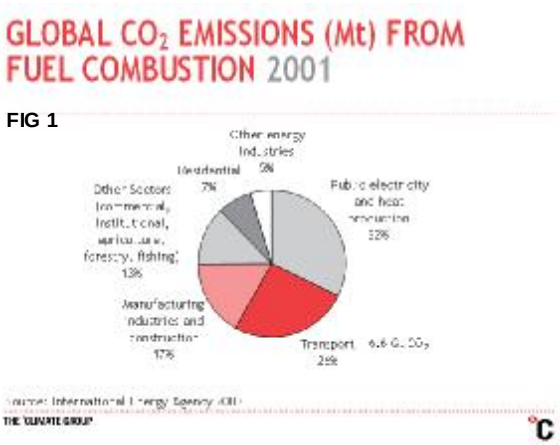
LOW CARBON LEADERS: TRANSPORT BRIEFING SEPT 2005

FOREWORD

Over the last 100 years, the private automobile has enabled unprecedented social change and development through the freedom of mobility it allows. Yet the pollution, resource depletion, congestion and increase in greenhouse gas emissions that have ensued as a result of this freedom are becoming a costly price to pay.

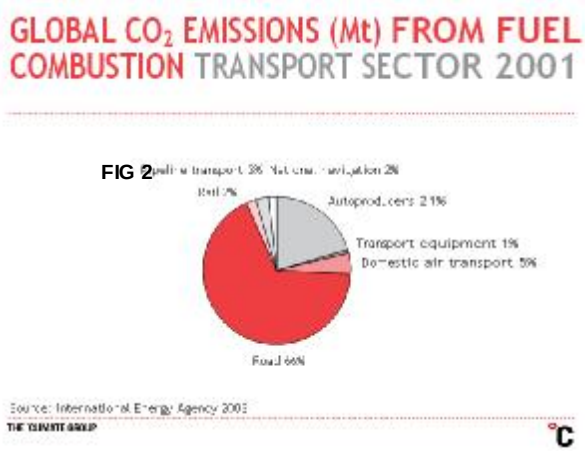
FIG 1



For the past 30 years, the transport sector's share of CO_2 emissions (emissions resulting from the movement of people and goods) has increased at a faster pace than other sectors. From 1971 to 1997, transport-related CO_2 emissions from industrialised countries nearly doubled and globally the transport sector now contributes a quarter of all anthropogenic CO_2 emissions released into the atmosphere (Fig. 1). Approximately 80% of those emissions are from road transport usage and vehicle production, of which 60% is from automobiles and sports utility vehicles used to meet commuter and other household transport needs (Fig. 2)[1]. The transport sector is the third largest source of CO_2 emissions in the UK and the only sector in which emissions are expected to be higher in 2020 than in 1990.[2]

Rapid development of transport infrastructures throughout the industrialising world has the potential to drastically increase global greenhouse gas (GHG) emissions from transport. By 2030, there are projected to be more vehicles in the developing world than in developed nations.[3] Without decoupling transport emissions from economic growth the climatic consequences could be dire. Yet the challenge ultimately lies in deciding which course of action to take.

FIG 2



The Climate Group works to show that organisations can reap positive benefits from committing to reducing their greenhouse gas emissions and sharing best practice on the policy, financial and technological measures required to make these reductions. Climate Group research has demonstrated that in the majority of cases these actions have made economic sense and in many cases proved profitable.

The Climate Group is working with a range of public and private institutions that are successfully taking on the challenge of reducing emissions from transport. There are three distinct areas of action; technological advancement - changing fuels and fuel efficiency; promoting non-motorised transport; and transport management. All come with inherent benefits and challenges and may be used effectively in different situations.

This is The Climate Group's first publication in the field of climate change and transport. All the organisations we work with appreciate that transport emissions need to be addressed in a comprehensive and integrated

[1] http://climate.wri.org/topic_keyissues_text.cfm?cid=1277
[2] http://www.tyndall.ac.uk/research/theme2/final_reports/it1_7.pdf
[3] http://eprints.ucl.ac.uk/archive/00000108/01/Lloyd_Wright,_Bonn,_Germany,_Transport_and_climate_change.pdf.

fashion: The Climate Group plans for this to become a major component of its work over the coming months and years, focusing on leadership and innovative solutions. Here, we highlight three key examples, each approaching transport emissions from a different angle and each achieving impressive results. Toyota, a leading auto-manufacturer has pioneered the use of hybrid technology in its vehicles and has successfully moved the electric/'gas' engine from niche to mainstream markets. Pfizer, a global pharmaceuticals company, implemented an innovative transport plan at its European Research and Development Facility in Kent, which has lead to a large scale switch from private car use by employees to alternative modes of transportation. And the Greater London Authority has implemented its congestion charging scheme, now the largest such transport management strategy in the world. The revenue generated from road pricing is being invested in low-emission public transport initiatives, such as the zero emission fuel cell buses currently being piloted in the capital.

Promoting fuel efficiency and use of less carbon-intensive fuels is a popular measure with manufacturers; acting early and investing in technological R&D are likely to allow for significant market advantage in the coming years, especially as demand for fossil fuel alternatives heightens. Volkswagen has committed to developing optimised fuels, such as biofuels (SunFuels) and synthetic fuels (SynFuels) that can be used in the internal combustion engine as an interim measure whilst giving zero emissions technologies such as hydrogen fuel cells (being pioneered by companies including UTC, Ballard Systems and Johnson Matthey) time to come to market. By improving vehicle technologies and fuel quality, and supporting the production and distribution of alternative fuels, companies such as Volkswagen allow proactive organisations like Whitbread (see Box 1 – Whitbread) to implement best available solutions to reduce their climate impact.

Box 1: WHITBREAD
Whitbread is taking decisive action to reduce its fleet emissions through implementing best available technologies and efficiency measures. The company introduced new trucks in March 2004 that use diesel when first started up, then default to a diesel/natural gas mix. 85% of total fuel use is natural gas and each vehicle will produce 64 tonnes less CO_2 per annum than its diesel counterparts. Additionally, the company has introduced a measure called backhauling; vehicles do not return to the depot empty after delivery, but rather collect from suppliers en route. This has many advantages for the supply chain – including saving on suppliers' haulage costs, and reducing the number of vehicles on the road and consequent CO_2 emissions. Whitbread has seen a 400% growth in backhauling the last six years, with the fleet making over 4,500 collections a year on return journeys. The company has also reduced its car fleet which now contains 12 Honda Civic hybrid vehicles. Such simple changes in behaviour can yield positive environmental results at no cost and may even prove to be profitable.[4]

Promoting non-motorised transportation is also an attractive solution for reducing emissions from private transport use, since measures can be implemented immediately and the majority of these measures are zero-emission – walking and cycling for example. One-quarter of all car journeys are less than two miles[5], a distance which could easily be covered by foot or cycle, alternatives that also have inherent health benefits. A number of cities have encouraged the use of alternative modes of transport through infrastructure/transport planning or implemented schemes designed to incentivise residents to leave their car at home.

Freiburg in Southern Germany, for example, has pursued an environmentally friendly urban development policy for 30 years in which transport plays an important role. A cycling plan was drawn up in 1970 and the city now has over 500 km of bicycle paths. As a result a third of all journeys are now made by bicycle. There are more than 5,000 bicycle parking spaces in the city, with more at tram stops for "bike and ride" commuters. The main railway station has parking and other cyclist facilities for 1,000 bicycles and the old town centre became car-free in 1973. There has been a 100% increase in people using public transport since 1980, aided by the introduction of a low-cost flat-rate monthly "Environment Ticket" for the region-wide bus service in 1991. In the new district of Vauban, if residents sign a contract stating that they will live without a car, the requirement to buy a parking space in the district garage is waived, reducing the cost of their housing. Around 30 - 35% of the residents have chosen to live without a car.[6]

[4] http://www.whitbread.co.uk/view_document.cfm?id=43
[5] http://www.bikeroute.com/EnviroFacts.htm
[6] http://www.solarregion.freiburg.de/solarregion/freiburg_solar_city.php

With over 18,000 traffic movements each day, Addenbrooke's Hospital is reportedly the largest single generator of traffic in Cambridgeshire. In order to cope with this huge volume of traffic, the 'Access to Addenbrooke's' strategy was introduced to help reduce car parking demand and traffic congestion. At peak times more than 60 buses stop at Addenbrooke's every hour and bicycle parking has increased to 1,300 spaces. This is complemented by a weekly visiting cycle repair service. To encourage staff to use lower emission methods of transport, the Trust offers interest-free loans for pedal cycle or motorcycle/scooter purchase, have 16 pool cars, a car-share scheme and offer discounted weekly bus tickets. Latest reports on the travel plan show impressive shifts from car commuting; bus use is now at 23% (from 12% in 1999) and cycling is up to 25% (from 21% in 1999). In conjunction with the travel plan, the Space Programme advertising campaign was launched to inform people travelling to the site about all the transport options available to them and to encourage them to leave their cars at home.[7]

Box 2: BRITISH TELECOM

Back in 1991, when BT's teleworking initiative had just got underway, one early evaluation carried out by its research and development labs suggested several benefits, including a significant reduction in company overheads. Furthermore, the evaluation pointed to the reduced environmental impact a flexible working policy could bring, from employees' avoiding rush hour commuter traffic to fewer journeys made by BT's own fleet of vans and cars. This is backed-up by subsequent data which suggests that, since 1998, there has been a 15% reduction in BT car and van fleet miles travelled, contributing to a 32% reduction in CO_2 emissions since 1992.

BT's new report *Broadband – the role for communications in beating congestion* analyses the average 19% growth in UK and regional traffic in the past decade and is a call to action for those involved with traffic management, employers, commuters and shoppers. With broadband communications available to 99.6% of the population by summer 2005 it is clear that there is significant potential to make a real impact on congestion. The report brings together contributions from business, motoring, academia and BT to suggest a way forward. International comparisons show that the task is achievable and realistic. It shows how business can become more profitable and productive while individuals can lead more fulfilling lives. Full report available at: http://www.btplc.com/Thegroup/Regulatoryinformation/Consultativeresponses/BTdiscussionpapers/Congestion/Congestionreport.htm

The option to leave cars at home is an option also being strongly advocated by British Telecom (BT) (See Box 2), a company offering groundbreaking ICT solutions to eliminate unneccessary travel. For unavoidable journeys however, there are other options for dealing with resulting emissions. Offsetting greenhouse gas emissions from transport by investing in abatement schemes such as renewable energy/energy efficiency projects or low carbon transport systems elsewhere is one such option.

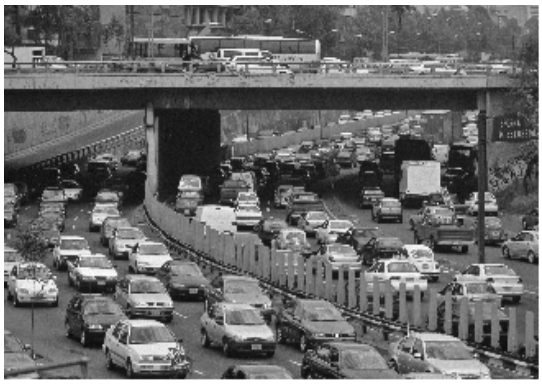
BP has been a pioneer in offsetting the climate impact of its fuels. In 2001, BP Australia, with Det Norske Veritas, the Commonwealth Bank of Australia and the Australian Greenhouse Office, initiated the *Greenhouse Friendly* programme, offsetting all emissions associated with BP Ultimate. BP scaled back the offer in 2002, due to a lack of customer understanding and instead began to offer the product exclusively to commercial users of its fuel credit cards. This retrenchment saved the programme and BP now boasts more than 6,500 commercial card customers who have collectively offset more than 819,000 tonnes of GHG emissions. In addition, sixteen corporate customers, including Queensland Rail, have partnered directly with BP to purchase more than 300,000 tonnes of GHG reductions. The company also offsets 100% of its own staff's transport emissions.[8]

In addition, throughout the summer of 2005 BP partnered with the Eden Project to offset the vehicle emissions of visitors to the centre in Cornwall. Visitors have been offered the opportunity to purchase the number of carbon credits required to offset their annual GHG emissions from car travel (one carbon credit represents a tonne of CO_2 saved from emission to, or absorbed by the environment). The money raised will support external, independent projects to reduce emissions by the same amount.[9] In addition to the positive work of companies such as BP, the British government recently committed to offsetting the emissions from international air travel by 2006 by investing in renewable energy and energy efficiency projects[10] and the travel

[7] http://sd-commission.org.uk/communitiessummit/show_case_study.php/00063.html
[8] http://www.greenbiz.com/news/reviews_third.cfm?NewsID=28097
[9] http://www.edenproject.com/6086_6136.htm
[10] http://www.defra.gov.uk/news/2005/050307b.htm

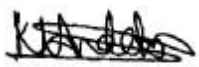
emissions associated with the recent G8 summit in Gleneagles are also to be offset. Likewise London has committed to make the 2012 Olympics effectively climate neutral.

All potential measures to reduce the impact of transportation on the global climate have both strengths and weaknesses. Technological advances are unlikely to provide a 'silver bullet' immediately but in the longer term potentially offer the biggest solution. Switching fuels can reduce emissions but, with the multitude of fuel options available, these vary in efficiency and viability. Whilst a number of organisations have demonstrated that modal shifts and transport planning are effective, these are only realistic on a small scale unless there is a fundamental change in public perception about the role of automotive transport in society.



Whilst an extremely challenging issue to confront, to avert dangerous climate change it is imperative that innovative leadership in reducing transport-related emissions promptly gives way to large scale change. It is most likely that this will occur if a combination of strategies is implemented simultaneously. Best technology is likely to be most effective if it is supported by fuel taxes, or a reduced rate in tax for low carbon vehicles - but only if the revenues are reinvested to fund R&D into further advancements. Promoting the switch to low carbon transport will only work if the consumer can be reassured that their investment will lead to further positive results and/or more economic benefits.

The case studies presented in the following pages are just three example of good practice and there are many other innovative schemes to reduce transport emissions which demonstrate the flexibility of these approaches. In the coming months and years The Climate Group will continue to highlight the increasing number of positive examples in this field. This, we hope, will enable policymakers and transport planners to make increasingly ambitious attempts to cut transport's impact on the climate.



Mark Kenber, Policy Director Karen Anderton, Researcher

"KEEPING THE WORLD MOVING IN THE 21ST CENTURY WHILST GETTING EMISSIONS DOWN IS AT THE HEART OF THE CLIMATE CHANGE CHALLENGE. THE OPTIONS ARE ALREADY THERE AND THE CLIMATE GROUP IS LOOKING TO WORK WITH THE RIGHT LEADERS TO PUT THEM IN PLACE"

DR. STEVE HOWARD,
CEO, THE CLIMATE GROUP

"LARGE CITY GOVERNMENTS LIKE THE GLA ARE A CRUCIAL PLAYER IN CLIMATE CHANGE MITIGATION. POLITICAL LEADERSHIP AND PUBLIC ACTION CAN EFFECTIVELY ACCELERATE CHANGE AND STEER THE WAY TOWARDS A LOW CARBON FUTURE"

NICKY GAVRON,
DEPUTY MAYOR OF LONDON

"TOYOTA IS LEADING THE INDUSTRY IN BRINGING INNOVATIVE TECHNOLOGY, LIKE HYBRID, TO MARKET. TAKING A TECHNOLOGICAL LEAD HAS REAL BENEFITS FOR THE COMPANY, THE CONSUMER AND OBVIOUSLY OUR ENVIRONMENT"

GRAHAM SMITH,
MANAGING DIRECTOR,
TOYOTA (GB) PLC.

"PFIZER HAD MAJOR PLANNING REASONS FOR TAKING ACTION TO REDUCE ITS TRANSPORT EMISSIONS, BUT MANAGEMENT OF OUR TRANSPORT'S CLIMATE IMPACT IS AN EXTENSION OF OUR OTHER ENVIRONMENTAL WORK"

JOHN ELLIOTT,
FORMER TRANSPORT
AND PLANNING MANAGER,
PFIZER UK

> Toyota Motor Corporation (TMC)

Since the Toyota automotive business sprang from a period of economic difficulty in Japan in the late 1930s, its business model has been based on limiting waste and 'lean, clean' manufacturing. Today as well as its own brand, Toyota is also responsible for Lexus, Daihatsu and Hino amongst others. The company has 15 plants in Japan, 51 manufacturing companies in over 26 countries with a market in over 170; yet its sustainable ethos has remained central to global operations. Toyota affirms the importance of carrying out top-level environmental action at the development and design, production, sales, and disposal stages of a vehicle's life cycle.

SECTOR
Automobiles and Parts

SUMMARY STATISTICS
Employees: 264,000
Global sales: 7.52 million (2004)

CARBON FOOTPRINT
1.78 million tonnes of CO_2 equivalent from both production and non-production areas (2004)

TARGETS
> Toyota will strive to become a leader of global regeneration through its outstanding environmental technologies.

REDUCTIONS / ACHIEVEMENTS
> 2.5% reduction in CO2 from global energy consumption between 2002 and 2003
> Across the European business energy savings and increased production volumes have resulted in a 35% reduction in energy use since 2001 - to 1560 kWh per car in 2004.

COST SAVINGS / BENEFITS
> Not documented

The freedom of mobility afforded by the invention of the automobile has led to unprecedented social and economic development over the past century. Nevertheless according to Graham Smith, Managing Director of Toyota (GB) PLC, the UK sales and marketing business "For the automobile to remain a positive force for progress, the automotive industry *must* make the environment a priority management issue. Toyota believes this is the only way automakers can successfully meet the challenges of the future".

Toyota adopted the 'Global Vision 2010' as a medium- to long-term management direction and target to which all Toyota employees should strive. One "Global Vision" objective is that "Toyota will strive to become a leader of global regeneration through its outstanding environmental technologies." This includes dealing with its own carbon footprint and that of the vehicles it sells.

Toyota's strategy for improving its CO_2 performance is based on technological developments, such as the improved fuel efficiency of both diesel and petrol engines and wider use of hybrid technology plus increasing consumer awareness of low emission vehicles through advertising and marketing. Commitment and extensive R&D have allowed Toyota to take a leading role in developing and marketing new technologies and designs that limit the environmental burden of its products. Progress towards Toyota's goals is detailed in the annual Toyota Environmental and Social Report available at http://www.toyota.co.jp/en/environmental_rep/05/index.html

PRODUCTS
A number of auto-manufacturers are attempting to reduce the climate impact of their products, through voluntary agreements that set standards for fuel efficiency. The European Automobile Manufacturers Association (ACEA) Agreement seeks a gradual reduction in emissions from new vehicles sold in Europe to attain a target of 140g CO_2/km by 2008. The Japanese Automobile Manufacturers Association (JAMA), of which Toyota is a member, has signed a voluntary agreement with the EC to reach this target by 2009, with an intermediate reduction of between 165g CO_2/km and 175g CO_2/km by 2003. JAMA achieved a figure of 171g CO_2/km in 2003, indicating that the association is on track to meet the 2009 target.

Toyota is currently working to achieve this voluntary target by 2009 within the context of its own 2010 Global Vision and zero emissions vehicle goal through, in part, increasing the mix of hybrids within its model line up. The company fully supports these voluntary obligations and is working with the EC to determine how to take voluntary agreements forward post 2009. As Graham Smith explains; "this voluntary scheme has helped business react effectively to the challenge before us. Toyota's positive reaction can be seen through the

progress already made in terms of new technology and CO_2 savings, not just in respect of the Toyota and Lexus product ranges but also in many other areas of the business."

Toyota pioneered the world's first mass produced petrol/electric car with the Prius which went on sale in Japan in 1997 (Prius I), two years before any other manufacturer. The second generation Prius went on sale in 2003 and in Europe in 2004. European sales for 2005 are expected to more than double those of the previous year. Toyota views hybrid technology as neither a niche product nor merely a stepping stone to fuel cell technology, but rather a viable, stand alone technology that can improve the efficiency of most fuels.

Driving a new Prius saves roughly 1 tonne of CO_2 per year as compared to a diesel vehicle or 1.9 tonnes compared to petrol vehicles, based on average driving patterns. Global sales of the new Prius totalled 132,703 in 2004; considering that one tree absorbs around 14kg of CO_2 each year, Prius drivers in 2004 alone did the job of some 9,478,800 trees.

As well as the Prius, Toyota has made other significant investments in hybrid technology selling over 380,000 hybrids in total, with the Estima, Camry and the Highlander in Japan and the US. The Prius and Lexus RX 400h are available in Europe as well as the Japanese and US markets. In addition, a new small car, the Aygo has been introduced in Europe with CO_2 emissions of only 109g/km.

Toyota has also developed Eco-VAS (Eco-Vehicle Assessment System) a valuable environment management tool for those responsible for vehicle development and allows comprehensive assessment at each stage of the development process of the impact of each vehicle on the environment through its life cycle. Toyota applied Eco-VAS for the first time to the Vitz in 2005 (known in Europe as the Yaris).

TRANSPORT AND PLANNING

An inventory was started in 2004, tracking CO_2 emissions from the company's vehicle logistics process and consolidated reduction targets for FY2005 have been set with 2010 targets under development. The inventory allows Toyota to identify where effective CO_2 reductions can be made. Many different solutions have been implemented, such as the increased use of rail transportation during logistic operations.

In the USA, Toyota Logistics Services' Port Newark (N.J.) Vehicle Distribution Center was reopened in May 2005 after a $20-million expansion. Initiatives developed at the center designed to reduce operational climate impact include electric powered RAV4 EV shuttles for transportation around the facility and a strict no-idling policy.

In Europe, the distribution of parts is organised in two different flows; distribution from suppliers to manufacturing plants for assembly of vehicles, engines and transmissions and distribution of spare parts and accessories to retailers. Because the delivery of parts to both plants and retailers is the responsibility of Toyota and not the suppliers, more efficient and optimised route planning can be implemented, allowing for more control over tracking and reducing CO_2 emissions.

ENERGY EFFICIENCY

Through measures including the implementation of energy conserving technologies into various facilities, consolidation of production lines and a shortening of processes in newly established lines, Toyota aims to reduce the CO_2 emissions from its own operations by 15%.

In June 2005, Canadian Autoparts Toyota Inc. (CAPTIN), a wholly owned subsidiary of the Toyota Motor Corporation, was designated a Power Smart Certified customer for its achievements in energy efficiency. Since 2003, CAPTIN has saved $110,000 in annual costs through proactive energy management including measures such as: retrofitting office and plant lighting; installing of occupancy sensors; connecting HVAC units and the plant's lighting system to an expanded control system, and optimising the compressed air system.

COMMUNICATIONS

In 2003, Toyota embarked on its first pan-European corporate advertising campaign. Spanning an initial three-year period (2003-2005), this campaign - "Aim: Zero Emissions" communicates Toyota's aspiration to reduce emissions in all its areas of activity, from design and planning to recycling of end-of-life vehicles.

In 2004, the campaign widened to include television. Focusing on "Green Design", a series of advertisements appeared on three pan-European television channels. To support the "Aim: Zero Emissions" message – Toyota created an Environmental Brochure in early 2004. This brochure was designed to target the general public and was translated into nine different languages, presenting Toyota's basic environmental messages with a clear focus on the environmental technologies that are beneficial to consumers.

Toyota also carefully collects and analyses customer-satisfaction data, to better understand customers' purchasing decisions and thereby hone an ever-more successful marketing strategy for the various Toyota and Lexus models. Even if consumers still do not see GHG reduction as a top purchasing priority, initiatives such as "Aim: Zero Emissions" help raise consciousness together with the roll out of hybrid technology, education, government action and other initiatives such as the eco-label.

The eco-label is a new UK initiative, which grades cars on their fuel efficiency and will play a key role in informing UK consumer purchasing behaviour. The label was available on all Toyota and Lexus models in all UK retail outlets on 1st July 2005. The scheme was pioneered by The Low Carbon Vehicle Partnership (LowCVP), a partnership of organisations from the automotive and fuel industries, governments, academia, environmental NGOs and other stakeholders who are working together to achieve the shift to a low carbon economy. As Chairman of LowCVP, Graham Smith has been instrumental in the success of the collaboration to date. The eco-label aims to increase public awareness of the environmental impact of their purchasing choice but this process could be assisted by the re-introduction of the UK's Powershift scheme, which provided grants to the purchasers of the most environmentally friendly vehicles.

FUTURE PRIORITIES

TMC's Fourth Environmental Action Plan (FY2006-10) is a clear statement of the activities Toyota must undertake to achieve all of its goals, including global CO_2 management. Environmental management will remain integral to the company's philosophy. According to TMC's new President Katsuaki Watanabe, "The benefits of this approach will be the fulfilment of a dream; a vehicle that makes the air cleaner the more one drives it." There is a long way to go to meet Toyota's goal of zero emission transport but with the company continuing to lead the research and development of the technological advances needed, this low carbon vehicle future is sure to be realised.

> Pfizer Ltd. UK

Pfizer Inc. is a research-based, global pharmaceutical company that employs approximately 122,000 people with operations in over 150 countries. In 2004, overall investment in R&D was estimated at $7.9 billion - the largest of any pharmaceutical company and of any private sector research institution in the world.

Pfizer Ltd, the UK principal subsidiary to Pfizer Inc., is the largest pharmaceutical company in the UK directly employing over 6,000 full time staff. Of these, approximately 3,600 are based at Sandwich in Kent, Pfizer's European headquarters for Research and Development and a significant manufacturing base.

Pfizer is increasingly recognised as a proactive corporation, integrating social awareness into its business ethos. With regard to emission reductions, the company has implemented comprehensive energy efficiency plans and recycling schemes, and a waste-to-energy plant has also been built. Yet the integrated transport plan developed at its Sandwich facility over the past few years has redrawn the boundaries of what can be achieved in corporate transport management.

Pfizer's Sandwich facility recently experienced a period of massive expansion, which could have been devastating to the local infrastructure. Yet, by taking decisive action to reduce the impact of the company's traffic on the surrounding areas and implementing a groundbreaking transport plan, the Kent-based facility has become a world leader in proving that acting to reduce the environmental impact of transport is both possible and commercially viable.

SECTOR
Pharmaceuticals

SUMMARY STATISTICS
Full time employees: 6,000
(3,600 at European HQ in Sandwich, Kent)

CARBON FOOTPRINT
150,000 tons CO_2 equivalent (2004)

TARGETS
> Reduce traffic (car use) by at least 10% by 2003, on 1998 baseline (Pfizer's Sandwich Plant)
> Company-wide goal of reducing CO_2 emissions 35% per $ million of sales by 2007 on 2000 levels
> Meet 35% of the company's global electricity needs by 2010 through "clean" energy sources

REDUCTIONS / ACHIEVEMENTS
> 15% traffic reduction on 1998 levels (2005), target reduction achieved by 2001

COST SAVINGS / BENEFITS
Cost savings from reduction in parking provision pay for 'parking cash out' bonus system paid to staff changing to more sustainable travel modes. Site expansion would not have been possible without the sophisticated travel plan.

As John Elliott, former Transport and Planning Manager of Pfizer Ltd. explains; "We had major planning reasons for taking action to reduce our transport emissions, we needed to look at the impact of our traffic on local communities, yet management of the environmental impact of our transport can also be seen as an extension to our other environmental work."

TRANSPORT AND PLANNING
Initial action focused on devising a set of policies to decentralise the site's transport and identify the areas that would reduce traffic and thus emissions. Through assessing the level of emissions coming from different areas of its transport, Pfizer identified that both staff commuting and the activities of its pharmaceutical sales force were generating the lion's share of emissions. Consequently, providing the company's sales teams with lower emission vehicles in a move to minimise the impact of their activities and staff travel emissions became the company's priority target.

> Demand Management
Pfizer Ltd. set to reduce traffic going in and out of the Sandwich facility by at least 10% on 1998 levels by 2003, a target which was met in just two and a half years. In 1998, Pfizer consulted transport expert

John Whitelegg at the outset of its ‘Green Transport Plan’ development and all staff were given questionnaires to fill in. This first round of the questionnaire was followed by focus group consultations with staff and discussions with the local authorities. These consultations led to the implementation of a system designed to encourage staff out of their cars by making viable alternatives to private car use readily available. As Elliott explains, “We developed a set of ‘choice indicators’ which encouraged staff to ‘do whatever you can, when you can’. We did not want to demand action from our staff as at the time it was unrealistic to do so.”

These ‘choice indicators’ graded alternative modes of transport as either green, amber or red, with the most incentive allocated to the green modes. Green modes were identified as walking, public transport – buses, trains (because they are available to all) and cycling. Amber modes were car sharing and motorcycling with red being saved for single occupancy car use. It was important to Pfizer to make the shift as easy as possible but to maintain the clear message that employees should travel as “greenly” as possible.

> Financial Incentives

Whilst reluctant to make employees pay for parking and at the same time striving to reduce traffic, Pfizer decided not to charge for parking, but rather to level the playing field by paying employees £2 a day to leave their cars at home. As Elliott explains, 'It costs Pfizer more than £2 a day to provide a parking space - for the security, planting, lighting, white line painting and so on - so in that way it's cost neutral. There was also a 'deadweight' cost for those people who never came to work by car - they are now entitled to the £2.' Similarly, for employees taking up car-sharing, all passengers (but not the driver) are given £2, to underline that whilst a preferable option, it is not the optimal choice.

>Supplementary Measures

The scheme is supported by a company bus service to most towns and main villages within 15 miles of the Sandwich site and a site database to provide car-sharing opportunities, together with meeting point shelters. Pfizer has also organised fare discounts for employees on some local bus and train routes and has provided facilities for cyclists (see below).

At its introduction in 1999-2001, the transport plan was well received by staff. Since then the plan has been strengthened: new bus services have been introduced and Pfizer has worked with Sustrans, the sustainable transport charity responsible for the National Cycle Network, to provide safe cycle routes. The Ramsgate-Sandwich section of their network is now one of the busiest links on the entire network. Pfizer also runs motorcycle training for adults and is presently exploring possibilities for cycle training.

On the infrastructure side, since 2001, bicycle ‘air locks’ have been provided through the security cordon so that cyclists can bring their bikes right to the ‘front door’. Similarly, ‘car share’ spaces have been situated closer to the building than spaces for single occupancy cars. Although travel is still essential for many meetings, Pfizer has also made significant investments in state-of-the-art video conferencing facilities. This maintains some of the benefits of personal interaction, while reducing the need for travel.

SUCCESS

The impacts of the plan are measured by the security and car park management system that monitors the ratio of people to cars on site. According to Pfizer’s first travel survey in 1998, the number of cars coming onto its Sandwich site for every 100 staff was 75. By the April 2001 survey this number had dropped to 68. The number has now stabilised at about 66. As a result, the company successfully cut the need for about 400 parking spaces. Financially, Pfizer can potentially save £1.2 million (€1.7 million) in capital costs (excluding land) and £500 (€700) per parking space per year in car park running costs. As a result of this success a similar plan has also been implemented at the company’s Walton Oaks site in Surrey, where the parking cash out scheme gives employees £5 a day to leave their cars at home.

CHALLENGES/BARRIERS

Whilst the results achieved by Pfizer are impressive, there have been a number of obstacles to further action being taken. Kent County Council has been very supportive of Pfizer's transport management and its initial Green Transport Plan included a bus/High-Occupancy Vehicle (HOV) lane on the route from the Thanet towns as an integral part of the overall strategy. This lane, however, has not yet been introduced, partly as a result of pressure on the Council from a local campaign about the implications of the lane for other traffic. Nevertheless, the company hopes that the issue can be resolved and that the next component is operational in the coming months.

Pfizer has also faced challenges when negotiating contracts with local bus companies. The part-monopolies often granted to these commercially-driven businesses means that they are able to charge premium rates, raising the cost of the scheme. As a result, Pfizer now provides buses contracted through a private coach operator, but the poor connectedness of bus operations outside London with the rest of the integrated transport system makes it difficult for the company to make greater use of the public network.

Despite these difficulties, Pfizer's travel plan has been a success. It was groundbreaking when it was launched and in many ways remains so today. It is not however, a complex idea and there is considerable scope for both replication in other companies and expansion through links with other company schemes and partnerships with local transport authorities. Most importantly, Pfizer's transport plan has demonstrated that economic success can be decoupled from rising emissions: while cutting its greenhouse gases the company has become the largest pharmaceutical business in the world, with the Sandwich facility having tripled in size over the past 15 years.

> Greater London Authority (GLA)

London, the capital of the UK, consumes as much energy annually as Greece. Cities are generally perceived as dirty and environmentally unfriendly areas, although due to the high concentration of people and activities, urban infrastructures have the potential to be both highly environmentally and economically efficient. With the capital's economy continuing to grow, London's Mayor Ken Livingstone, through his 'Mayor's Energy Strategy' is developing a number of measures to demonstrate this potential through the uptake of low- and zero-emissions vehicles, energy efficiency measures and renewable energy. Confirming its long term commitment to addressing climate change, the city launched the London Climate Change Agency in June 2005.

London's transport is responsible for only 20% of all CO_2 emissions in the city, with 70% coming from construction, energy use from buildings and appliances. Yet unlike energy supply which is still primarily a nationally regulated sector, transport is an area that the Greater London Authority (GLA) has direct control over through the functional body 'Transport for London' (TfL). By implementing a host of diverse and innovative mechanisms TfL is actively reducing greenhouse gas emissions from London's transport network.

London has committed itself to an investment of £10 billion to improve its transport infrastructure over the next five years (2005/6-2009/10). TfL has already proved itself able to deliver the change London needs; in the last four years it has implemented the world's largest congestion charging scheme and transformed the city's buses.

SECTOR
Municipal Government

SUMMARY STATISTICS
Population: 7.4 million (2004)

CARBON FOOTPRINT
41.9 million tonnes CO_2 equivalent (2002)

TARGETS
> Reduce municipal CO_2 emissions 20% by 2010 on 1990 levels
> Reduce municipal CO_2 emissions 60% by 2050 on 2000 levels

REDUCTIONS / ACHIEVEMENTS
> 7% reduction in municipal CO_2 emissions between 1990 and 2000
> 19% reduction in traffic CO_2 emissions within the congestion zone by 2004 on 2003 levels

COST SAVINGS / BENEFITS
To date more than £170 million in net revenues from the congestion charge scheme has been invested in public transport improvements, primarily in the bus network.

TRANSPORT AND PLANNING

> Congestion Charge

Introduced in 2003, London's congestion charge scheme encourages travellers to use public/non-motorised transport or 'cleaner' vehicles, instead of cars and vans, in the city centre. Money raised by charging drivers £8 a day (up from £5 in the programme's first year) to enter the zone at peak times is invested in public transport. Since 2003, traffic in the zone has been reduced by 15% and congestion by 30%; car movements within the zone have fallen by 65,000-70,000, equivalent to a 30% decrease. The scheme encompasses an incentive for private car users to switch to cleaner fuels with a number of alternative fuel vehicles receiving a 100% discount on the charge. Approximately 4,300 vehicles are registered to take advantage of this discount. The congestion charge is estimated to have reduced traffic-related CO_2 emissions within the zone by 19%. To date more than £170 million in net revenues generated by the charging has been re-invested, primarily in the bus network with the result that bus passenger numbers have increased by 37% during charging hours. These figures are testament to the success of the scheme and to the modal shifts possible under a stable infrastructure.

>Bus Network

Since 2000, TfL has invested heavily in its bus network to meet the short-term rising demand for public transport. Since 2004 alone, 59 new bus lanes and 201 new sets of bus priority signals have been introduced to the city's streets. Whilst an increase in buses on London's roads will result in increased emissions from these buses, if the modal shift from cars to these buses is effective, an overall emission reduction will be

achieved as there will be fewer cars on the road. There was a 40% increase in bus passenger usage between 2000-2005, equivalent to 1.5 million trips per day, suggesting that this shift is occuring.

London is also participating in a pioneering project to test the first generation of zero-emission fuel cell buses. Fuel cell buses are running between Covent Garden and Tower Gateway until December 2005. As conventional diesel buses already operate on this route, performance of the vehicles can be accurately compared. The three fuel cell buses first went into service in January 2004 on route 25, running additionally to the normal service. However, the buses proved so reliable that they were switched to route RV1, running as part of the normal timetable. The fuel cell buses have definitely had a huge impact in drawing people's attention to the technology and the London Hydrogen Partnership is currently developing a business plan detailing how hydrogen can be introduced effectively into the transport infrastructure on a large scale. TfL is considering the range of technologies which may be developed in the future, with hybrid engines being the current priority.

> Modal Shift

Overall, between 1999 and 2004, public transport trips increased by 23%. The share of car journeys as a total of trips in London fell from 47% to 43% by 2004, with total public transport share increasing from 30% to 35% over the period.

The Mayor hopes to make London one of the world's most walking friendly cities by 2015 and to achieve an 80% increase in cycling by 2010. More than 5.5 million trips a day are made on foot in London – more than are made by London Underground, Docklands Light Railway and National Rail in London combined. There are 300,000 trips a day by bicycle in London, although the level of cycling is low compared to other European cities: only 1.1% of journeys compared to 10% in Berlin and 28% in Amsterdam. However, there was a 23% increase in cycle trips on Transport for London roads in 2004 and there is considerable scope for development. Initiatives such as the pedestrianisation of Trafalgar Square, a 70km extension of the London cycle network and reviewing of traffic signal timings to allow increased crossing time for pedestrians, all reinforce the viable alternatives to road travel in the city.

> Travel Planning

To strengthen the effectiveness of TfL's efforts to increase modal shifts, the Mayor of London has highlighted the importance of encouraging large employers to expand their travel planning schemes. A large number of public and private organisations, including BAA at Heathrow, GlaxoSmithKline and the BBC, are now implementing work-based travel plans, providing incentives for their employees, customers and suppliers to leave their cars at home. Employers are hugely influential and by promoting alternative commuting options, they have an important role to play in changing attitudes. The 'good going' campaign http://www.goodgoing.co.uk is a further initiative aiming to promote sustainable transport options throughout the capital.

> Lower Emissions Schemes

The Mayor has developed a Taxi Emissions Strategy to reduce emissions from London's 20,000-strong taxi fleet by up to 50% by the end of 2007. This can be achieved by having cab owners invest in a new cleaner vehicle sooner than planned, fitting abatement technology or converting to run on alternative fuels. Funding for the programme is provided through a small environmental surcharge on each fare, initiated in April 2005. By 2007, the city will have implemented a low emissions zone, reducing the collective impact of coaches, lorries, buses and taxis.

ENERGY EFFICIENCY

The GLA, through its functional bodies, is responsible for a large portfolio of buildings including bus stations, tube stations, fire stations and police stations across the capital. To limit the operational emissions from the city's facilities, the GLA has introduced a number of schemes to address its own climate impacts. London

Underground, for example, runs an 'Energy Challenge' encouraging stations, groups and lines to save energy through measures such as switching off lights and stopping escalators outside peak hours. In the first year (2001), energy use reduced 11% and in 2003/4 this increased to 21% exceeding the target of 17.5%. For 2004/2005 period the station energy reduction target has increased to 20%. In addition, 40% of the Underground train fleet uses regenerative braking (which saves 20-25% of energy that would otherwise be lost as heat) and all new rolling stock will have regenerative braking as standard.

TfL is implementing a programme through which all new bus drivers are to undergo BTEC training to teach them how to improve the energy efficiency of buses. TfL is also trialling LED traffic signals which are more energy efficient than conventional signals. Testing will continue for the next 3-4 years.

RENEWABLE ENERGY

In 2003/4 TfL procured 16% of its electricity from renewables and expects this figure to increase to 20% for 2004/5. In addition to procurement, TfL has encouraged the use of solar power for lighting bus stops and bus shelters not connected to the national grid. From 2005 1,400 stops will be upgraded per annum, with 7,000 illuminated bus stop timetables and flags in place by 2010. Two solar powered roadside ticket machines are also on trial and further machines will be installed as the need arises. TfL has also invested in PV installations such as those built on the roofs of the Vauxhall Cross interchange and Walworth bus depot.

CHALLENGES/BARRIERS

The legislative context in which GLA/TfL operate has presented a challenge to the implementation of proactive measures in the city. Inheriting the PPP agreement on the London Underground with its complex set of commitments concerning upgrading the tube over an extended period of years could also be seen as a limiting barrier. Because TfL has had to integrate a number of different organisations which existed prior to 2000 into its remit, making progress has been more complex than would otherwise be the case. In this context, the achievements to date have been impressive.

Another challenge for London in implementing a low carbon transport strategy is the availability of funding for new technologies. A number of schemes exist to assist this, such as the EU's Clean Urban Transport for Europe (CUTE) programme for fuel cell buses, but central government support and commitment to promoting low carbon transport remains crucial.

Public perception of measures has been both a barrier and an asset. The way that behaviour is being changed by London's leadership is testament to the city's success. People are choosing to switch because there is a strong commitment to investing in public transport. Legislation is important but alone cannot change behaviour. People will only change their perception and behaviour if the means to adapt to these changes are provided.

London's approach to dealing with transport and climate change can offer pointers to other cities around the world. At the same time, London has been able to draw on the experiences of other transit networks across the globe. Singapore and Trondheim for example, provided TfL with valuable information on congestion charging before the scheme was implemented. It is clear, therefore, that forging links between cities that are showing leadership on transport and environmental issues can play an important role in ensuring that lessons are learned and best practice shared.

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