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What future for oil refining under Phase III of the EU Emissions Trading Scheme?

The continued ability of UK refining to meet the future needs of consumers and provide feedstocks for other industries, whilst meeting ever more stringent environmental standards, requires significant ongoing investment. In a globally competitive market, the delivery of this investment for UK refineries will have to be underpinned by a sound business case, along with a clear, stable and complementary policy background. Also, recently the Government outlined the importance of energy for the UK's national security within the National Security Strategy 2009.

UKPIA and its members believe that a healthy and robust domestic oil refining industry will continue to play a key role in the nation's future security of supply. The industry also shares the EU Commission's concerns about greenhouse gas emissions and has been working hard to reduce emissions from its own operations. However, the introduction of more stringent allocation of free ETS permits after 2012 presents several challenges.

Background

In April 2009, the European Union adopted a revised Emissions Trading System (ETS) with the aim of placing a tighter cap on overall emissions of greenhouse gases for energy-intensive sectors. The revised EU ETS is part of a climate change-energy legislative package, which aims at reaching the overall objective of at least 20% reduction in greenhouse gases by 2020 - compared to 1990 levels - and of achieving a 20% share of renewable energies in overall EU energy consumption by 2020, including a target of 10% renewable transport fuels.



Under the current rules of EU ETS, EU Member States are required to set an emission cap for all installations covered by the scheme (ranging from large combustion plants, to refineries and other energy intensive processes), and to issue a National Allocation Plan showing the allocation of allowances to each installation for the period 2008 -2012. Most allowances have been issued free, based on projected need, with a small amount of auctioning.

From 2013, the EU ETS will enter a third trading period - Phase III - with very different rules. The total EU cap will decline by 1.74% annually, to give a reduction by 2020 of 21% from the 2005 level of EU CO₂ emissions. Furthermore, most emissions permits will be auctioned. Electricity generation will face full auctioning from 2013, and other ETS sectors will have to start by purchasing 20% of their emissions permits at auction. This rate will gradually rise to reach 70% in 2020, with a view of reaching 100% in 2027.

For industries that are exposed to international competition and risk of loss of investment or 'carbon leakage', however, the EU Parliament has introduced the possibility of allocating

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free allowances on the basis of strict benchmarking against the best performance in EU.

Free allocations will apply to industries that demonstrate that purchasing permits would significantly increase their costs by more than 5% of their gross value added, and are exposed to international competition because non-EU trade intensity is above 10%. Nonetheless, full free allocations will not exceed the level of an ambitious benchmark corresponding to the average of the 10% cleanest installations in the EU in each sector in 2007-08.

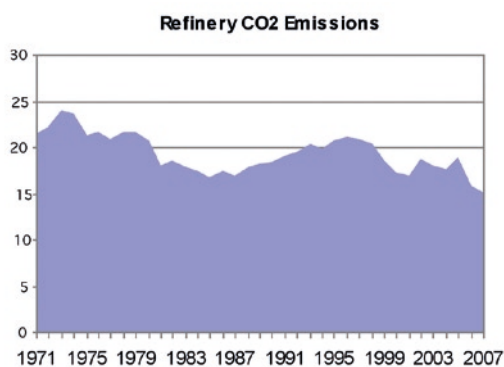
Any installation emitting more than its allocation will need to acquire allowances from the market up to the level of its actual emissions.

The list of industries exposed to international competition will be agreed by the end of 2009, and the benchmarks for free allocation by end 2010.

Oil Refining

Oil refining has been included in the EU ETS since the start of the scheme in 2005. The refining industry shares the EU Commission's concerns about greenhouse gas emissions and has been working on a number of measures to reduce emissions from its operations: indeed, **in 2008 verified emissions from the UK refinery sector were 6% below the 2005 level, despite the need to produce higher quality 'sulphur-free' products which require more processing and energy to remove the sulphur** - as shown in the figure below.

However, the industry and the associated trade in oil products are facing several challenges. In 2008, the European oil industry commissioned NERA Economic Consulting to examine in detail the exposure of oil refining to international competition. The report highlighted that trade openness in the refining sector rivals that of most other sectors affected by the EU ETS, and is mostly with countries that do not have constraining absolute targets (e.g. USA, Russia, Middle East). Therefore, EU refineries face significant asymmetric CO₂ emission costs which would reduce margins and would reduce the attractiveness of the EU as an investment location, and act as incentive for investment outside the EU. This would not necessarily contribute to a global reduction in emissions, but merely a displacement to other regions with lower environmental standards. This, in turn, would result in the increase of EU imports of diesel and jet fuel, reduced EU exports of petrol, and in reduced energy supply security.



Source: DECC

Phase III of ETS - Benchmarking for refineries

During the third ETS trading period from 2013, the ambitious benchmark for all free allocations is to be based on the average of the 10% cleanest installations in the EU. However, implementing this presents several

challenges because refineries come in a wide variety of size and complexity, and produce different yields of multiple products (i.e. petrol, diesel jet fuel, and heavy fuel oil). More complex refineries do more processing and produce a higher yield of cleaner products, such as petrol and diesel, but use more energy to do this.

Therefore, it is not easy to measure which refineries are most carbon-efficient in order to set a benchmark based on the average of the most efficient 10% for the allocation of free allowances.

In order to solve this, the EU oil refining industry recommends the 'CO₂ weighted tonne' approach, derived from long industry experience with benchmarking by Solomon Associates. This approach is widely accepted by the whole sector and capable of providing a single benchmark for both existing and new refineries. In addition, it is not specific to fuel, feedstock, or technology, and differentiates on CO₂ efficiency. The EU Commission's consultants Ecofys also support this approach.

For more details visit www.ukpia.com - Industry Issues/Climate and Carbon Dioxide Reduction.

... and the proposed Industrial Emissions Directive

In June 2009 the EU Council reached a Political Agreement (PA) with a view to the subsequent adoption of a common position on the recast of the Integrated Pollution Prevention and Control Directive (IPPC), to be known as the Industrial Emissions Directive (IED).

The IED aims to prevent and control pollution of the air, water and soil from industrial installations' emissions by greatly strengthening the role of Best Available Techniques (BAT) as defined in BAT Reference Notes. The Directive regulates a wide range of emissions, including sulphur and nitrogen compounds. Emissions of carbon dioxide are not covered by the IED.

UKPIA believes the PA has found the right balance between the need to strengthen the consistent application of BAT throughout the EU, and the flexibility for competent authorities to take account of site-specific costs and benefits, especially for retrofitting abatement into existing installations. The proposal also fits well alongside the separate policies on control of greenhouse gas emissions such as the EU Emissions Trading Scheme.

The IED will replace the Large Combustion Plant Directive, and the proposal contains important provisions for those large combustion plants, such as refineries, which burn the off-gases and residues from processing crude oil. These LCPs are excluded from the new and tighter emission limits proposed pending a review by 2013, and this reflects the exclusion of such plants from the scope of the current technical BAT Reference Note.

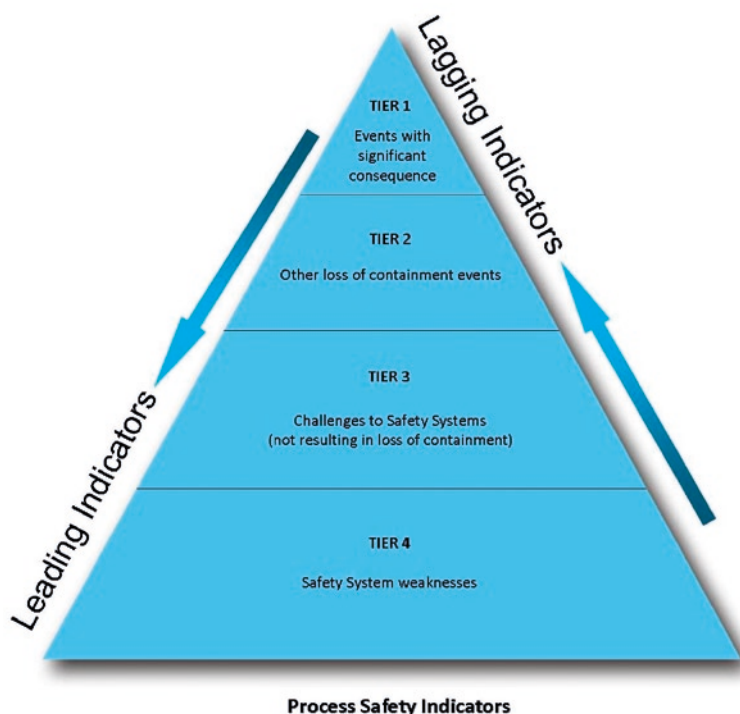
UKPIA believes the PA text to be a good legislative proposal which deserves to be supported without further change. We support improved implementation and enforcement of this proposal as being the most cost-effective way of achieving further environmental benefits.

Process Safety Performance Indicators

The UK Petroleum Industry Association and its members are strongly committed to the health and safety of their workforce and the public. After the incidents at Texas City in the USA and Buncefield in the UK, the industry was challenged to improve its management of the integrity of hazardous operations by developing indicators of process safety performance. To this end, UKPIA has been working with the American Petroleum Institute to develop a comprehensive system of leading and lagging indicators to help drive improved performance of process safety in the refining, oil storage, and petrochemical industries.

The aim is to develop a consistent and appropriate set of indicators which can be used throughout multi-national companies for reporting both internally to management and externally to regulators and to the public. By using similar definitions and thresholds, it will be possible to compare performance across organisations and industry sectors.

The recommended approach is an extension of the "safety triangle" theory which has become widely accepted in the management of personal safety, where for every accident with major consequences there are many precursory events occurring with minor consequences. Overall safety performance is improved by identifying the underlying causes of the "near misses" and taking action to prevent recurrence. It is believed that a similar predictive relationship exists in the control of hazardous operations to prevent loss of primary containment (LOPC) - as shown in the figure below. Companies should measure events involving loss of primary containment with greater or lesser consequence (Tiers 1 and 2), and also adopt appropriate indicators to measure challenges and weaknesses to their safety systems (Tiers 3 and 4).



The recommendations are currently being finalised as a formal US standard to be known as API RP 754, and will provide guidance and a framework for measuring process safety performance for the refining and petrochemical industries. The approach may also be applicable to other industries with high hazards.

Fuel duty changes

The main changes relate to fuel duty increases in September 2009 of 2p per litre, and a further duty increase of 1p per litre above indexation in April 2010.

A VAT increase is due on 1 January 2010, as well as a withdrawal of the current 20p per litre duty reduction on biofuel content in April 2010.

The withdrawal of the 20p per litre duty incentive on the biofuel content of petrol and diesel is linked to a change in the Renewable Transport Fuel Obligation under which a 30p per litre 'buy-out' penalty will be placed upon fuel suppliers not meeting the biofuel content requirements of the RTFO.

As regards the VAT increase due on 1 January, the industry, along with other sectors, is making representations to Government over the timing of the major systems' changes required to implement the increase during the holiday period.



Fuels round-up

In April 2009, the European Union adopted a Directive aimed at establishing a common framework for the promotion of energy from renewable sources. The EU Renewable Energy Directive (RED) sets mandatory national targets for the overall share of energy from renewable sources in gross final consumption of energy and for the share of energy from renewable sources in transport.

The RED aims at achieving a target of 10% share of energy from renewable sources in each Member State's transport energy consumption, and an overall EU 20% renewables target by 2020.

In addition, the revised Fuels Quality Directive (FQD) introduces a reduction target for greenhouse gas (GHG) emissions from transport fuels. This requires Member States to reduce GHG emissions by 6% vs 2010 levels, on a life cycle basis, by 2020. This target could be met in a number of ways, such as by reducing the carbon intensity of fuel produced by refining, biofuels, electricity etc. In practice, we expect most of the reduction to be met through the use of biofuels, along with a contribution from electricity.

The Directives also establish the EU-wide sustainability criteria for biofuels. Initially, the greenhouse gas emission savings from biofuels shall be of 35%. This target shall be deferred to 2013 only in case of biofuels produced by installations in operation on or before 23 January 2008. With effect from 2017, the greenhouse gas emission savings from the use of biofuels shall be of 50% for existing production, and 60% for biofuels produced in installations whose production has started from 2017.

Summary of Legislation

UK RTFO

- Commenced 15th April 2008
- 'Gallagher' review reported June 2008
- Targets revised to 3.5% volume by 2010/11 & 5.0% by 2013/14

EU Biofuels Directive 2003

- Indicative target of 5.75% by energy (~7.5% by volume) by 2010

Energy Act 2004

- Renewable Transport Fuels Obligation (RTFO)
- Targets of 2.5% volume 2008/09 increasing to 5.0% volume by 2010/11

EU Renewable Energy Directive (RED) 2009

- To be implemented January 2011
- Target of 10% by energy (~13% volume) by 2020, with review 2014

EU Fuel Quality Directive (FQD) 2009

- Target of 6% GHG reduction vs 2010 levels by 2020

Business Rates' Revaluation



The Valuation Office Agency (VOA) has carried out a revaluation of the rateable values of all businesses. Every five years, all non-domestic and business properties are assessed and given new rateable values, based on rental values, in order to calculate liability for business rates. In Scotland the Scottish Assessors, whose representative body is the Scottish Assessors Association (SAA), undertake a similar assessment to the same timescale.

The next revaluation for business rates takes effect from 1 April 2010. For this, rateable values will be based on market rental values as of 1 April 2008.

A key factor in arriving at rateable value for filling stations is the maintainable throughput of the site and assumed fuel margin, along with associated shop and car wash's income. The VOA's initial proposals have contained unsustainably large uplifts of up to 100%. During these exceptionally difficult times, a revaluation based on market conditions as on 1 April 2008 could represent a challenge particularly for lower throughput filling stations, as the market rental values may now be lower than in 2008.

UKPIA has raised these concerns with Government and the VOA. UKPIA will be pushing for some flexibility on how the revaluation is applied, perhaps by applying an April 2009 base date or a more generous and longer transition in applying the full 2010 revaluation.

The VOA on its website states that the new multiplier will be set to ensure the overall national rates bill will remain the same. New rates bill will depend on how the rateable value has changed relative to all other rateable values since the last revaluation, not on any changes in the rental market between 2008 and 2010

Fuel supply to rural filling stations



Over the last sixteen years the number of filling stations in the UK has reduced dramatically from over 18,000 in 1992 to 9,264 at the end of 2008, with recently around 450 filling stations closing each year.

With pre-tax pump prices consistently amongst the cheapest in Europe, fuel retailing in the UK is a high volume, low margin business characterised by strong competition. These market conditions have hastened the closure of smaller, less well located sites, as retailers concentrate on higher volume sites capable of surviving in a lower margin environment. This has favoured large service stations with lower overheads per litre sold in areas with higher population density. Indeed, in recent years, whilst the number of filling stations owned and operated by both oil companies and independent retailers has declined, the number of supermarkets' sites has increased. Their share of the retail's fuel market has grown from 11% in 1992 to around 40% in 2008, in an overall

market which has seen little volume growth.

The supermarkets' growth in market share has coincided with a rapid expansion in the number of large out-of-town stores, where the associated filling stations are able to sell large volumes of fuels - particularly to people doing their weekly shopping - often cross promoting a fuel discount to the amount spent in the main store.

On the other hand, smaller/rural filling stations are facing a great number of challenges. Filling stations located in the extreme rural fringe will inevitably sell a lower volume of fuel and will require more frequent deliveries in less than full loads. They might also incur a cost penalty due to the distance from the refinery or main terminal. Along with other overheads (i.e. fixed costs for staff, rent, rates, heat, light, water, maintenance and repair), the increasing cost of compliance with environmental legislation - UK and EU - is also a challenge: changes or updates associated with infrastructure - tanks, lines, pumps etc. - are often not viable for the smaller retailer. Whilst capital expenditure is easier to justify for larger retailers and supermarkets, as they sell enough volume of fuel, many smaller retailers struggle to justify this, based on projected turnover and profitability levels.

Also, the volatility of the retail price has a greater impact on retailers that sell lower volumes of fuel. For instance, in a declining market smaller retailers are often left with product bought some time ago at a high price. Whilst higher volume retailers might be able to

sell at a lower price, the smaller retailer faces a loss or the possibility of keeping a higher market price with low sale volumes. On the other hand, when prices are higher, the small retailer may struggle to finance a load of fuel. These factors are also reflected on the final pump price, which inevitably varies between areas of dense population and rural locations due to increased associated costs vs lower volumes of fuel sold. Clearly, the economics of petrol sales alone are insufficient to ensure a sustainable future for rural sites.

Filling stations' closures have wider social (provisions to the community), economic (i.e. tourism) and environmental impacts (i.e. added drive-time to re-fuel).

A number of studies have looked at the impact of rural filling stations' closures and at measures that could be implemented to slow the rate of decline of smaller sites. Amongst a number of options that have been examined are fuel Duty and Vat differentials, above ground tanks/mobile petrol stations and unmanned stations.

Petrol retailing facilities in remote/rural areas are a key provision to local communities and must be considered in the wider context of other important consumer services to that sector such as banking services, groceries, public transport, post office services and so on.

For more details visit www.ukpia.com - Publications/Fuel Supply to Rural Filling Stations

Amended Diesel Specification

The British and European standard for automotive diesel BS EN 590 has recently been amended and now permits up to 7% by volume of the biodiesel FAME (fatty acid methyl ester). The previous limit in BS EN 590 was 5% by volume of FAME in diesel.

The Department for Transport is arranging for pump labelling regulations to be modified to reflect the new standard. The move to B7 is part of a wider push at the EU and UK level to reduce the carbon emissions from road transport.

Interview - Jon Barden

A refinery Manager's perspective

Nunzia Florio interviews Jon Barden, Refinery Manager of Petroplus Coryton Refinery. Jon joined Petroplus in October 2007 as the Coryton Refinery Manager. Since graduating in Chemical Engineering from Imperial College, Jon has gained over 20 years experience in the oil refining industry. The majority of this time was with BP in various roles including international assignments in the US, Netherlands and Australia. Jon is married with three daughters and his interests are Football, Travel, Literature and Family Holidays.

What are the main focus areas of your work at the Refinery?

I concentrate my activities on the areas that are important for the key stakeholders in the business - the customers/employees/external community/shareholders. Their expectations are that our business is safe, reliable and efficient; so my time is focused on these areas. The Coryton workforce is very capable and talented. My role is to create an environment where all of that capability can be used to make improvements in the key areas. The biggest benefit of the role is that you get an insight on all of the developments that are occurring across the whole site.

The UK has now moved to sulphur-free road fuels. What impacts has this had?

The overall impact of the very low sulphur road fuels has been additional costs for the operating companies. There are several contributory factors to this outcome including the reduction in the crude purchasing flexibilities, increased operating costs, especially energy and catalysts. Despite the significant capital investments made by the industry over the past few years, nearly all operators have suffered reduced capacities on key operating units as a result of the requirement to produce 10 ppm sulphur fuels.

Last year also saw the introduction of biofuels. Do they require additional testing?

Although the handling requirements for imported biofuel components present some additional challenges, they are tested and certified to UK transport fuel specifications.

Recent years have also seen a rise in demand for diesel cars. What are the impacts of this shift in demand for refining in the UK?

Unfortunately the UK is diesel short and as a consequence has to import finished diesel from other countries. UK refineries were originally designed to maximise gasoline

production and with the move to increased diesel demand we are now producing more gasoline than the country consumes. This surplus is exported.

Do you use a wide range of crudes at the refinery? What influence has the type of crude upon the mix of products a refinery produces or on the processing?

We do use a wide range of crudes and their selection is based on Refinery configuration and availability and price of crude in the market place at the time. We do have somewhat limited ability to process high sulphur crudes because of the shift to produce low sulphur fuels.

What other industry sectors rely on refining as a source of feedstock?

The Chemicals and Construction Sectors are supplied with refined products. Chemicals with propylene and Construction with bitumen for roads.

Forecasts show that in the future we will have a higher demand of jet fuel. How can we meet this demand?

The UK refining industry produces less Jet Fuel than the market requires and so there are large imports to supplement the refinery productions. The technology does exist to increase jet production from heavy oil (hydrocracking) but this is extremely expensive. However, this investment would become more attractive if the Jet and Diesel margins were strong over a sustained period.

UK refining is also continuing to reduce CO₂. How is this being done?

Refineries use a huge amount of energy to process the oil to products. Energy efficiency is driven by the high cost of fuel and the cost of CO₂ credits. There are two main processes to lower energy consumption and CO₂ emissions. The first is to ensure that the existing plant is operated as efficiently as possible by focusing on a number of good operating practices, ensuring the equipment (heat exchangers) used to transfer heat from one stream to another, are routinely cleaned and that our furnaces have low excess oxygen and no air ingress.

The second pathway is by continuous investment in added new heat efficiency equipment and improved heat exchange configuration. At Coryton we are actively working in both areas.

Following the Buncefield explosion the industry has done a huge amount of work to improve the way we do things. Could you tell us what this has meant for a refinery?

The storage and processing of hydrocarbons is an inherently hazardous business. Events such as Buncefield are an unwanted reminder of what can happen if we do not get things 100% right 100% of the time. Our response to Buncefield has been to review our behaviours, our processes and our equipment. We need to ensure we are always following our procedures and completing all of our routine checks and inspections. We have also reviewed our storage facilities to identify the cost effective upgrades we can make that will reduce the risks associated with the storage of hydrocarbons.

Engagement of the workforce in the promotion and achievement of good process safety management is one of the principles launched by the PLSG. How do we do this?

Engagement of the workforce is the key enabler for safety, reliability and efficiency. My personal view is that the industry has more to learn in this area. We need to listen more and ask more questions. We also need to hold firm boundaries on operating standards and rules whilst not appearing draconian. At Coryton, we already have a number of good processes that facilitate discussions on safety and communicate to employees about safety topics. The area that we are putting more focus on is education. We are improving our training on identifying risks and managing risks in all aspects of our business. We are committed to this activity and a lot of our training on these topics is now delivered by our senior managers. Our belief is that this shared experience of learning and growing together will, over time, improve our engagement on the appropriate management of safety across the entire site.

What challenges and opportunities do you see at the refinery?

The daily challenge and opportunity for Coryton is to be safe, reliable and efficient. All three are important, and we cannot be a successful business without being good in all areas. Despite the changes that will inevitably occur, there will still be a strong role for transport fuels in the UK economy. Our role is to manage the refinery to meet these challenges and expectations and still deliver an economic performance that justifies the confidence and support of our owners, the shareholders.

EVENTS

Fringe Events

The UK Petroleum Industry Association attended all Party Conferences in September and October 2009.

The petroleum industry highlighted the global challenge in meeting greatly increased future demand for energy. The International Energy Agency estimates an increase of 45% in energy demand vs 2007 levels by 2030. UK refining will continue to play a pivotal role in the UK's security of supply, as a continued reliable source of transport fuels and feedstocks for other industries. The ability to meet this future demand requires significant ongoing investment underpinned by a sound business case, along with a clear and complementary policy background.

The industry also shares concerns about the greenhouse gas emissions and has been working hard in a number of ways to reduce emission. UKPIA members companies globally are also engaged in research of a wide range of alternative fuels.

For more details visit www.ukpia.com

Refinery Visit

On 1 October, Charles Hendry MP, Shadow Minister for Energy, joined Chris Hunt, UKPIA's Director General, Barry Fitzpatrick and Nigel Tranter of Total on a tour of the Lindsey Oil Refinery. The tour highlighted the scale and complexity of the refining process and outlined some of the current issues facing LOR and the refining industry in general in meeting future consumers' and UK energy needs.

The Shadow Minister's visit formed part of a wider visit to key energy installations in the area and UKPIA thanks him for joining us on this informative tour and Total for hosting.

Forecourt Passport Scheme

Health & safety and sound work practices are our top priorities. Works undertaken on a filling station present a number of potential hazards not normally encountered on other sites. For this reason, UKPIA and its members have helped develop a self-regulatory scheme to ensure that workers in the industry, and particularly contractors working on forecourts, are trained to meet specified standards. It is a requirement to complete a two day training course before undertaking any work at a petrol filling station. Successful candidates receive a 'Safety Passport' which qualifies them to work on a filling station. The Passport has to be renewed after 3 years to ensure all contractors are up to date with working practices, technology, legislation and products.

Renew your Safety Passport

For more details visit www.ukpia.com

- Industry Information/Training Information



Brian Worrall, Sales Manager in Europe for Chevron's marketing business, has been appointed President of the UK Petroleum Industry Association. Brian has been UKPIA's Vice President for the past year and succeeds the outgoing President **Janet Ashdown** of BP. UKPIA thanks Janet for her work as President over the last year.



Brian Worrall

Didier Harel of Total has been appointed Vice President, **Gary Heywood** of Ineos has been appointed succeeding vice-President and **Daniel Tyzack** is the new Council representative for BP.

UKPIA also welcomes **Stefan Wulkan** as Council representative from ConocoPhillips, replacing **Rupert Turner**. Rupert has been a Council member for over 3 years. We thank him for his valuable contribution to UKPIA over the years.

Hugh Tucker was appointed as UKPIA's Technical Director in August. He has taken over from **Malcolm Watson**, who will continue working part time in the capacity of Technical Adviser until his retirement at the end of 2009.

Emma Heywood will be representing ExxonMobil at UKPIA's Press Committee. Emma replaces **David Eglinton**, who will be joining ExxonMobil's media team in Houston, Texas. David has been a member of the Press Committee for over 8 years and we thank him for all his support and valued input to the Committee. We also extend our thanks to **Daniel Schraibman** Press representative for Chevron who will be replaced by **Isabelle Guerin**.

Alan Davies of BP, who has chaired the Rail Committee, has stepped down in the summer. He is replaced by **Daniel Brain** of Murco. We wish Alan all the best in his retirement.

We also welcome **Sanja Spasojevic** who joined UKPIA in August as Business Analyst, replacing **Abigail Hayhoe**.