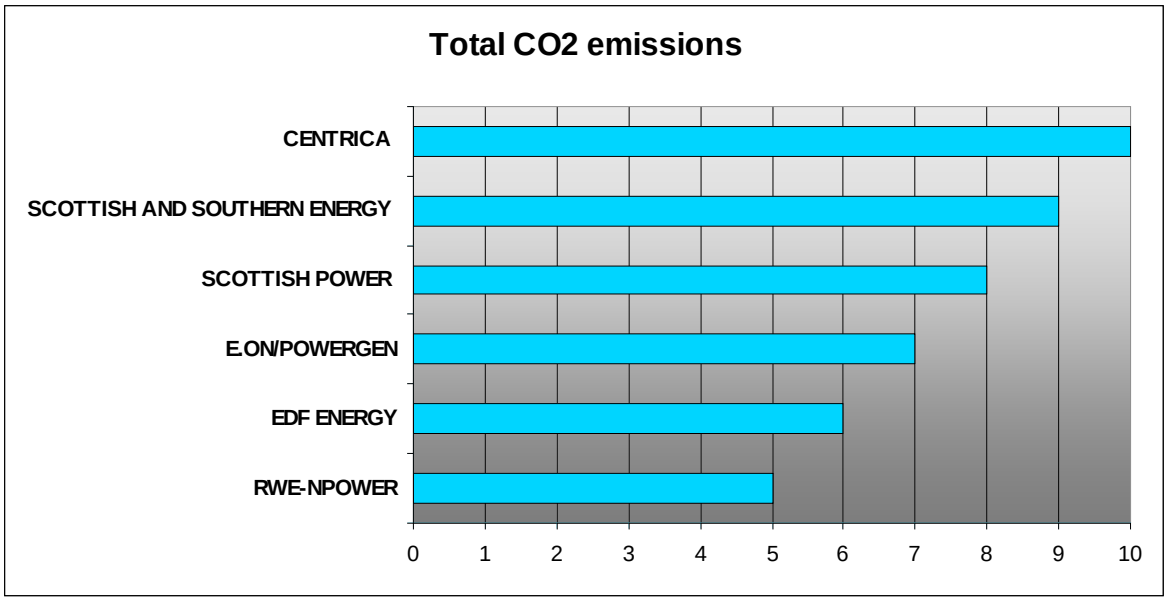

Figure 5. CO_2 emissions. Centrica, SSE and SP have low carbon intensity of electricity production

CO_2 emissions trend

The 2003-05 CO_2 emissions show individual companies' aggregate contribution to the total pool of national CO_2 emissions. This measure illustrates the emissions reduction progress over the past three years.

In general, from 2003 to 2005 (or 2002 to 2004, depending on data availability) UK power utilities showed no substantial improvements in their emissions, and overall sector GHG management leaders such as Centrica have less than optimal performance on this criterion. This may be explained by the limited ability to practise fuel-switching, the time-lag between the initial investment in renewables capacity development and the commencement of the actual operation of new facilities, as well as by growing national electricity demand.

This result also demonstrates the importance of market flexibility mechanisms, such as the EU ETS and/or Joint Implementation (JI) and the Clean Development Mechanism (CDM) as these are meant to reduce internal compliance pressure on UK electric utilities.

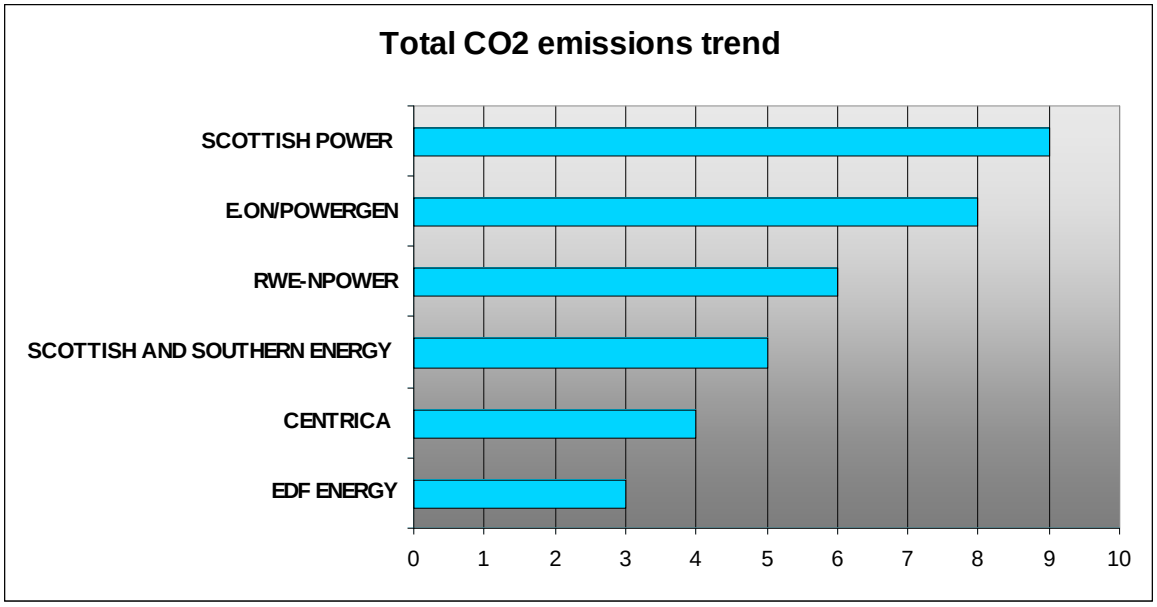

Figure 6. CO_2 emissions trend

ScottishPower, E.ON-UK (Powergen) and RWE npower made the best emissions reduction improvements, especially considering the relative coal intensity of their generation portfolios. It can be seen from the following table that Centrica's CO_2 emissions grew from 2000 to 2004.

Table 4. Total CO_2e emissions from electricity generation and other operations, 2000-04, Centrica, $MTCO_2e$

2000	2001	2002	2003	2004
453,215	480,138	406,805	519,020	584,039

Source: Centrica, 2004 Sustainability Report

Here it is observed that Centrica's CO_2e emissions have grown by almost 29% over the five-year period. Only in one year, 2002, did Centrica show a net reduction of CO_2e emissions. However, EDF Energy ranks lowest on this criterion due to increasing CO_2 emissions.

Energy Efficiency cluster

Looking at energy efficiency criteria, we benchmarked corporate performance with respect to compliance with the UK Energy Efficiency Commitment in 2002-05 (EEC-1) and consumer training in energy efficiency measures (meaning both the magnitude of training activities and appropriate investments, where applicable).

It is important to stress that the EEC-1 targets include provision of energy services (among other initiatives). For example, actions recommended under the EEC include wall cavity insulation, delivery/installation of low-energy lamps, installation and management of various heating and appliance measures reducing energy consumption.[9]

[9] Defra. 2004. "A Review of the Energy Efficiency Commitment to the End of the Second Year; A Report for the Secretary of State for Environment, Food and Rural Affairs" (July 2004, Document 178/04, p. iii).

Due to lack of detailed data provision by companies, to the commercial sensitivity of information pertaining to investments in the past EEC-1 commitments, and/or the ongoing EEC-2 activities, we could not benchmark power companies in terms of their EEC-1 investments or the degree to which these activities led to reduction of CO_2 emissions.

Compliance with EEC-1 target

Figure 7 below shows corporate ranking with respect to power sector performance on EEC-1, as documented in corporate and regulator (Ofgem) reports on the Energy Efficiency Commitment of UK electricity providers.

To rank companies on this indicator, we compared the percentage of their "over-compliance" with the EEC-1 (where the targets were already adjusted by the number of customers each company serves) and the range of services each company offered.

The highest degree of energy efficiency performance for the EEC-1 was noted for EDF Energy, Scottish and Southern Energy and ScottishPower, followed by Powergen. On this variable, Centrica and npower fared less well.

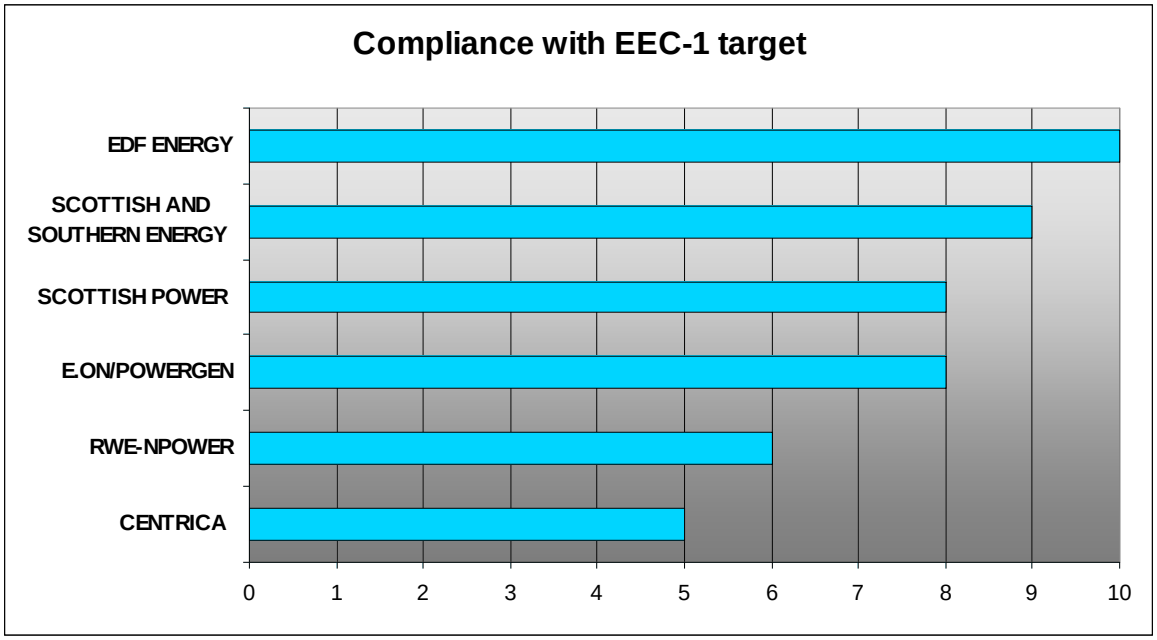

Figure 7. EEC-1 target compliance

Consumer education/electricity demand management (energy services)

With respect to this variable, Scottish and Southern Energy performs well, but three other companies are close behind. SSE says it provides a comprehensive energy advice service for domestic and commercial customers. This includes access to trained energy advisers on an energy advice line, a tailored energy advice report and home visits for vulnerable customers. Training 60 advisers costs £1.75m for each year. This is in addition to salary and related costs – these are difficult to split out accurately but will be of the same order of magnitude as the training costs.

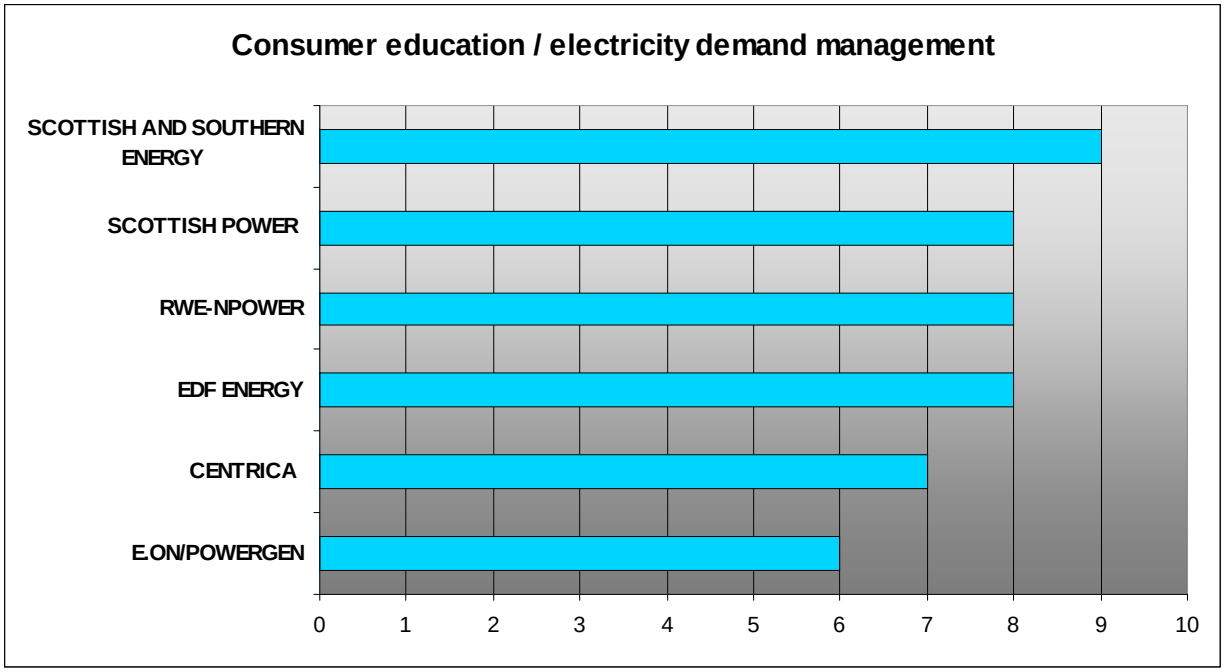

Figure 8. Consumer education, electricity demand management incentives (energy services)

Renewable Energy cluster

This area of analysis shows the largest variance in terms of company performance. This is partly because of the large number of variables employed in the renewable energy benchmarking exercise, and because of differences between the six power companies.

Acquisition of internal renewable generation capacity can be seen as one of the leading long-term instruments for reducing carbon risk exposure. In other words, the amount of CO_2 emissions released by each utility is a function of its type of generating capacity, whether renewables or fossil fuels.

Emissions trading is another critical predictor of corporate CO_2 emissions risk exposure, but due to the commercial sensitivity of the 2005 data related to company hedging through emissions trading, we could not accurately rank companies in this respect. Hence the focus was on renewables capacity data, which is reported in a more transparent manner. We therefore tracked power company performance in relation to:

- the size and type of installed and consented renewable energy facilities (including facilities already under construction), adjusted by sales to control for the size of operations;
- percentages of Renewables Obligation compliance achieved by generating renewable power/purchasing it from independent power producers versus paying into the buy-out fund; and
- planned renewable energy investments (where disclosed).

Renewable energy capacity installed or consented, with 2004-05 additions

On this criterion, Scottish and Southern Energy, RWE npower and E.ON-UK (Powergen) are sector leaders. SSE revealed in an interview with us that it has almost 1,400MW of plant which is generating electricity from renewable sources in addition to biomass. This largely comprises hydro-power stations and two wind farms. SSE has invested £250 million in refurbishing its hydro-electric stations and in developing new hydro-electric and wind farm sources. Refurbishing hydro-electric plant extends their useful life for several decades and increases their average output of electricity by around 5%. During 2004/05, refurbishment of 95MW of hydro capacity was completed, taking the overall total of refurbished capacity to 370MW.

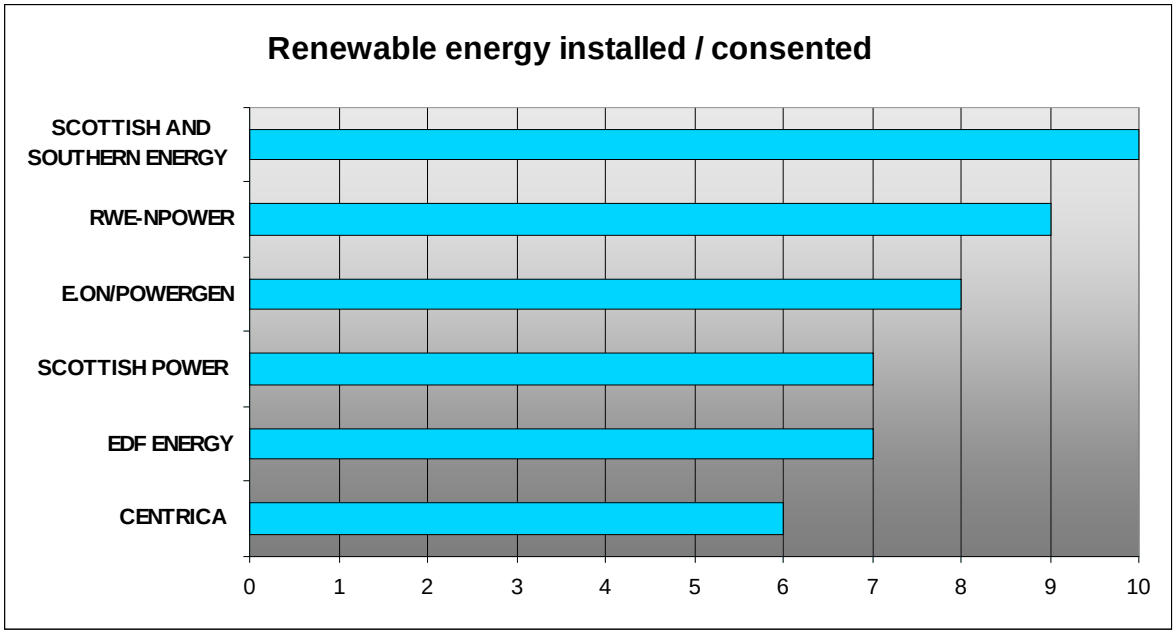

Figure 9. Total installed, consented and planned renewable capacity

Renewables Obligation (RO) compliance

Centrica and SSE ranked highest in RO compliance, Centrica in terms of meeting its RO without payments into the buy-out fund. Meeting the RO through the surrender (or retirement) of ROCs is deemed important as this promotes further investment in renewables and assists in the development of the ROCs market.

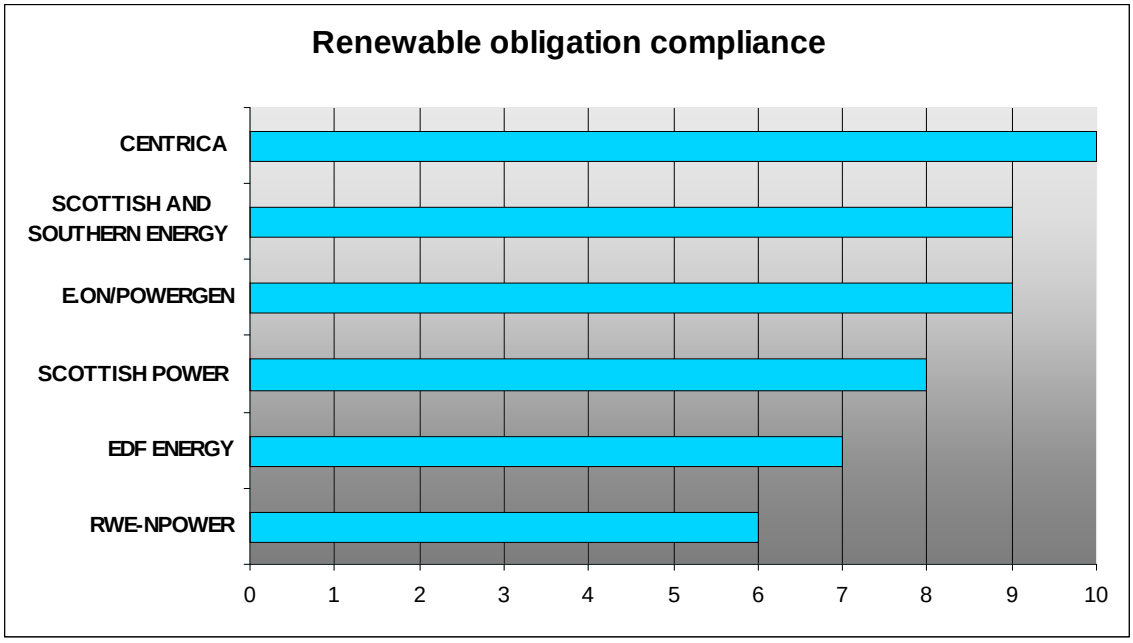

Figure 10. Renewables Obligation compliance

The companies contributing heavily to the RO buy-out fund are found towards the lower end of this scoring range. The scoring here favours ROCs/SROCs purchasing, as this strategy is seen as conducive to the development of renewable energy independent power producers and to the creation of market liquidity.

Renewable energy investments

ScottishPower and Centrica scored highest here (bearing in mind the less than full data disclosure across the companies). In its 2005 sustainability report, ScottishPower stated that in the UK it is supporting full commercial trials of the Pelamis wave energy converter at the European Marine Test centre in Orkney.

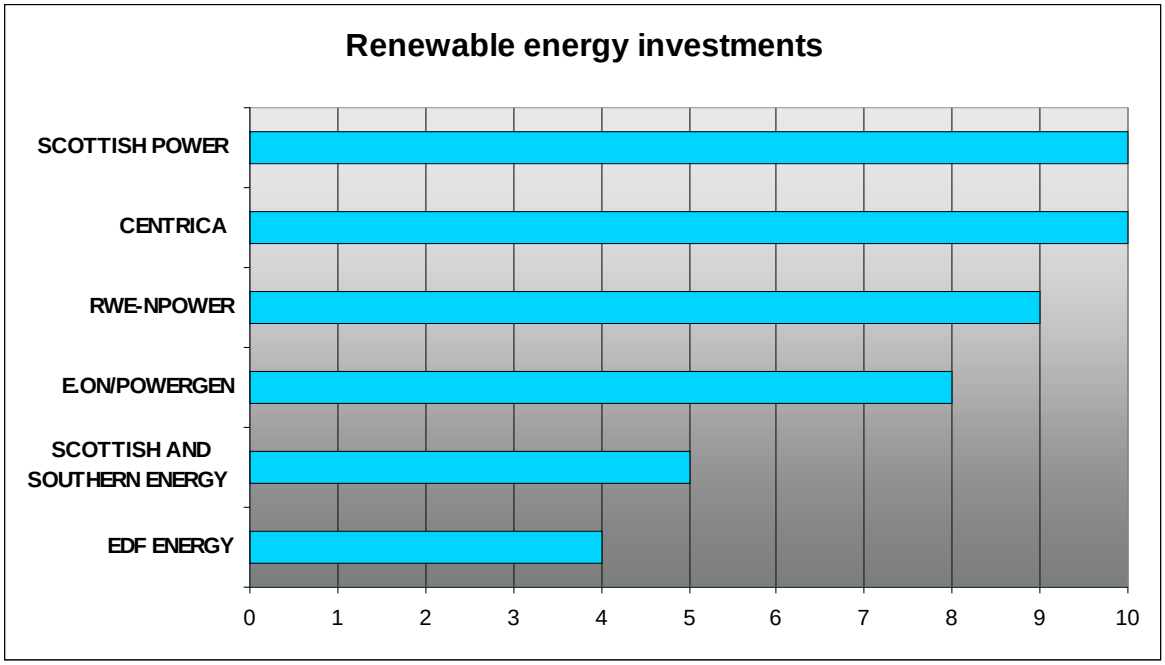

Figure 11. Renewable energy investments

Combined Heat and Power (CHP) Cluster

CHP capacity

To relate CHP assets to CO_2 emissions reductions, we obtained data on existing capacity. Our ranking of the CHP effort remains marginal as it focuses only on a single variable – the current installed capacity of CHP. This is due to the fact that UK power generators continued to insist that augmenting their CHP capacity would not represent a solution to the rising carbon emissions problem because CHP needs to reach a very high efficiency threshold to trigger a meaningful emissions reduction. We reported this in our 2005 report, but other barriers to CHP uptake are likely to exist, too.

Higher CHP capacity is a characteristic of the early CHP market entrants, which also tend to be larger-capitalisation companies. Current energy market conditions provide no incentive for developing additional CHP capacity in the UK.

RWE npower and E.ON-UK (Powergen) are the leaders in their current operating CHP capacity.

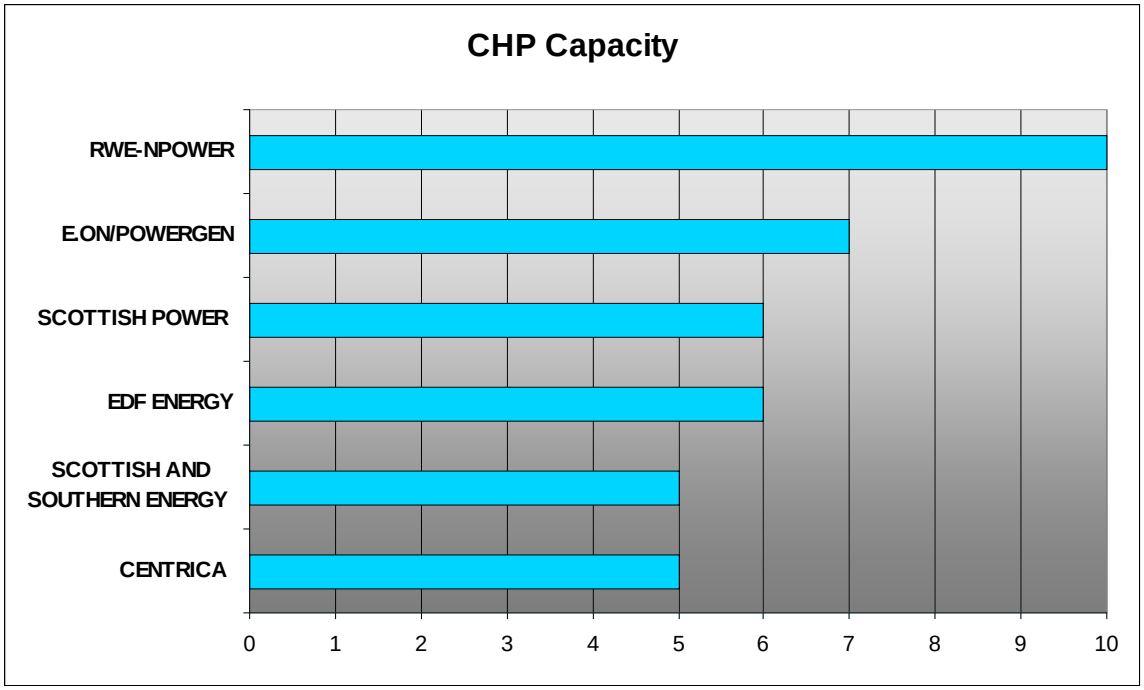

Figure 12. currently installed CHP capacity

5. COMPANY PROFILES

This chapter summarises the overall findings which helped to inform and contributed to each company's ranking position. It also compares the 2005 and 2006 ranking results.

Centrica

In 2005 Centrica led the UK power utilities in terms of its performance on emissions management categories. We have already explained a number of changes that have led to the overall shift in the ranking approach which have placed Centrica lower in this year's study.

It is important to emphasise that this year, Centrica provided a more limited response to our interview than in 2005, which could have marginally affected its score on the basis of disclosure. But its lower score is explained primarily by our placing a stronger emphasis on the recent CO_2 emissions record, while we attributed lower significance to the carbon-intensity of its existing assets. We also placed greater emphasis on the installed and/or consented renewable energy capacity, not the planned one. Centrica retains the leading position in terms of pledged investment in renewables, but its actual generating capacity remains lower than average regardless of its ability fully to meet its RO through ROCs surrender.

However, the 2006 results should not be interpreted as a relative failure of Centrica's climate change management programmes. In fact, its GHG management policy and its participation in JI/CDM and internal energy efficiency measures are among the best-in-sector. Centrica has a number of programmes to manage its increasing CO_2 emissions, but even so, those emissions have continued to increase. This gives rise to a change in our 2006 scoring results. Centrica's 2006 interview disclosures did not demonstrate that the company had established a sufficient safety net of programmes that would offset the growth of CO_2 emissions because sizeable planned investment in renewables does not automatically translate into offsetting CO_2 emissions growth. This is especially so because Centrica is already gas-intensive in terms of its highly-efficient electricity generating asset portfolio, which leaves little room for fuel-switching at its operating plants.

Centrica continues to have the best-in-sector carbon intensity of electricity generation, which was inherited from its previous policy of investing in gas-fire assets. It has no additional capacity to practise fuel-switching, although the company reported having looked into a number of co-firing options. In the absence of fuel-switching capacity, its 2003-04 CO_2 emissions have grown by approximately 12%, but they fluctuated during the year. We computed the rate of change of Centrica's CO_2 emissions between 2000 and 2004 and concluded that it did not show the required improvement in its emissions profile to retain its position as the sector leader, regardless of the benefit it receives from the gas-fired generation:

Table 5. Centrica's CO_2 emissions 2000-2004

Years	Change in Tons CO_2e	Base year emissions, TCO_2e	Rate of change, TCO_2e & Percentages
2000-2001	26,923	453,215	0.0584; or +6%

2001-2002	(-73,333)	480.198	(-0.1527), or (-15%)
2002-2003	112,215	406,805	0.2758, or 28%
2003-2004	65,019	519,020	0.1252, or 12%

Source: Innovest, 2006

EDF Energy

In 2005 EDF Energy occupied fourth position in the overall sector scoring. It received the highest score on its EEC-1 over-compliance, where it has exceeded the EEC-1 target by 74% – larger than any other UK electric utility. In addition, in 2005 EDF Energy Trust (which was commended in our previous report) continued its successful operation aimed at fuel-poverty alleviation.

Also on the positive side, in 2005 EDF Energy, under the umbrella of EDF Group activities, progressed in offsetting its GHG emissions through investment in CDM projects. EDF Energy reported having investigated a number of JI and CDM developments, although it has not yet concluded specific deals; all CDM activity is now reportedly consolidated into a single JI/CDM group entity at the level of EDF Trading in the UK.

EDF Energy has also progressed on committed investments in renewable energy, whereas in 2005 the company reported more than 200MW consented. Currently the company has only 4MW of renewable capacity operational – the lowest among all electric utilities in the UK. EDF Energy recognises this shortcoming and has reported aggressive efforts to increase its renewable generation in future.

Despite this progress, we place EDF Energy at the lower end of the ranking spectrum because of its continuing increase in greenhouse gas emissions, its limited installed renewable generation capacity and its lack of fuel-switching activity (the company claims it does not have such capacity). In 2005, EDF released the following emissions data:

Table 6. CO_2 emissions from electricity generation, 2002-2004**

	2002	2003	2004
CO_2 emissions, Kt/TWh	620	670	800
CO_2 emissions, total kilotons	15,000	17,000	20,000

Source: www.edfenergy.com/report/safe.html

**no data was made available for 2005.

To date, it seems that EDF Energy does not present a coherent, target-oriented GHG emissions reduction policy. This is a potential concern given that quantitative targets have long been the norm in greenhouse gas emissions management.

EDF Energy has very limited CHP activity. However, a probationary project agreement was signed with Imperial College, London, where EDF Energy's plant will provide heating, hot water and electricity for the college and campus. It also operates a CHP plant at Thames Valley Power, Heathrow Airport, where it serves one cargo terminal.

In summary, EDF Energy could benefit from streamlining its emissions reduction strategy and assigning specific quantitative benchmarks to achieve the reduction of CO_2 emissions, using a variety of means.

E.ON-UK (Powergen)

In our 2005 report, E.ON-UK received the second poorest overall score. It did not participate in last year's information interviews. By contrast, this year we commend E.ON-UK for its speedy, transparent and exhaustive disclosure of most of the required information.

In 2005, E.ON-UK was ranked in a low position for its slow progress in reducing its CO_2 emissions, its lower than average EEC-1 compliance progress and its average to below-average performance on all other indicators. Now, it is ranked second overall and has published data demonstrating emissions reductions in 2003-04 of approximately 2% (no data was made available in 2005). From 2000 to 2004 E.ON-UK's emissions reduction record showed a volatile pattern:

Table 7. Rates of change in CO_2 emissions, E.ON-UK, 2000-04 (MTCO2e)

2000-01	2001-02	2002-03	2003-04
-0.065 = -7%	0.0139 = 1%	0.1185 = 12%	-0.0245 = -2%

In the course of our interviews, E.ON-UK disclosed a significant number of programmes effectively cancelling out the volatility of CO_2 emissions. These resulted in higher scores. One measure is its participation in the EU ETS as well as aggressive hedging against emissions volatility at the group level through the CDM, where E.ON-Germany invested in one of the latest larger-scale CDM projects (an HFC destruction project in India, estimated to reduce up to 1.75 $MTCO_2e$ between 2006 and 2012; the project is in the process of registration by the CDM Executive Board).

E.ON-UK also revealed a large-scale "carbontech" investment programme encompassing increased CHP efficiency, advanced gas turbine (GT) technology (in collaboration with Siemens), prototype tidal power generation and very advanced clean-coal research (where E.ON-UK claimed that, in principle, the technology tested could reduce CO_2 emissions from coal- and gas-fired power plant by 80%). What further favourably distinguished E.ON-UK from its industry peers is the claim that the company has been "an *individual* and *primary* investor in such technologies", which would place it in a highly advantageous position. Considering the large scale of emissions reduction potential from commercialising and implementing such technologies at its power plants, E.ON-UK has been getting more successful in managing the volatility of its carbon emissions.

E.ON-UK has over-achieved its EEC target by more than 50%, which still places it behind most of its competitors in terms of the actual percentages – but even so, the company has fully complied with its regulatory obligation.

In 2006 E.ON-UK has more than 490MW of installed and consented renewable capacity, which places it slightly below Scottish and Southern Energy and RWE npower in terms of its renewable generation potential. In line with a large renewables potential, E.ON-UK has met about 90% of its RO through ROC surrender, which placed it second, after Centrica, with regard to its ability to generate renewables through internal investments.

RWE npower

In last year's report, RWE npower was in bottom position due to slow progress in reducing its carbon dioxide emissions, sub-optimal development of new renewable energy assets relative to its peers, and its lower than average EEC performance. This year, the company has attained higher scores for greenhouse gas abatement policy, better than average consumer training in energy efficiency and a diverse portfolio of "carbontech" R&D (at the UK level).

With regard to the latter criterion, RWE npower operates close to 270MW of offshore wind capacity, 55MW of hydropower generation, 207MW of onshore wind capacity and it has three power stations co-firing biomass (the latter with a combined biomass capacity of around 35MW). When adjusted for volume of sales, this renewables operating capacity places RWE npower second after Scottish and Southern Energy in terms of standardised operating and consented capacity. Since we attribute significant importance to the renewable energy cluster, the overall score of RWE npower has risen in 2006.

It is also worth mentioning that, although RWE npower did not provide detailed data on its activities on the CDM and/or JI, we credited the group for undertaking a set of early actions on this emissions reduction tool since it participated in the IBRD's Prototype Carbon Fund and other carbon emissions offsetting instruments. And it is important to highlight that, according to the disclosure presented in the latest RWE npower Sustainability Reports (2003-04), the company's CO_2 emissions stabilised at around 23.1 $MTCO_2$ due to reduced electricity generation at the Didcot A power station in 2004 (the emissions data for 2005 was not made available).

ScottishPower

In our 2005 report, ScottishPower was ranked third after Centrica and Scottish and Southern Energy. This year, the company reached the top of the ranking chart due to a combination of performance achievements. These included balanced GHG management policy and strategy, consistent progress in continuously cutting its CO_2 emissions, excellent results related to managing operating energy consumption, and a strong commitment to renewables investment.

ScottishPower still has some space to expand its renewable generation capacity if it is to catch up with Scottish and Southern Energy, but it claims that £1 billion has been earmarked until 2010 for commissioning and operation of new renewable capacity, with an additional £400

million planned for investments in renewables-supporting distribution and transmission networks.

For the second year ScottishPower was singled out for its reduction of CO_2 emissions by more than 11% (based on UK data), despite its relatively coal-skewed generating portfolio. In 2005 we mentioned that ScottishPower had historically exhibited one of the highest carbon intensities of power generation in our sample; in 2006 we single out this company for its ability to address this inherited shortfall aggressively.

In 2006 ScottishPower disclosed participating in a diversified group of "cleantech" R&D programmes ranging from clean coal (non-sequestration) and micro-PV to the commercialisation of the tidal power and bio-diesel-powered CHP. In terms of its investment in carbon technology initiatives, ScottishPower is ranked second after E.ON-UK, on a par with RWE npower. In sum, we have found that ScottishPower has launched a highly diversified and well-balanced approach to managing its exposure to greenhouse gas emissions in general and to carbon dioxide in particular.

Scottish and Southern Energy (SSE)

In our 2005 report, Scottish and Southern Energy was ranked third overall after Centrica. This year it did not participate in an information interview; instead, it provided a written response to our inquiries, and its transparent Sustainability Report enables us to better evaluate how to place the company in our overall ranking distribution.

Throughout the past year, SSE maintained its leading rank with regard to the total installed/planned renewable capacity, fuel switching record (through high-efficiency co-firing) and 2002-05 performance on EEC-1, where it exceeded its energy efficiency target by 65%. In this latter respect, SSE presented exemplary data on the actual GHG emissions savings achieved as a result of implementing its energy efficiency measures:

Table 8. EEC-1 compliance: annual CO_2 savings and lifetime carbon savings (Ofgem-approved)

Annual Carbon Savings (tC/a)	
Priority	= 10,660.21661
Non-priority	= 4,085.038731
Lifetime carbon savings (tC)	
Priority	= 127,922.5993
Non-priority	= 81,700.77463

Source: Scottish and Southern Energy Sustainability Report, 2005

SSE's summary scores on energy efficiency measures are higher than average. But its score was lowered in 2006 due to the continuing increase of its CO_2 emissions:

Table 9. Scottish and Southern Energy GHG emissions, 2000-05 MTCO$_2$

	2002	2003	2004	2005
Total	**14.30**	**16.11**	**16.65**	**25.44**

Source: Scottish and Southern Energy Sustainability Report 2005

The company reported that most of its CO_2 emissions increase was because it owned 100% of the coal-fired Medway Power Station throughout the year, compared with just five months in 2005. SSE justified its shift towards more coal-intensive production thus:

> *"The amount of CO_2 per KWh supplied to customers by SSE was 0.439 kg in 2004/2005 relative to 0.360kg in 2003-2004. Overall, carbon dioxide emissions from generation of electricity supplied by SSE were 25.44 million tons in 2004/2005, compared with 16.7 MT in the previous year. This was due to the need to supply electricity to a significantly greater number of customers, the result of growth in SSE's supply business."*[10]

Scottish and Southern Energy's score was also reduced due to the lack of disclosure about its EU ETS trading position. In fact, it remains the only company in our sample that disclosed no interest in international project-based emissions trading mechanisms.

[10] Scottish & Southern Energy, 2005 Sustainability Report.

6. CONCLUSIONS AND RECOMMENDATIONS

Summary of Rankings

ScottishPower attains the highest weighted score in this review, and is the 2006 leader in terms of overall ranking. Last year's leader, Centrica, is now ranked near the bottom of the peer group. EDF Energy remains the sector "laggard" in terms of overall weighted scores (see Figure 13 below).

Figure 13 reveals that weighted overall scores for each power company are grouped in a fairly narrow range. This is to a large extent explained by the fact that all companies are subject to the same regulatory requirements, including the Renewables Obligation, Energy Efficiency Commitment and the EU ETS.

Utilities face non-compliance fines or financial disincentives such as purchasing Renewables Obligation Certificates at high prices if they fail to meet a given environmental obligation. Therefore, over time, UK power generators will be increasingly likely to converge around a higher degree of compliance and approaches to climate change management, with decreasing variance in relative scores.

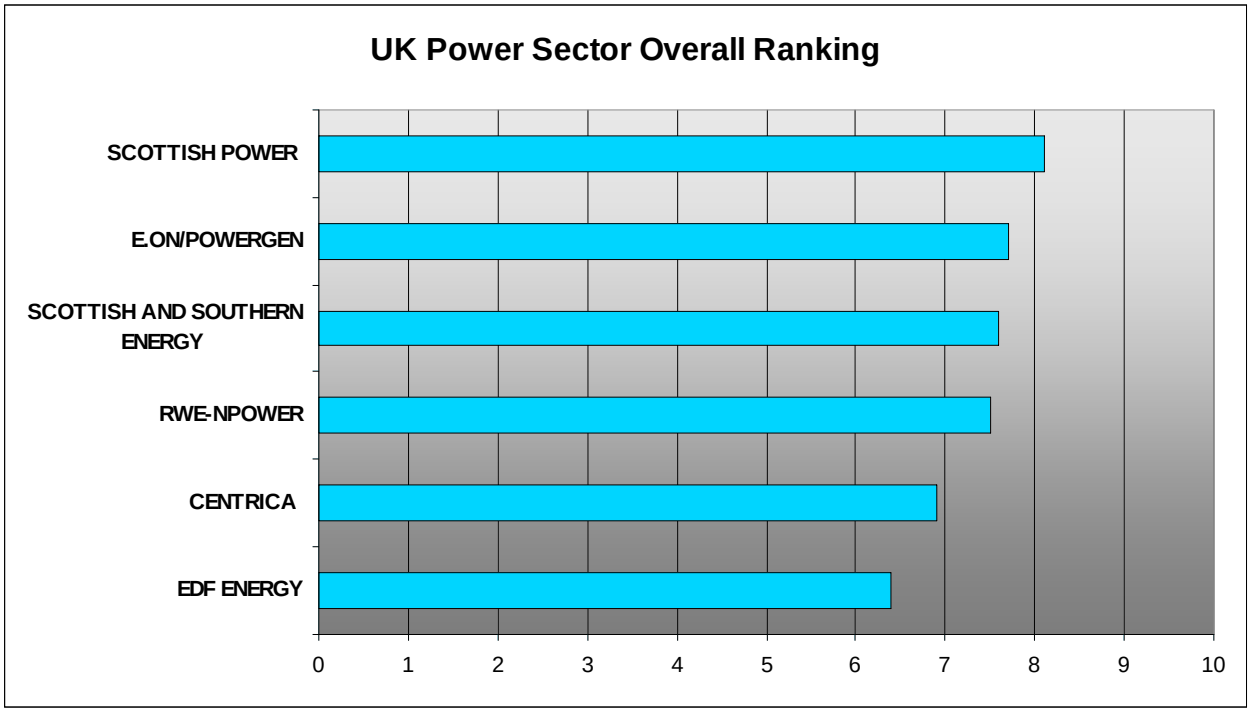

Figure 13. Overall ranking

The charts below show company positioning according to each of the three main research clusters:

Greenhouse Gas cluster

The scoring in Figure 14 reflects corporate performance on all variables discussed in the Greenhouse Gas cluster. These include CO_2 emissions management policy, fuel switching, total CO_2 emissions, and CO_2 emissions improvements in 2004-05.

ScottishPower goes to the top of the ranking chart due to a combination of performance achievements, including balanced GHG management policy and strategy and consistent progress in continuously cutting its CO_2 emissions. E.ON-UK also demonstrated leadership in managing its carbon risks.

EDF Energy, however, was found to lag behind sector leaders again. It demonstrated particularly poor performance in terms of managing its CO_2 emissions between 2003 and 2005: indeed, the company disclosed that its CO_2 emissions have continuously increased. EDF Energy also still lags behind sector leaders with respect to the degree of comprehensiveness and clarity with which it discloses its GHG management policy; it could benefit from adopting the strict industry GHG reporting guidelines.

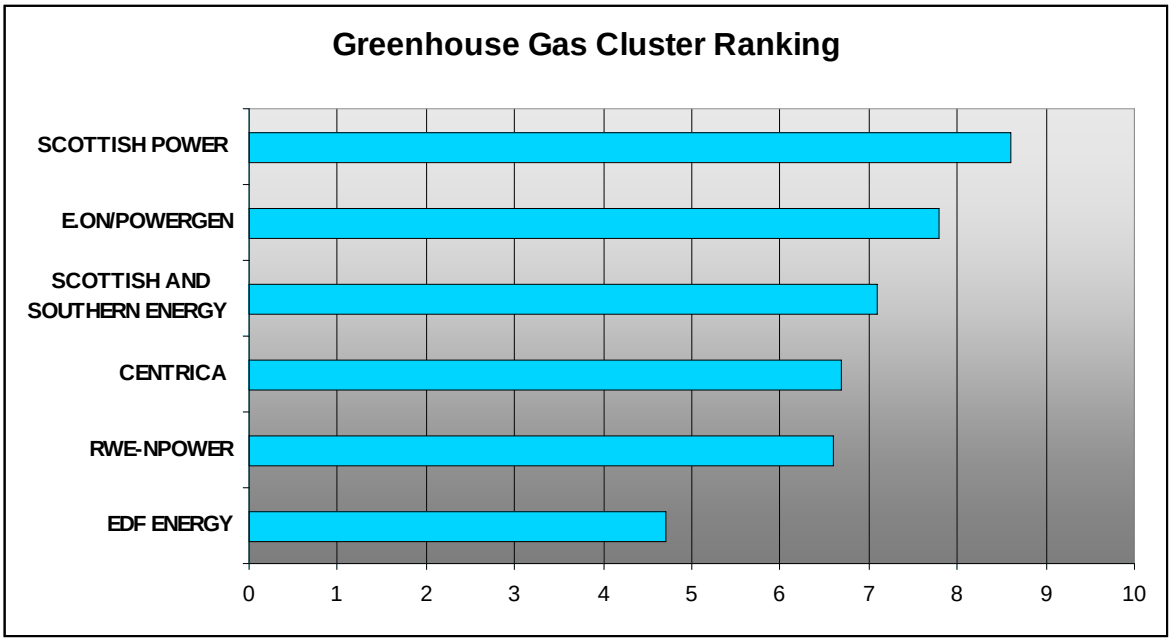

Figure 14. Greenhouse gas cluster ranking

Energy Efficiency cluster

Figure 15 below compares corporate performance on energy efficiency measures implemented by the six power companies and includes the EEC.

The EEC is a key policy instrument regulating energy consumption by UK consumers. Under its first phase, suppliers were required to set up schemes to promote and deliver energy efficiency measures to residential consumers, where 50% of such measures have had to be delivered to low-income fuel-poverty groups (the Priority Group).

We have attributed slightly lower significance to energy efficiency measures. While utilities were not restricted to their customer base in offering energy efficiency services and consumer education, their performance on this measure is still correlated with their market share. In addition, it is believed that EEC's effects on the level of carbon dioxide emissions is less pronounced than the effect of increased generation from renewable sources. Finally, all companies in our sample have performed well in their EEC-1 obligation by reporting over-compliance with the regulator's requirements.

EDF Energy and Scottish and Southern Energy are the sector leaders, with ScottishPower third. EDF Energy's ranking is due to the large percentage of its EEC over-compliance, while E.ON-UK also demonstrates good performance for the same reason.

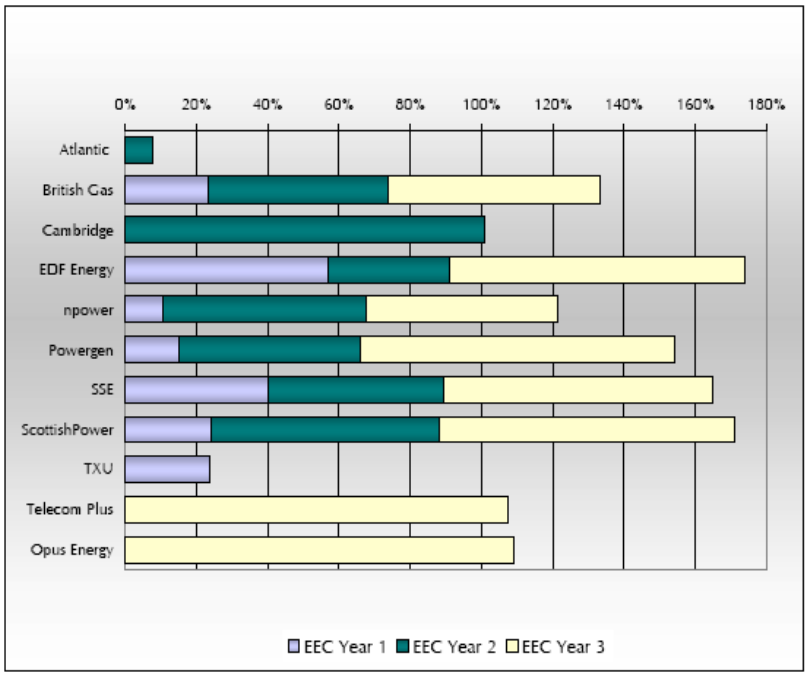

Figure 15. Energy Efficiency Commitment 2002-05

Source: Ofgem, August 2005

However, it is important to understand that we also measured carbon emissions reductions through the internal energy efficiency protocols pertaining to a company's own operations. Here, Centrica disclosed the most impressive results. It is also critical to mention that we measured efforts by companies to inform their residential/domestic customers how to implement a variety of energy efficiency measures.

In that regard, we requested information on subjects including the number of energy efficiency officers employed, the diversity of customer training services offered and the availability of energy efficiency grants for disenfranchised customers and associated grant-issuing conditions (see the Methodology section). This data was adjusted so that the size of the company's sales did not skew the results: the larger the volume of sales, the larger should be the customer training effort and the diversity of such programmes.

Numerous reservations could be raised against this relatively simplistic approach because EEC does not restrict the domain of energy service activities to the customer base. However, no data concerning EEC compliance and other energy efficiency measures can be treated at face value without scaling it by some common denominator – in our case, the volume of sales. We focused on sales because consistent data on the number of residential customers was unobtainable.

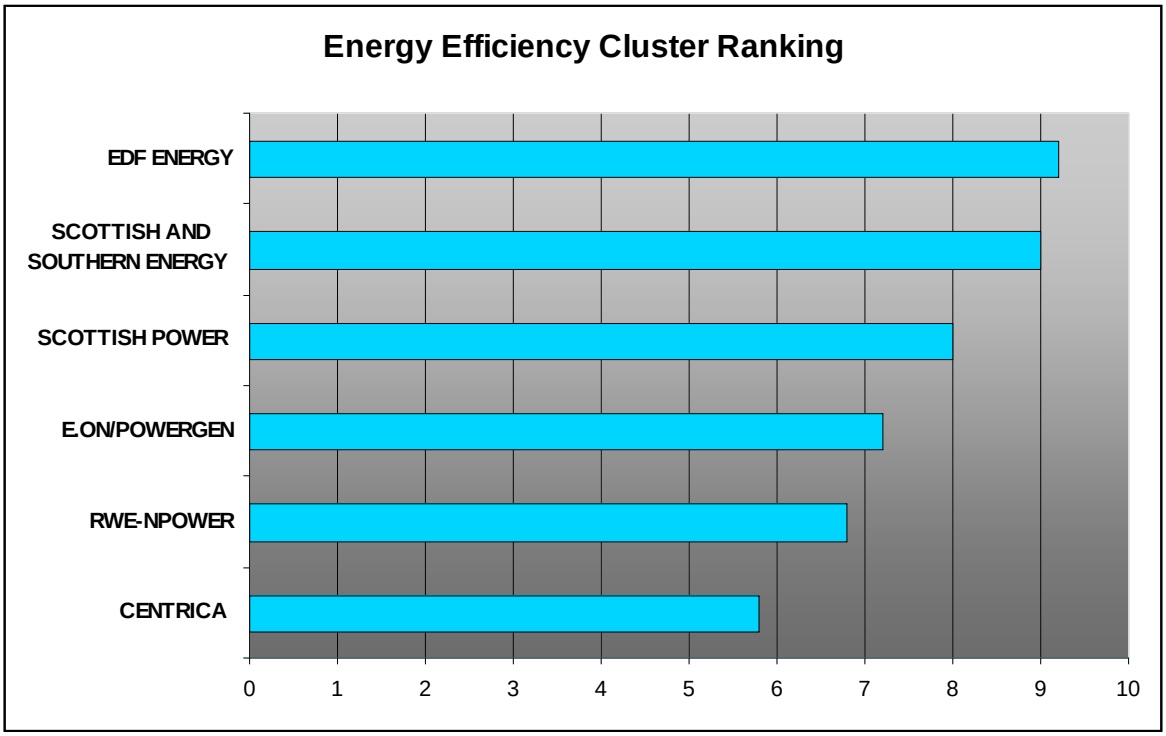

Figure 16. Energy efficiency cluster ranking

Renewable Energy cluster

The renewable energy cluster has been assigned relatively high significance because renewable generation can offset greenhouse gas emissions directly. A summary of results for this category is presented below.

Centrica is the leader, with ScottishPower and E.ON-UK close behind in this cluster. Centrica's ranking is due to its ability to meet the Renewables Obligation fully by surrendering ROCs instead of paying into the buy-out fund. E.ON-UK also covered 90% of its RO through the surrender of ROCs.

Relative to the size of its operations, Scottish and Southern Energy has the largest volume of installed renewable energy capacity. ScottishPower also scored well, given its planned investments in renewables.

In summary, there has been a growing convergence of power companies' performance with respect to expanding renewable generation capacity. Expressed differently, companies take different approaches to increasing renewable generation, but we observed a consistent growth in planned and consented assets as well as other measures aimed at increasing the total renewable

generating capacity in the UK. In addition, if any company lags behind its peers in installing and operating renewable assets, it generally balances the weaker performance on one variable by capitalising on another – signalling that UK generators can respond constructively to public and regulatory pressures.

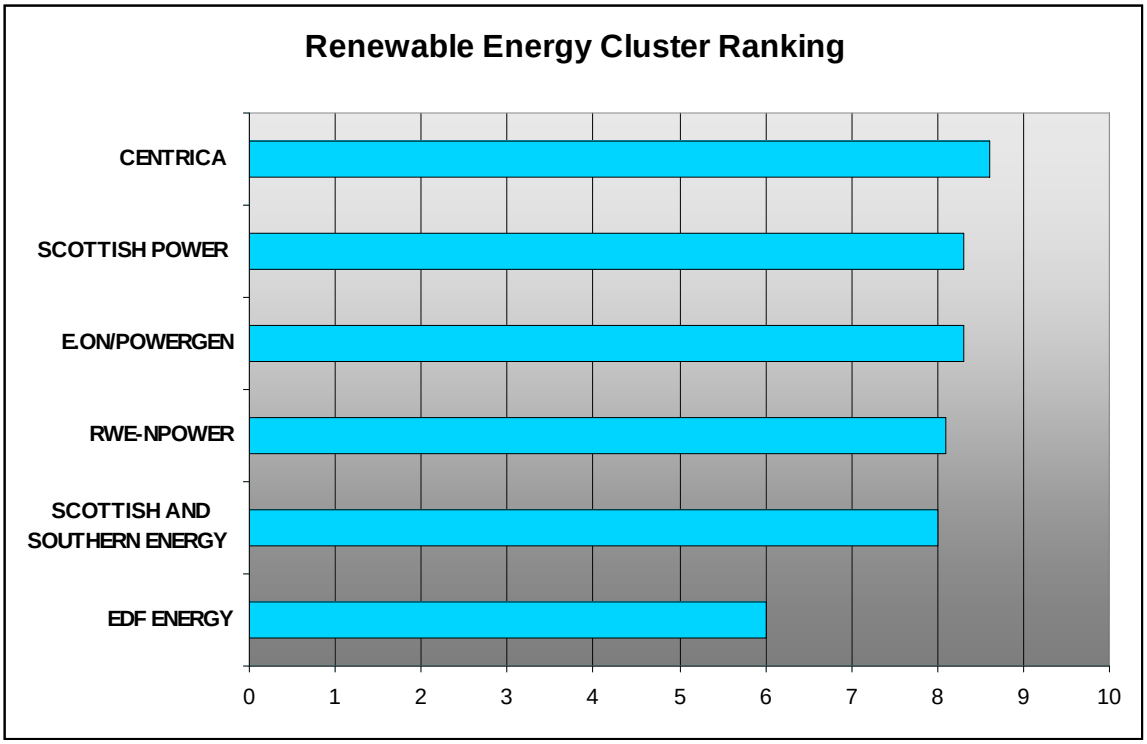

Figure 17. Renewable energy cluster ranking

CHP

RWE npower and E.ON-UK lead in this cluster due to relatively higher installed CHP capacity. Higher CHP capacity is a characteristic of the early CHP market entrants, which also tend to be larger-capitalisation companies. Current energy market conditions provide no incentive for developing additional CHP capacity in the UK. However, these conditions are rapidly becoming more conducive to technology joint ventures, mergers and acquisitions – an issue measured and captured in this cluster.

About WWF

WWF-UK is part of the WWF global network covering more than 90 countries. In 2005, WWF spent £182.2 million on conservation, policy, education and awareness programmes throughout the world. With 45 years of conservation work behind us, WWF is one of the most experienced environmental organisations in the world.

Through our programmes and campaigns, including our climate change campaign, we strive to be credible, challenging and effective, and to bring inspiration and optimism to the people whose lives we touch upon.

About Innovest

Innovest is an international investment research and advisory firm specialising in analysing companies' performance on environmental, social and strategic governance issues, with a particular focus on their impact on competitiveness, profitability and share price performance.

Innovest is dedicated to the production of high-quality, value-added research and advisory services in the field of sustainability and finance. Due to the to the potential financial implications of climate change and the cross-sector nature of this risk, it founded a specialised carbon finance practice in order to obtain a detailed understanding of the financial and other implications of climate change.

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Acknowledgements

WWF and Innovest thank the six UK power companies featured in this report for their participation. Their cooperation enabled a better-balanced and informative research programme to be carried out.

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· conserving the world's biological diversity
· ensuring that the use of renewable natural resources is sustainable
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