Unlocking talent

BUILDING A LOW CARBON ECONOMY

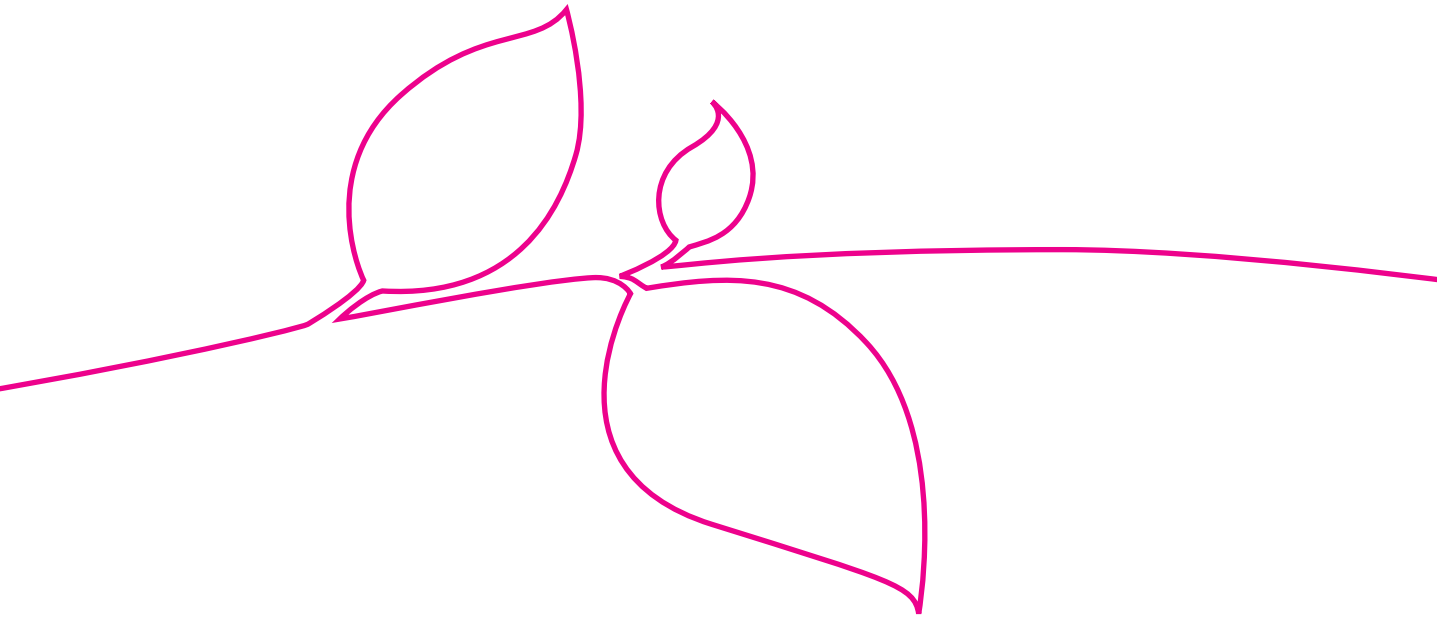
UNLOCKING INNOVATION AND SKILLS

HM Government

CONTENTS

"A greener Britain where a new green economy provides greater prosperity and high quality jobs even as it protects the environment and provides a better quality of life for all."

Prime Minister Gordon Brown
Nov 19, 2007



INTRODUCTION AND SUMMARY

Tackling climate change and the over-exploitation of our planet's resources will have a huge impact on our economies, societies and the way we live our lives.

Change is inevitable. Where we do have a choice is whether we wait until these changes are forced upon us or we act now to lessen their impact, to prepare ourselves for those already under way and to take advantage of the new opportunities opening up.

The Stern report highlighted dramatically the economic cost of delay. It found that failure to act now would cost between 5 and 20% of the world's GDP as we experienced the catastrophic impact of climate change. In contrast, the price of early action, although high, would be in the region of 1% of global GDP. And the earlier we take action, the less expensive the task will be.

That is why the Government is committed to building a low carbon economy – in Britain and globally.

A low carbon economy is not a slogan. It will entail, over the next few decades, the transformation of our lives and of our economy – as the Prime Minister has put it, a 'technological revolution' in the way we use and source our energy. And in turn – because energy use pervades every aspect of our lives - this will imply a social transformation, in the way we live.

Building a low carbon economy and society will be a huge challenge. To achieve it we need to unlock the talents of the British people and of our businesses. Only by releasing the skills, creativity, entrepreneurialism and capacity to innovate our firms, our workforce and our communities will we find the economic and social solutions to the task in front of us.

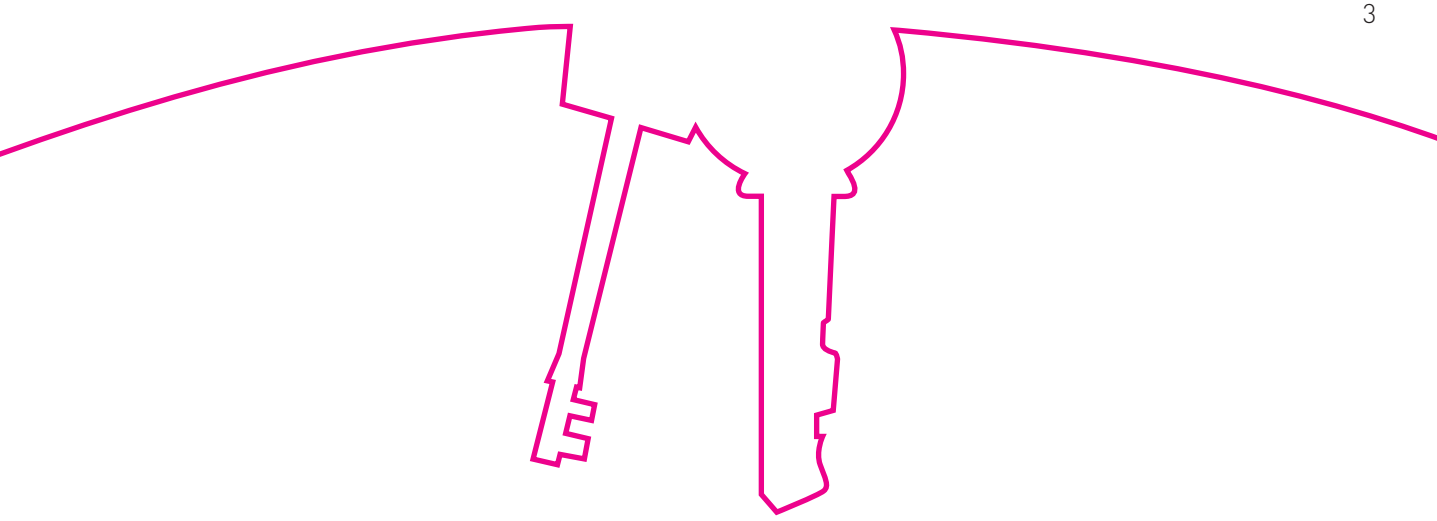
But if we do this, the benefits to Britain and to our economy will be immense.

Stern highlighted the prize for those countries capable of successfully leading the world into a low carbon future. Greater energy efficiency improves economic productivity. The demand for environmental goods and services creates new jobs and new business opportunities. The development of new green technologies will create export markets throughout the world. Such technologies indeed offer the prospect of providing new drivers for economic growth in the 21st century as previous technologies did in the last. And the nations that seize this opportunity – which can show the rest of the world how a modern economy can grow sustainably – will reap the largest rewards.

The market for environmental goods and services is already large and growing by the day. It is estimated that industries such as renewable energy, waste management and water treatment will be worth $700 billion globally by 2010 – on a par with the value of the global aerospace industry. And that's set to grow across the world as take-up of green products and services increases. By 2050, it is predicted the annual value of the global low carbon energy sector could be $3 trillion dollars.

The Government is determined that the UK will be at the forefront of this new industrial revolution, gaining the benefits in terms of jobs and economic opportunities at the same time as we improve both our own and the global environment.

We are already well placed. Estimates suggest our environmental sector is currently worth £25 billion and employs 400,000 people and could more than



double within 20 years. The City of London has become a global hub for carbon trading and the UK is also poised to become the world leader in installed capacity of offshore wind. We have a strong history of innovation and remain world leaders in scientific research. We have a stable and supportive macroeconomic climate, an improving skills base and flexible product and labour market regulation. So we are ideally placed to help minimise the costs of the move towards a low carbon, resource efficient economy while maximising the opportunities at home and abroad. And it is important to recognise that this is not just about the environmental sector narrowly defined. With greater consumer awareness and corporate social responsibility, more sustainable methods of production and goods and services are now spreading throughout the economy. As one of the leading global green consumer markets, the UK is at the forefront of this wider economic trend.

So where we can unlock talent, upgrade skills and back innovation, we can create a new role in the global economy and a new economic future for the UK. We can demonstrate how to maintain and build prosperity in a sustainable way. We can create thousands of new businesses, safeguard millions of jobs by ensuring existing businesses operate in a more sustainable and efficient way, and export our knowledge, expertise and products around the world.

It was to help chart this course ahead that the Government established in November 2006 the Commission on Environmental Markets and Economic Performance (CEMEP). Drawn from business, trade unions, universities and NGOs across a wide range of sectors, and including two Cabinet ministers, the Commission was asked to examine what we had to do as a country to ensure we were in the best possible position to seize the new opportunities, and how the Government could support this.

The result was a comprehensive report (available at http://www.defra.gov.uk/environment/business/commission/index.htm), which looked across the board at environment, competition and innovation policy. It examined what was working and what was not, where progress needed to be accelerated and co-ordination improved. The report offered urgent lessons for Government, for business and for our country as a whole. It did not shy away from recognising there would be costs but also highlighted the huge potential if we get this right.

The Government welcomes the report as a valuable contribution to thinking on how the UK can make the most of the synergies between economic and environmental objectives. Since the report was published in November 2007, the Government has made progress in a number of the areas recommended by the report. These are documented in Part 2 of this document, which is Government's detailed response to the Commission's recommendations (this document is also available in full at the Defra website given above).

Ultimately, of course, it will be the entrepreneurial drive of business and the talents of individuals and communities which will determine whether and how the UK can achieve its goal. But Government, as CEMEP made clear, has a huge role in creating the conditions where innovation is fostered and thrives, and therefore in which the low carbon economy will be built.

INTRODUCTION
AND SUMMARY

THERE ARE FOUR MAIN CHALLENGES THAT NEED TO BE MET

- Government has to set a long-term policy framework. To encourage the confidence for businesses to invest and enable the timely development of innovative products and services to speed the transition to a low-carbon economy, policies need to be long-term, clear, consistent and credible.

- Policy must positively support innovation. We need to create the conditions that allow innovation to flourish, by removing barriers and other disincentives and through support for research, development and demonstration. Supply-side innovation measures need to be complemented by demand side policies to drive innovation to meet new, low-carbon resource-efficient needs.

- The economy, and our workforce need the right skills. We have to draw on the talent and creativity of the British people and ensure that the economy has the skills it needs to be successful – vital in the short term, with some industries in this sector already reporting skill shortages, but also in the longer term as we aim for a world-class skills base.

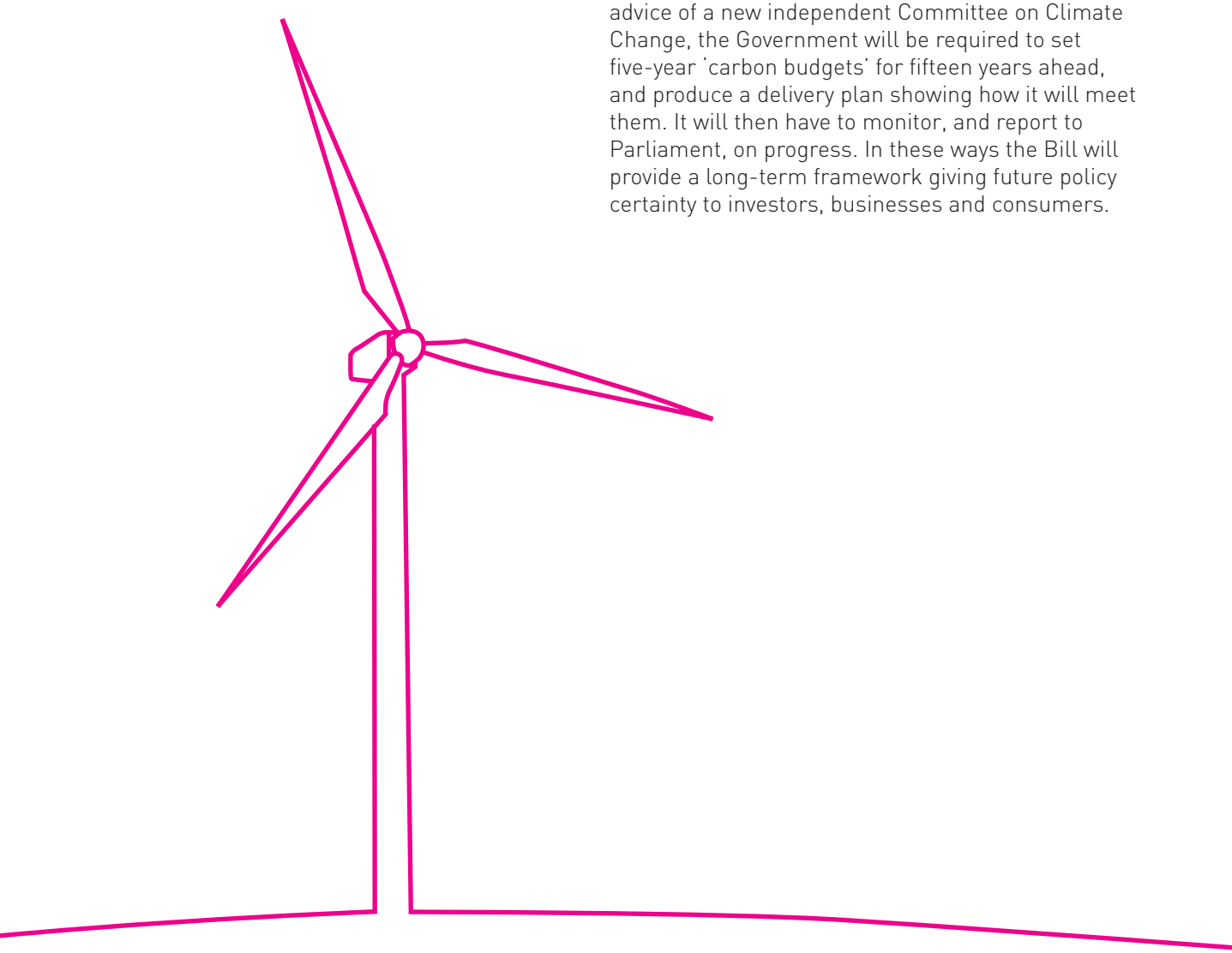
- Partnership is essential. Delivering this agenda requires collaboration between government, business, trade unions, education institutions and others.

WE ARE MAKING PROGRESS IN ALL OF THESE AREAS.

THE LONG-TERM FRAMEWORK

As CEMEP stressed in its report, clear, credible and long-term environmental goals are essential to provide industry with the framework and confidence to make the major investments needed to design and bring sustainable products and services to market.

This is the core purpose of the Government's Climate Change Bill. By putting into statute our medium- and long-term targets (for a reduction in carbon emissions by at least 26% by 2020 and at least 60% by 2050, against a 1990 baseline) the Bill makes the UK the first country to have a legally binding long-term framework to cut carbon emissions. On the advice of a new independent Committee on Climate Change, the Government will be required to set five-year 'carbon budgets' for fifteen years ahead, and produce a delivery plan showing how it will meet them. It will then have to monitor, and report to Parliament, on progress. In these ways the Bill will provide a long-term framework giving future policy certainty to investors, businesses and consumers.



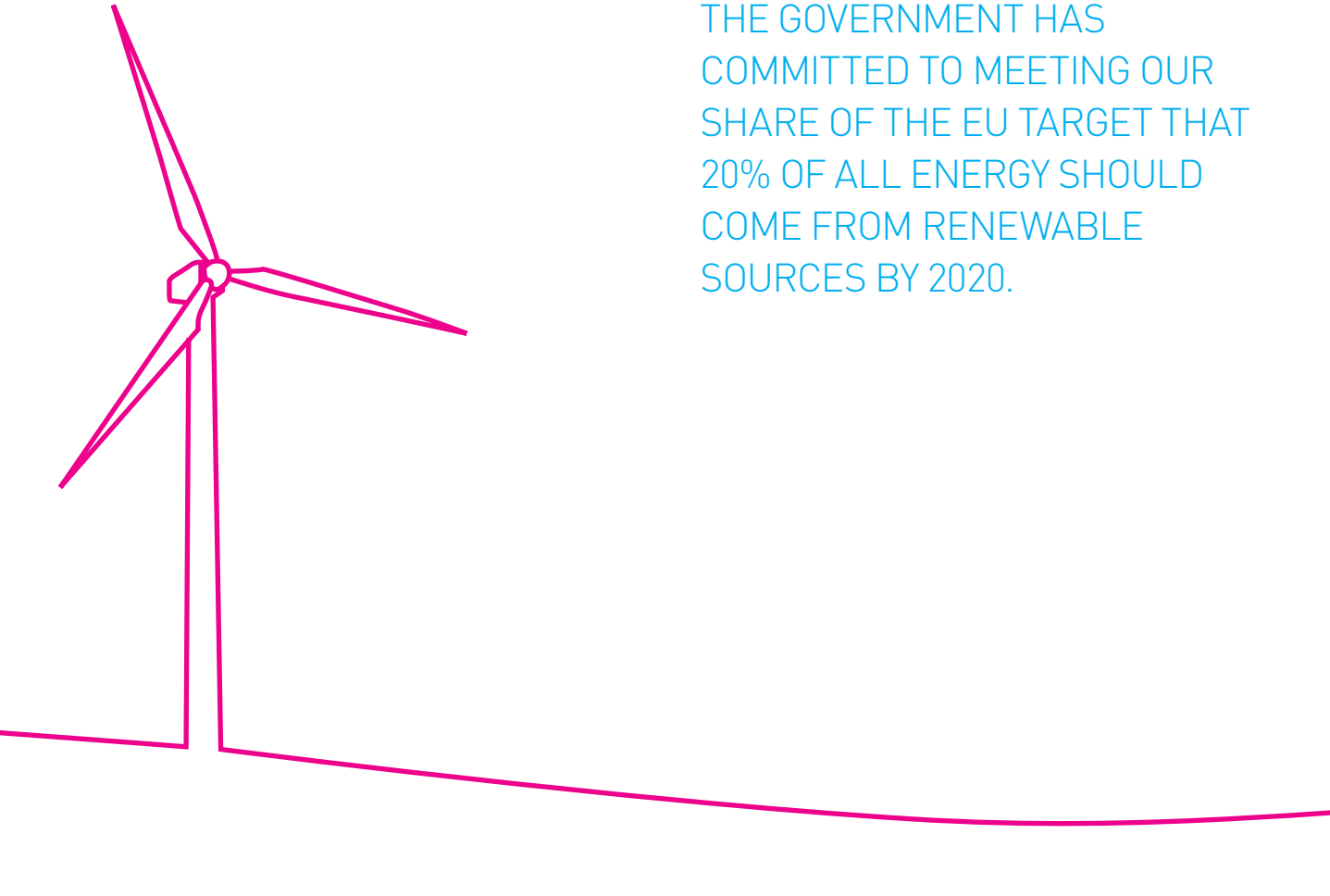
And this UK framework is now established within a clear set of European goals. By agreeing European Union-wide policy, we level the competitive playing field, give a powerful lead internationally and open up new opportunities in Britain's biggest market. With strong British support, the EU has set tough targets for a reduction in overall greenhouse gases and for increases in energy efficiency and renewable energy by 2020. The centrepiece of European policy is the Emissions Trading Scheme (EU ETS), which sets a carbon price for around half of European and UK emissions. With a declining emissions cap into the future now established, businesses in the EU ETS have a well defined framework for investment. The UK Government is pressing for international aviation to be included in the scheme.

Within the overall framework of the Climate Change Bill and EU goals, long-term low carbon policy frameworks are now being established across the economy, in energy, transport, buildings, waste and products.

The Government has committed to meeting our share of the EU target that 20% of all energy should come from renewable sources by 2020. This will mean a very major increase in renewable electricity, heat and transport. The Government will consult in summer 2008 and publish a renewable energy strategy in Spring 2009. Alongside the Government's decision to allow companies to build new nuclear power stations, this will provide a major boost to investment in low carbon energy and to jobs and business growth in both the renewable and nuclear sectors.

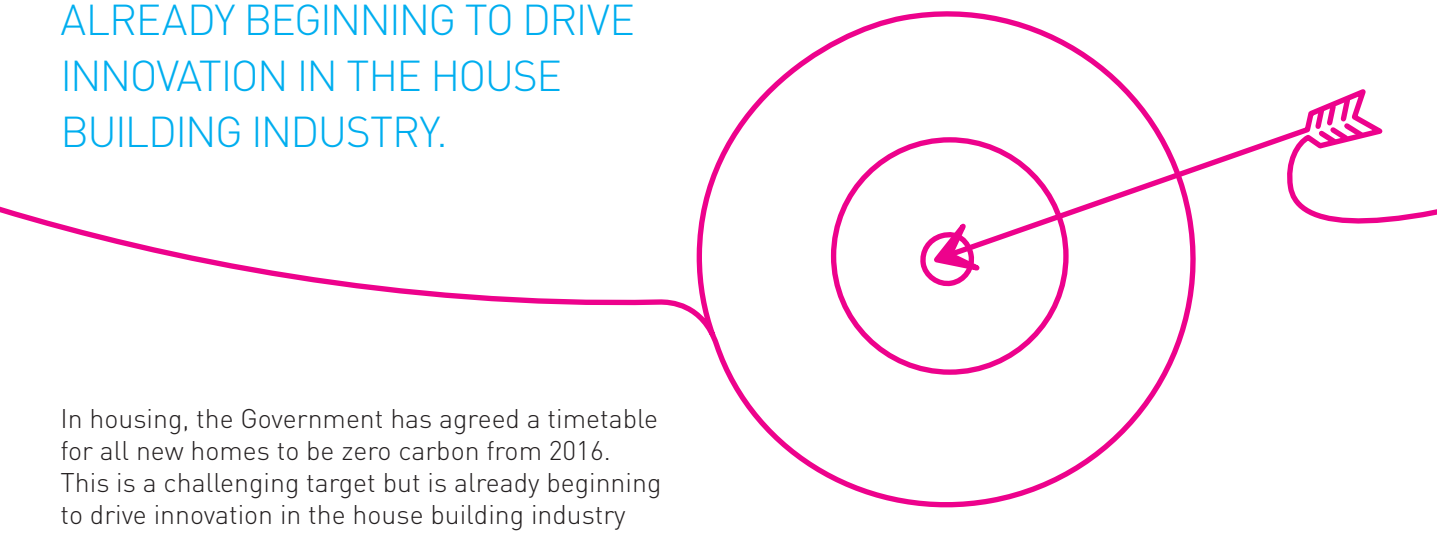
In transport, the Government seeks to drive innovation by setting longer-term and more certain targets for vehicle efficiency. The King Review concluded that the average CO_2 emission of new cars could feasibly be cut to 100g/km by 2020 (from around 164g/km now). The Government is now pressing the European Union to adopt this ambitious target.

THE GOVERNMENT HAS COMMITTED TO MEETING OUR SHARE OF THE EU TARGET THAT 20% OF ALL ENERGY SHOULD COME FROM RENEWABLE SOURCES BY 2020.



THE LONG TERM FRAMEWORK

THE GOVERNMENT HAS AGREED A TIMETABLE FOR ALL NEW HOMES TO BE ZERO CARBON FROM 2016. THIS IS A CHALLENGING TARGET BUT IS ALREADY BEGINNING TO DRIVE INNOVATION IN THE HOUSE BUILDING INDUSTRY.



In housing, the Government has agreed a timetable for all new homes to be zero carbon from 2016. This is a challenging target but is already beginning to drive innovation in the house building industry in more energy efficient building design and in the use of decentralised energy systems and microgeneration. The Government has now set out a second long-term ambition for all new non-domestic buildings to be zero carbon from 2019, with public buildings meeting this deadline a year earlier.

At the same time the Government's waste strategy has set ambitious targets to 2020 for the recycling of waste to reduce emissions from landfill sites, with the landfill tax escalator providing certainty of incentive into the future. And in the field of products, the Government is working both within the EU and with UK industry to drive up minimum standards in consumer goods. Retailers and manufacturers have already agreed to phase out energy inefficient domestic light-bulbs in the UK by 2011. The Government has now published proposals for progressively higher energy performance standards in consumer goods, and is stepping up efforts to promote these into UK and European markets.

Action in the UK: The Climate Change Bill & the Committee on Climate Change

The Climate Change Bill will put into statute the UK's targets to reduce CO_2 emissions by at least 60% by 2050 and by at least 26% by 2020, against a 1990 baseline. The Bill will make the UK the first country in the world to have a long term legal framework for driving the transition to a low-carbon economy. The Climate Change Bill will introduce, for the first time, a system of 'carbon budgeting' – capping emissions over five year periods, with budgets set 15 years ahead (beginning with 2008-12, 2013-17, 2018-22). Carbon budgets will provide businesses with increased certainty so they can plan and invest with more confidence. A new independent expert Committee on Climate Change, chaired by Lord Adair Turner, will advise Government on the most effective ways of meeting its targets, and on the level of the five year carbon budgets.

The Bill will also create powers to introduce new trading schemes through secondary legislation. These powers will be used, for example, to introduce the Carbon Reduction Commitment, a mandatory cap-and-trade scheme covering energy use emissions from approximately 4,000-5,000 large, non-energy-intensive organisations that will save 4 million tonnes of CO_2 per year by 2020.

CREATING THE CONDITIONS FOR INNOVATION

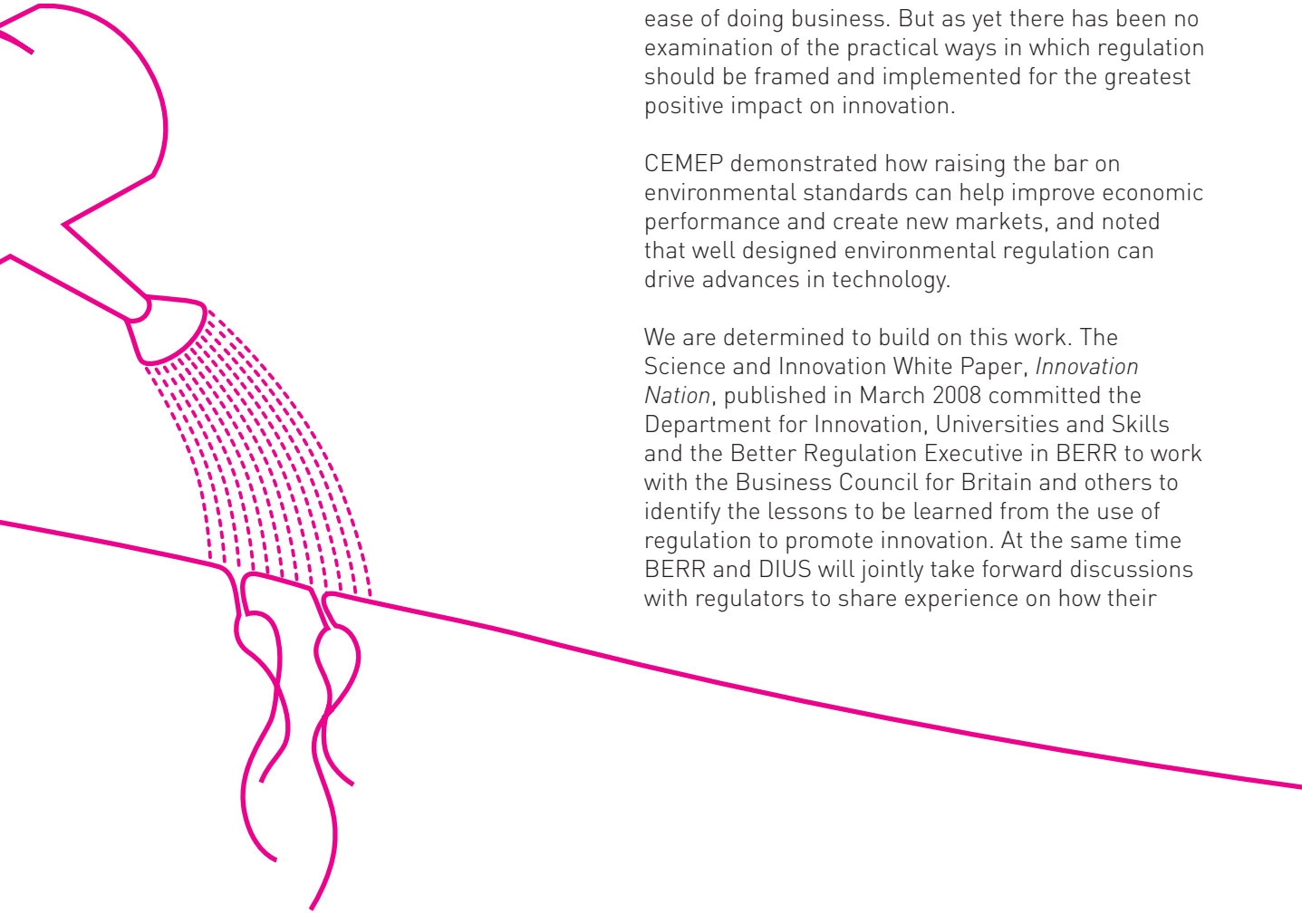
Innovation will be central to building the low carbon economy. As the CEMEP report argued, Government can support innovation through the right regulatory design, through appropriate use of public procurement, and through specific policies for research, development and demonstration of new technologies.

The role of regulation in relation to innovation is complex. It can either act as a barrier by creating additional costs, or as a facilitator of innovation by creating incentives to produce improved products and services. Putting environmental innovation at the heart of our economy requires Government to do all it can to identify and remove barriers holding back progress while ensuring the right measures and funding are developed to encourage it.

The UK enjoys one of the best regulatory environments in the world. The World Bank ranks the UK 6th overall out of 178 economies in terms of ease of doing business. But as yet there has been no examination of the practical ways in which regulation should be framed and implemented for the greatest positive impact on innovation.

CEMEP demonstrated how raising the bar on environmental standards can help improve economic performance and create new markets, and noted that well designed environmental regulation can drive advances in technology.

We are determined to build on this work. The Science and Innovation White Paper, *Innovation Nation*, published in March 2008 committed the Department for Innovation, Universities and Skills and the Better Regulation Executive in BERR to work with the Business Council for Britain and others to identify the lessons to be learned from the use of regulation to promote innovation. At the same time BERR and DIUS will jointly take forward discussions with regulators to share experience on how their

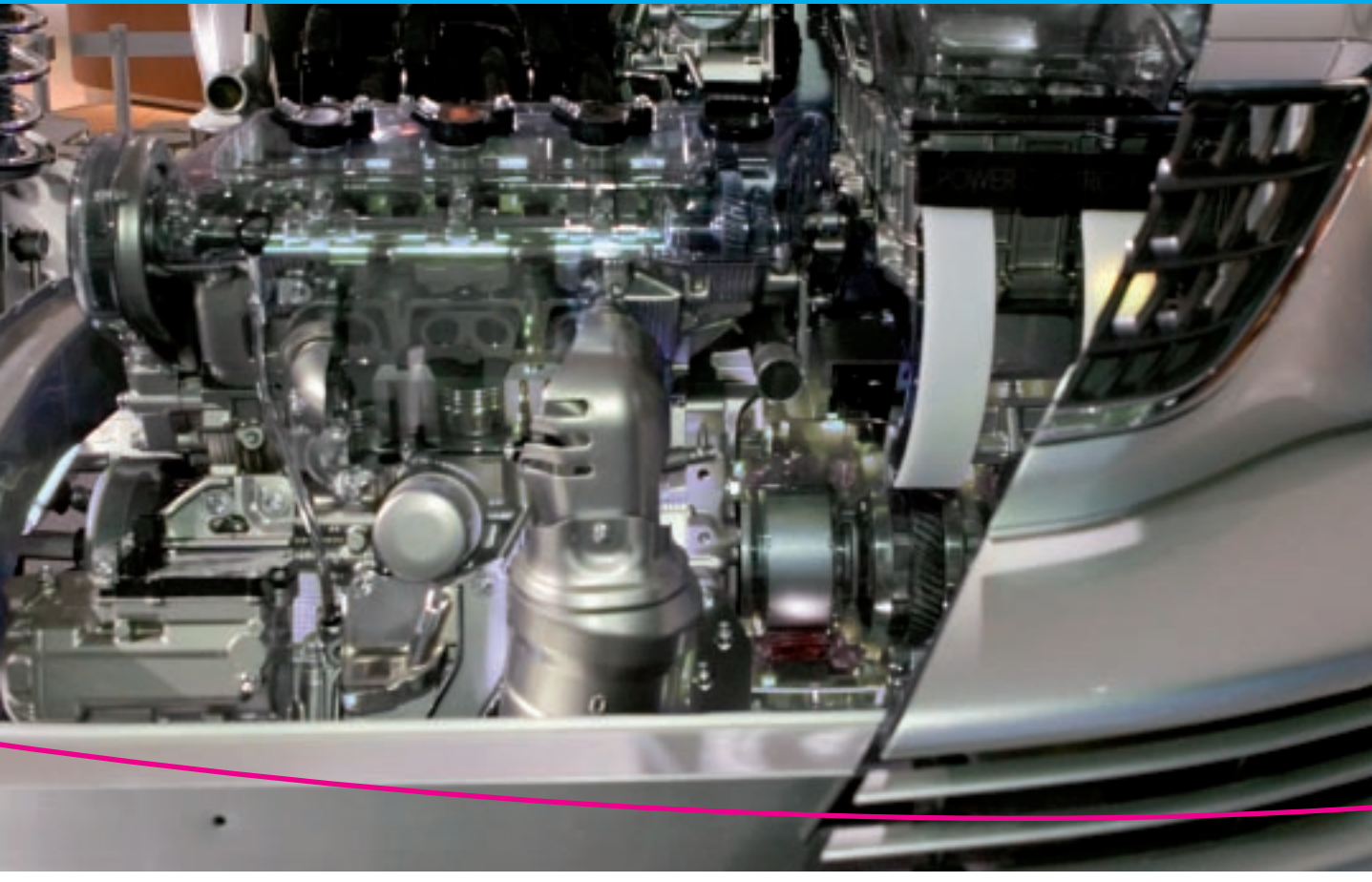


Low Carbon Vehicles Innovation Platform

The Low Carbon Vehicles Innovation Platform was launched by the Technology Strategy Board in 2007 to accelerate the market introduction of low carbon road vehicles. The aim is both to maximise the benefit to UK business and to respond to the challenges of reducing transport CO_2 emissions.

The Platform coordinates Government support mechanisms for technology development within the wider market transformation context of the Low Carbon Transport Innovation Strategy. The first activity was a collaborative R&D programme with £20 million of support from the Department for Transport (DfT) and the Technology Strategy Board, focused on bringing forward vehicle technologies that could be viable candidates for commercialisation or fleet procurement over the next five to seven years.

The next step is the launch of a Low Carbon Vehicles Integrated Delivery Programme with an initial investment of £40 million jointly supported with the Department for Transport and the Engineering and Physical Sciences Research Council. It will provide greater co-ordination of activities from university research to future potential procurement opportunities, speeding up the time it takes to get low carbon vehicle technologies into the market place. Complementary funding to enhance the scope of the demonstration activity is under discussion with Regional Development Agencies and Devolved Administrations. Advantage West Midland's Board has identified the potential for up to £30 million of additional investment in this initiative subject to the demonstration of regional economic benefits.



CREATING THE CONDITIONS FOR INNOVATION

activities can best promote innovation and draw on the support mechanisms which Government provides for innovation in business. The Government will report on progress on innovation in the Annual Innovation Report, the first of which will be published in Autumn 2008.

Government spends around £150 billion a year on buying goods and services. By demonstrating the priority given to low-carbon and sustainable products, the Government can give industry confidence to invest in their development. The Science and Innovation White Paper therefore commits DIUS to working with the Technology Strategy Board, OGC and with Departments with experience in promoting innovation through procurement, to support others to use their procurement power effectively in support of innovation. It also announced that each Government Department will put the encouragement of innovation at the heart of its procurement practices.

At the same time the Government has published a new procurement policy framework which emphasises the need for public purchasing to consider the environmental impact of goods and services bought. The 2008 Budget announced Government plans to establish a 'centre of expertise in sustainable procurement'. This Centre will be led by a new post of Chief Sustainability Officer within the Office for Government Commerce (OGC) and will help develop new and innovative ways for sustainable working, planning and procurement within the Civil Service. Defra has also announced a further £30m for invest-to-save energy efficiency schemes for public sector bodies in England over the next three years, supported by the UK Environmental Transformation Fund.

The Government is also increasing support for innovation through funding for research, development, demonstration and deployment programmes. Through the Energy Technologies Institute, the Technology Strategy Board and the UK Environmental Transformation Fund new investment is being directed into sustainable energy technology in areas such as offshore wind and marine energy technology. The Energy Technologies Institute, a new 50:50 public private partnership, has begun operation with a total budget of at least £600m over the next 10 years and aims to raise this to £1.1bn. The UK Environmental Transformation Fund, which follows from the ETI to focus on the latter stages of low carbon technology demonstration and deployment, has a budget of £400m over the next three years.

In transport for example, the next phase of the Technology Strategy Board's Low Carbon Vehicle Innovation Platform will provide £40m to support research, development and commercialisation of low carbon vehicles.

With fossil fuels likely to remain a major source of energy globally for decades to come, the Government is committed to accelerating the development of carbon capture and storage (CCS) technologies. In November 2007 a competition was launched for one of the world's first commercial-scale demonstrations of CCS on a coal-fired power station. The 2008 Budget included further funding for Clean Fossil Fuel technologies under the UK Environmental Transformation Fund.

As well as central government, Regional Development Agencies (RDAs) have a key role to play in tackling climate change and contributing to other energy policy goals within the context of their regional economic strategies. RDAs are working to capture the benefits from increasing energy and resource efficiency and to develop low carbon technology markets. They do this through their regional leadership roles in shaping regional strategies and mobilising partners, their delivery roles in supporting businesses, commercialising new technologies and innovations, and their investment roles in physical regeneration.

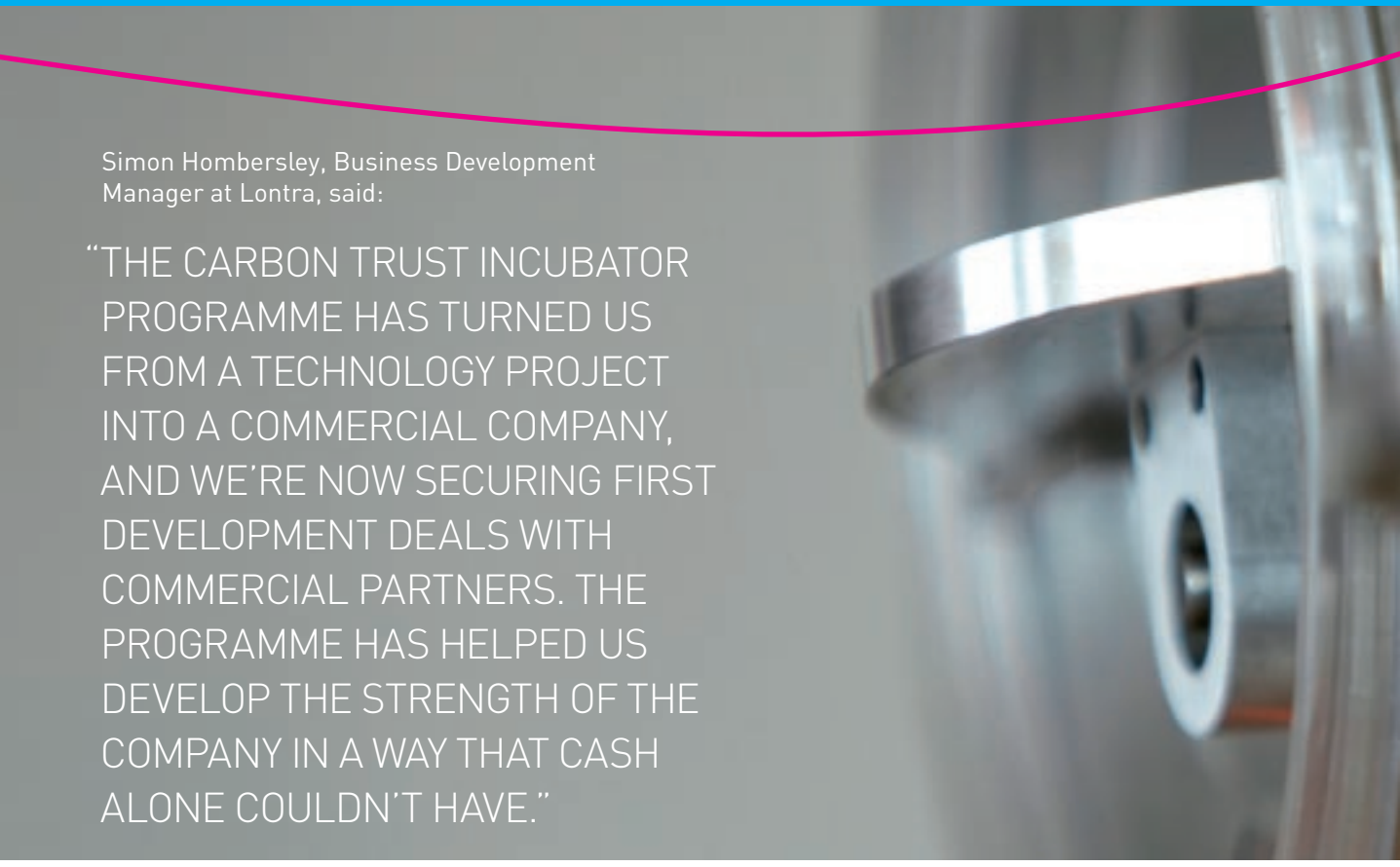
Carbon Trust Business Incubator Programme

Carbon Trust Innovations helps develop commercially viable, low carbon technologies through partnership, funding, expert advice and large-scale demonstrations. Many promising low carbon technologies are still in their infancy. By investing time, expertise and money in emerging low carbon technologies, the Carbon Trust helps bring those that are commercially viable to market earlier.

The Carbon Trust incubator scheme helps early-stage, low carbon technology companies to advance their ideas to the point where they can attract commercial investment. Since 2004 it has provided support to 57 companies. Of these, 25 have successfully raised private sector investment (worth £65m in total) and three have achieved stock market listings.

Based in London, Lontra is a clean technology company exploiting groundbreaking compressor technology. Compressed air is used to power manufacturing around the world, from pharmaceuticals and cars to everyday items such as desks and chairs. Established in 2004, the company is committed to using innovation to address environmental issues. One of its products, The Blade Compressor™, can save up to 35% of the energy normally required by compressors, all without using costly variable 'speed drives'. Based on predicted performance, the compressor could deliver CO_2 savings of 4,000 tonnes a year if it only captured one hundredth of the existing compressor market.

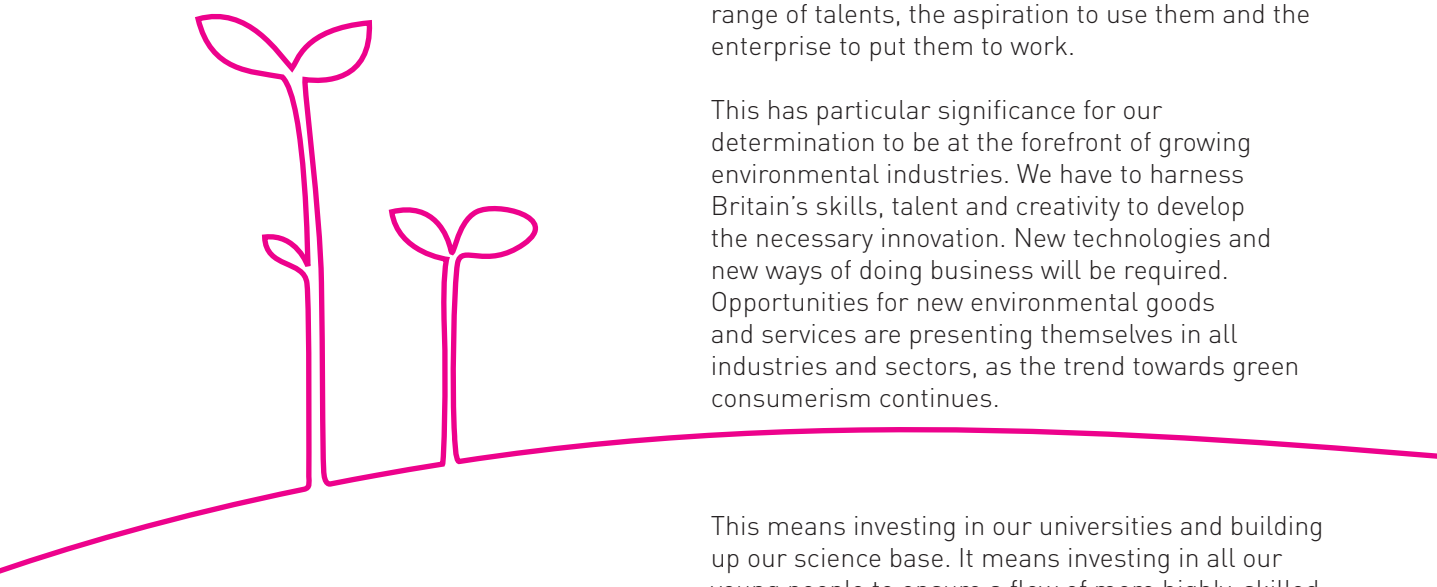
Lontra was accepted into the Carbon Trust incubator programme in 2006. The support received helped the company to raise initial finance, recruit a new Board, begin negotiating commercial deals and provide a platform which is helping to secure further funding.



Simon Hombersley, Business Development Manager at Lontra, said:

"THE CARBON TRUST INCUBATOR PROGRAMME HAS TURNED US FROM A TECHNOLOGY PROJECT INTO A COMMERCIAL COMPANY, AND WE'RE NOW SECURING FIRST DEVELOPMENT DEALS WITH COMMERCIAL PARTNERS. THE PROGRAMME HAS HELPED US DEVELOP THE STRENGTH OF THE COMPANY IN A WAY THAT CASH ALONE COULDN'T HAVE."

DEVELOPING THE NECESSARY SKILLS



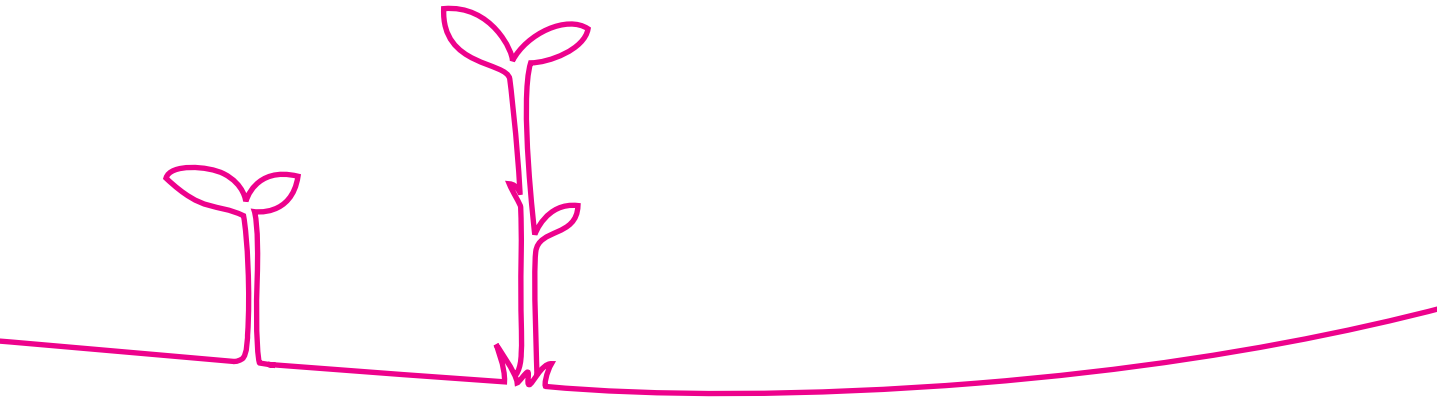
The Government has set the ambition, in the wake of the Leitch Review, of making our nation a world leader in skills. It is a blunt recognition that, in the face of intensifying global competition and rapid technological change, we need to keep pace in the race for skills. The jobs of today will not be the jobs of tomorrow, and we need to ensure the nation is equipped to respond to emerging strategic challenges such as globalisation and climate change which will affect everyone. The future prosperity of Britain depends on our ability to unlock a wide range of talents, the aspiration to use them and the enterprise to put them to work.

This has particular significance for our determination to be at the forefront of growing environmental industries. We have to harness Britain's skills, talent and creativity to develop the necessary innovation. New technologies and new ways of doing business will be required. Opportunities for new environmental goods and services are presenting themselves in all industries and sectors, as the trend towards green consumerism continues.

This means investing in our universities and building up our science base. It means investing in all our young people to ensure a flow of more highly-skilled young people into the workforce. That is why the Government is raising the school-leaving age to 18 with a new emphasis, for those best suited, on vocational training. It is why the Apprenticeship Programme continues to be expanded. But this will not be enough. Over 70% of our 2020 workforce has already completed their compulsory education, so we need to continue to invest in adult education and training, driving forward reform to ensure we deliver the skills that individuals, businesses and the economy need.

A network of National Skills Academies are now being set up in a number of key sectors to help us achieve the Government's ambition of world-class skills. These are putting employers in the driving seat, building strong specialist provider networks and transforming the supply of skills to their sectors. Working closely with SSCs, Academies provide high-quality training to increase productivity and to encourage innovation.

THE FUTURE PROSPERITY OF BRITAIN DEPENDS ON OUR ABILITY TO UNLOCK A WIDE RANGE OF TALENTS, THE ASPIRATION TO USE THEM AND THE ENTERPRISE TO PUT THEM TO WORK.



As with all the National Skills Academies, the National Skills Academy for Environmental Industries will be developed through a competitive process, in partnership with the industry itself to ensure it is producing the people and skills that the sector needs now and in the future.

The newly created UK Commission on Employment and Skills will play a central role in raising the UK's skills base, improving productivity and competitiveness, increasing employment and making a contribution to a fairer society. This includes ensuring that the skills implications of the transition to a sustainable and low-carbon economy are being effectively identified and addressed.

As well as skills, an entrepreneurial culture will be a critical element in responding to the new environmental business opportunities. So the Government is also taking steps to encourage entrepreneurship. The creation of a new National Enterprise Academy was announced by the Prime Minister in March, in partnership with Dragon's Den entrepreneur Peter Jones. It will aim to deliver accredited qualifications in enterprise, initially to the 16 to 19 age group, but with a broader remit of raising enterprise awareness across the entire population and age range, including more women entrepreneurs. The Government has also committed a further £30 million to extend enterprise education into our primary schools.

BUILDING PARTNERSHIPS

In all these areas, Government has a critical role. But Britain's success in seizing the opportunities of a low carbon economy will ultimately depend on what businesses, individuals and communities do. The Government is therefore committed to working in partnership with business and trade associations, with local and regional bodies, with higher and further education institutions, and with the third sector on this challenge.

We have already seen at both a national and local level a growing recognition of the scale of the change that will be needed.

The CBI's Climate Change Taskforce study and the recent report from the EEF are just two examples of how seriously business is taking the environmental challenges we face. There has been a transformation in the priority given to climate change and sustainability by companies, big and small, in every sector. This change of attitude is almost certainly now permanent. Business has recognised that operating in a more sustainable way is good for them, good for the planet and is also what their customers want. At the same time, trade unions are also recognising the potential for job creation, and workplace training and involvement, from this field. And across the country, innovative local initiatives to tackle climate change and reduce environmental impacts are springing up. The Government wants to encourage such initiatives and learn from them so that best practice can be shared widely.

Through the Carbon Trust, WRAP, NISP, Envirowise and RDAs, the Government has established a network of advice and support for businesses to look at their environmental impacts, from the design stage, the use of recycled materials, energy and water saving and pollution reduction. The Carbon Trust alone visited over 5,000 business and public sector customers in 2006/7 to provide tailored energy saving advice, and answered over 35,000 calls to their dedicated advice line.

In June 2008 the Government will host a two-day Low Carbon Economy event to take forward the partnership approach. The first day will be hosted by UK Trade & Investment (UKTI) to highlight the business to business opportunities presented by the increasing demand for low carbon and sustainable solutions, with a focus on the environmental technologies sector. The second day, 26 June, will be the UK Low Carbon Economy Summit 'Business Opportunities in a Low Carbon Future', hosted by BERR and the Royal Bank of Scotland. This Summit will provide a forum for senior business representatives to debate what further measures Government and business will need to take, and how they can work collaboratively, to make the most of the opportunities of moving to a low-carbon economy.

The Government is also working to revise its Manufacturing Strategy during 2008, one important element will be to establish and support areas where the UK is able to compete in the production of low carbon and resource efficient products, and better enable businesses to make the most of existing and new opportunities in the green economy.

Conclusion

Building a low carbon economy will be a challenge but also an opportunity. The prize will be measured most importantly in avoiding the worst consequences of climate change, but also in jobs, economic growth and the opportunity to help unlock the talent of our nation. But we must not underestimate the scale of the task ahead.

To meet this challenge, CEMEP called on government and business to make the UK one of the best locations in the world to develop and introduce low-carbon and resource-efficient products, processes, services and business models. Government is determined our country will meet this challenge, and will work with all partners to ensure we do.

Regional partnerships for eco-innovation: Envirolink Northwest

The Northwest Waste Technology Virtual Centre of Excellence is an Envirolink Northwest project funded by the North West Regional Development Agency (NWDA), Defra and many local authorities from across the Northwest region. It aims to enhance the profitability and competitiveness of companies in the Recycling and Waste Management sub-sector of the environmental technologies and services sector whilst supporting environmental improvements in the region (in particular diversion of waste from landfill into recycling).

A few examples of the projects supported by the Centre include:

1. The University of Manchester 'polymers group' co-operated with a local plastic processing company to develop a technology that enables the separation of contaminants from Waste Electrical and Electronic Equipment (WEEE) plastics. The machine is now in the prototype stage and is expected to be fully operational shortly. The result is that more contaminated plastic can be recycled with a marked improvement in the quality of the product.

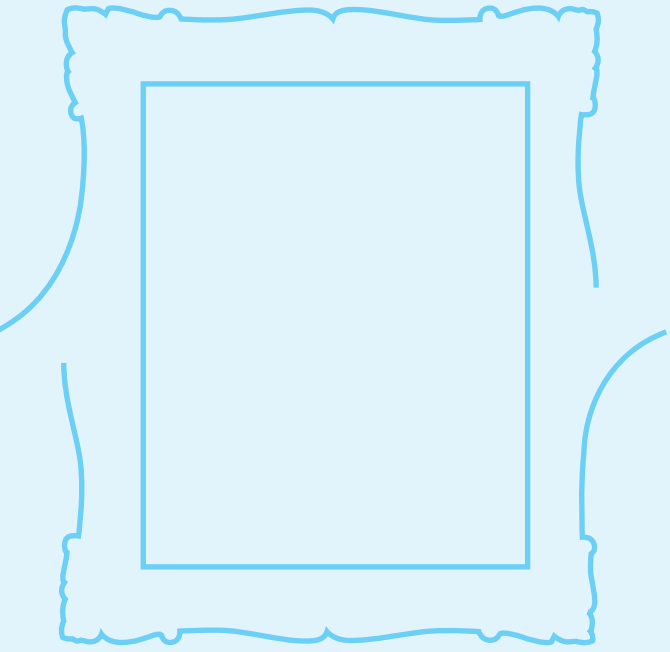
2. Manchester Metropolitan University was commissioned by the Centre to investigate and develop, on behalf of a company, a two-stage fluidised bed reactor to enhance the production of ethanol and biogas from organic waste. The results are promising and will be used to build a prototype for further R&D work.

3. Liverpool John Moores University is working with a NW company to develop microwave technology for manufacturing biodiesel from waste oil and fat. Initial trials showed that the University's approach is working well in reducing the time for the manufacture from hours to few minutes, reducing resource usage and increasing purity of the product. The success of the project would enhance biodiesel production substantially and give local companies a competitive edge.

PART 2

DETAILED GOVERNMENT RESPONSE TO CEMEP'S RECOMMENDATIONS

THE LONG-TERM FRAMEWORK



A key principle of CEMEP was that Government should create a 'long, loud and legal' environmental policy framework: one that is clear, credible and unambiguous and applies over a long enough timescale for investment decisions. As set out in this section, a number of recommendations relate to this theme, focusing on how Government policy should provide the right conditions to drive UK investment in environmental markets.

RECOMMENDATION 1: Government should set credible, long-term environmental goals, consistent with business investment cycles. One means of achieving this is through building national consensus by opening decision making to wider society. 'Credible' and 'consensus' need not mean unambitious.

Where a pressing environmental case can be made, goals should be set in areas other than climate change, such as products and materials. The newly established Products and Materials Unit within the Department for Environment, Food and Rural Affairs (Defra) should facilitate this.

The Government agrees with the emphasis placed by CEMEP on the importance of setting clear, credible long-term environmental goals consistent with business investment decisions, and of building consensus through open consultation with stakeholders.

The Climate Change Bill will provide a long-term, credible, domestic framework for reducing CO_2 emissions and adapting to climate change. It will introduce legally binding medium- and long-term CO_2 reduction targets (by at least 60% by 2050 and by at least 26% by 2020 against a 1990 baseline) and will introduce a new system of five-year carbon budgeting, to be set three periods ahead, to increase confidence and certainty for business planning and investment.

Another example is the timetable to the 'zero carbon' new homes target in 2016, with two interim steps along the way: in 2010, there will be a 25% improvement in energy/carbon performance in building regulations, and a 44% improvement in 2013. The Chancellor announced, as part of his 2008 Budget speech, the Government's ambition that all new non-domestic buildings will be zero carbon from 2019. We will be consulting this year on this ambition and how it can be achieved. It was also

announced that we will review progress against this ambition in 2013; and that Government will lead by example, with the ambition that all new public sector buildings will be zero carbon from 2018. The Government will establish a taskforce to advise on the timeline, how to reduce carbon emissions in the intervening period, and the particular challenges faced in some sectors such as hospitals, prisons and defence establishments. As part of the Government's ongoing investment programme for renewal and modernisation of the Further Education estate, the Government has set a target of all new college buildings to be zero carbon by 2016 and has a taskforce in place to advise on how we may be able to move even more quickly to this position.

In addition, the *Waste Strategy for England 2007* sets out the Government's policy framework and includes ambitious targets for waste up to 2020 and a range of measures to achieve them.

As noted in the CEMEP Report, a Product and Materials Unit has been established in Defra, with the aim of identifying and catalysing action across the supply chain. By taking a product-focused approach, Government aims to present environmental goals (including climate change goals as well as goals on natural resources and the natural environment) in a more business-focused way. Among other things, we are looking at how the idea of 'product roadmaps' can be applied in 10 areas as a way to: help create better understanding of the environmental and social impacts of particular products; describe a vision for a product that is more sustainable; engage stakeholders; and set out a course of action to achieve that vision. We will be publishing a progress report on our products and materials work later in the year.

These activities demonstrate that our approach to environmental policy is becoming smarter, more ambitious and innovative. In the future, we will seek, where appropriate, to apply CEMEP's principles of environmental goal setting.

RECOMMENDATION 2: Government, working with EU partners as necessary, should urgently consider options to reduce the uncertainty in carbon prices under the EU Emissions Trading Scheme, or at least its impact on business, and so increase the incentives to invest and innovate to cut carbon emissions.

The Government agrees with the emphasis placed by CEMEP on ensuring greater predictability for investors on future carbon constraints and therefore welcomes the European Commission's proposals to amend the EU Emissions Trading Directive, which it published as part of its Climate and Energy package on 23 January 2008. The Commission proposes a stringent, centrally set EU-wide cap for the period from 2013 and a clear, long-term reduction trajectory. This is the type of market signal that the UK Government and industry have been calling for. We believe the Commission proposals provide an excellent starting point for Member States to negotiate improvements. We also agree with CEMEP's comments on the importance of setting stringent caps for future phases; on the need to improve the efficiency of the scheme; and on transparent and predictable rules for the release of market-sensitive information.

RECOMMENDATION 3: Government should explore the scope for making greater use of progressively updated or 'dynamic' performance standards to drive improvements in the resource efficiency of products, particularly at the EU level.

The Government accepts the CEMEP principle of setting 'dynamic' performance standards that are flexible enough to change as technology develops, therefore avoiding locking in outdated standards or old technologies, while noting that this must be achieved through careful consultation and assessment of costs, benefits and impacts.

We take the approach that, by signalling to and engaging with industry, we can encourage companies to adapt their products during normal development cycles without the need for costly interventions. Following the voluntary initiative from retailers and energy suppliers to phase out inefficient domestic light bulbs by 2011, we are exploring the scope for similar initiatives to promote energy-efficient products on UK markets within a number of sectors. In particular, in December 2007, we published a series of consultation papers setting out our analysis of how the performance of various energy-using products will need to improve over the next 10–20 years, including commercial and domestic lighting, refrigeration, air conditioning, heating, and information and communications technology. The papers included proposals for

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standards and targets to phase out the least efficient of these products. Revised indicative performance standards for the consumer electronics sector were published in December 2007 following a consultation in summer that raised interesting issues over the frequency of review for dynamic standards. The feedback received from the consultations will inform the Government's views in relation to policies such as implementing measures being brought forward under the EU Eco-Design for Energy-Using Products (EuP) Framework Directive, the review of the EU's energy labelling directive, procurement policy, and on the need for further analysis.

The UK has also called on the EU to: clarify its priorities, targets and future plans for energy efficiency standards in products – looking ahead at least 10 years; urgently accelerate the delivery of mandatory, cost-effective energy efficiency; set standards for priority products through the EuP Directive; and allow the introduction of a reduced VAT rate for the most energy-efficient products. We have prioritised energy-using products as this is where fast, cost-effective carbon savings can be made. We are also keen to consider, with partners in the EU and domestically, how far the existing frameworks can be applied in areas other than energy to improve the broader resource efficiency of products. We would look to do so where there is clear evidence of the benefits of adopting such an approach and in a manner consistent with better regulation principles.

RECOMMENDATION 4: Government should ensure that it sets out and adheres to well-defined timetables for the implementation of environmental legislation. Examples of where this would be relevant are the implementation of the EuP Directive and the proposals in England's waste strategy 2007 to consider landfill bans for certain materials (should these be taken forward).

The Government fully accepts this recommendation. We recognise that, in some cases in the past, implementation did not go as smoothly as it might have and we will endeavour to improve on this in the future. All Departments are expected to plan implementation, publish timetables for stakeholders at the beginning of policy development, consult on options, and prepare guidance 12 weeks in advance of the legislation coming into force. Last year's revised guidance on the transposition of EU legislation and the consultation on possible revisions to the Consultation Code of Practice will help facilitate this. Defra's own guidance on transposing environmental legislation stresses the importance of considering implementation as part of the negotiation process and, where possible, engaging with regulators from the outset. Moreover, transposing legislation in a managed and structured way (which reflects both Policy and Project Management and best practice as recommended by the Better Regulation Executive, Department for Business, Enterprise and Regulatory Reform (BERR)) will be included in new Defra guidance to be launched later in 2008.

The UK has already transposed the initial EuP Directive according to the EU's legislative timetable, following consultation with stakeholders. There are no new implementation measures as yet; these will only arise when the European Commission puts forward proposals and these are agreed. The Government has also already implemented the Landfill Directive bans on specified wastes in landfill sites; and the *Waste Strategy for England 2007* commits to considering further restrictions on placing biodegradable waste and recyclable materials in landfills. Any proposals for further restrictions to meet the Strategy's objectives will follow evidence-based analysis and be subject to consultation and a clear and realistic timetable for implementation.

RECOMMENDATION 5: Government should commission a study of how the long-term needs and opportunities from innovation can be incorporated into cost–benefit analysis guidance, with a view to assessing longer-term impacts on economic performance routinely in environmental policy appraisal.

We aim to design policy in a way that harnesses the potential of innovation to help meet our environmental goals – and the Government welcomes this recommendation. The Government's central guidance on social cost–benefit analysis is the *Green Book*, published by HM Treasury. The guidance makes it clear that wider social and environmental costs and benefits (for which no market price exists) need to be valued and included in social cost-benefit assessments. HM Treasury will consult with Defra, BERR, the Department for Innovation, Universities and Skills (DIUS) and other government Departments to provide supplementary Green Book guidance on valuing innovation in the context of environmental policy. The Green Book guidance applies to all central government spending proposals, policies programmes and projects and to Impact Assessments.

Government has replaced the previous Regulatory Impact Assessment with a simpler, more transparent process that is embedded in the earliest stage of policy making which uses Green Book analysis. The new Impact Assessment, used from 6 November 2007, is a key tool for making transparent modern regulation that is proportionate to the issue it is designed to tackle.

Finally, as noted in the DIUS Science and Innovation White Paper, *Innovation Nation*, the Government has concluded that it would be appropriate to draw together previous experience of the ways in which regulation can lead to more innovation in order to learn lessons and help frame future regulation. The White Paper proposed three specific actions:

- DIUS and the Better Regulation Executive in BERR will work with the Business Council for Britain and others to identify how regulation may promote or hinder innovation.
- DIUS and the Better Regulation Executive in BERR will use existing regulators' forums to share experience on how their activities could promote innovation.
- The Technology Strategy Board (TSB) will advise Government on the opportunities that may arise from the adoption of EU regulations to stimulate business innovation, including, where appropriate, building these into the design of TSB programmes.

RECOMMENDATION 23: Policies on the introduction of smart metering should create a clear and credible market requirement against which business can invest in the cost-effective deployment of technology. In the water sector, for example, a clear commitment to the introduction of flexible tariffs would achieve this.

As set out in its 2008 water strategy for England, *Future Water*, the Government recognises the benefits that smart meters may bring. In particular, smart meters may have the potential to provide companies with the ability to introduce more innovative tariffs to both help protect vulnerable customers and incentivise water-saving behaviours. Ofwat also sees benefits in smart metering. If water companies put in a business case for smart meters showing that the benefits outweigh the costs, Ofwat may allow funding for smart meters in companies' price limits. Indeed, Ofwat have allowed the funding of smart meters in the past. The Government and Ofwat are, however, mindful of the cost of smart meters.

We believe that it is important to ensure that the benefits of smart metering outweigh the costs and to uncover the incidence effects of different tariffs before looking at the metering technology that would facilitate the introduction of those tariffs.

The Government is commissioning an independent review of charging for water. This wide-ranging review will, among other things, consider the cost of metering, including smart metering, taking into account the full social cost of carbon, and the cost effectiveness of different charging options.

In respect of gas and electricity, the Government confirmed in the Budget 2008 that it would implement its policy of ensuring that advanced meters would be provided to 200,000 larger business electricity and gas customers over a five year period. On smart metering as a whole, on 22 April, the Government published amendments to the Energy Bill designed to provide a power for the introduction of smart meters in the event of a Government decision on a roll-out of such meters. On 23 April, the Government published its consultation Impact Assessment, which it will continue to refine over

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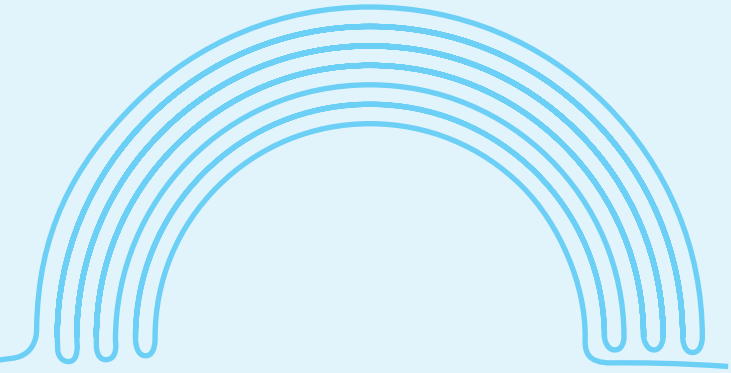
the coming months. The size and cost of a smart metering programme means that the most thorough consideration needs to be given to all of the issues surrounding a roll-out before a final decision is made. The Government intends to take decisions on the way forward in the light of additional analysis now being undertaken, as well as interim results from the Energy Demand Research project, which will be available in November 2008.

CREATING THE CONDITIONS FOR INNOVATION



Achieving CEMEP's challenge of making the UK one of the best locations in the world to develop and introduce low-carbon and resource-efficient products, processes, services and business models will require effective support for the development and commercialisation of environmental innovations. A number of CEMEP's recommendations, as set out in this section, challenge Government to go further to support innovation, in particular by removing barriers and disincentives.

RECOMMENDATION 6: Government Departments' and regulatory agencies' science and innovation strategies should not focus only on the use of science to support policy, but should address their role in inducing and rewarding private sector innovation that furthers the Government's environmental objectives.

We accept this recommendation in principle. The Government Office for Science's guidance to Departmental Chief Scientific Advisers (CSAs) sets out mechanisms to promote innovation and encourage innovative pull from the wider economy when commissioning or disseminating research. It also indicates that consideration should be given to how support for innovation will be addressed through procurement policies. We will ensure that the guidance remains current and is clearly highlighted as good practice across the CSA community, though it is for individual Departments and regulatory bodies to determine their approach in this area, balancing their aims and priorities. In addition, the TSB will pursue opportunities for joint working and dialogue on innovation strategies, where appropriate, with government Departments, regulators and their CSAs.

The Science and Innovation White Paper also includes a commitment to innovative procurement for each government Department (see response to Recommendation 9) together with HM Treasury's report Transforming Government Procurement which highlights the important role that innovative procurement has to play in delivering high quality public services at good value for money. The Government will report on progress on innovation in the annual innovation report, the first of which will be published in autumn 2008. The report will be comprehensive covering UK innovation performance across both public and private sectors – highlighting strengths and weaknesses. It will also benchmark UK performance against that of key competitor countries.

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RECOMMENDATION 7: Government, business and the relevant bodies should review the product approvals regime in the construction sector to better understand the barriers to introducing innovative, sustainable products. Measures should be identified to overcome these barriers and, where appropriate, applied more widely.

It is important to provide clear information and guidance to business on product standards. DIUS has completed an initial information pilot of standards information on businesslink.gov [www.businesslink.gov.uk] – a unique resource to owners of new and established businesses in the UK that already presents users with a list of regulations, licences and registrations that apply to their business, personalised by business sector and location. This facility is being expanded to include standards-related material – including 27 sector-specific case studies and over 800 'at a glance' guides to the most popular standards (as identified by trade associations). DIUS is currently evaluating the pilot and anticipates a fuller content launch in summer 2008.

The DIUS Innovation Delivery team is also working with the UK national standards body, the British Standards Institute, to research and fully explore the extent of standards available to support the wider sustainability agenda. A full gap analysis will be conducted and it is anticipated that results will help inform future policy.

In addition, the Construction Sector Unit in BERR will work with industry to gain a better understanding of the barriers to introducing innovative and sustainable products. In light of that, and working with DIUS, it will consider the role the product approvals regime can play in encouraging the introduction of such products, review whether there is scope for improvement, and take account of this work in future policy.

RECOMMENDATION 8: Government should review the duties of the economic regulators in the energy and water sectors to give greater prominence to the importance of environmental innovation in meeting sustainability goals, and back this up with guidance as to how a more complex set of duties might be interpreted.

The Government accepts the principle that regulators should look to encourage innovation where this contributes to the achievement of their sustainability objectives, while recognising that any environmental initiative needs to be cost proportionate. Both Ofwat and Ofgem have statutory duties to contribute to the achievement of sustainable development, and the Government will continue to work with them to develop their approaches.

Ofwat provides incentives to companies to innovate via both comparative competition and financial incentives to reward performance for a rolling five-year period. As part of the current price review in December 2007 and at Ofwat's request, each water company has set out its strategic direction for the next 25 years in public for the first time. These strategic direction statements outline how each company will address climate change and other sustainability goals. They will provide a longer-term context for price limits to be set by Ofwat in 2009. Ofwat is also taking action to encourage innovation that delivers better value for consumers through increasing the role of competition wherever possible, and at the same time creating a regulatory framework that rewards companies to deliver best value for consumers.

Building on this progress to date, in February 2008 the Government issued draft statutory social and environmental guidance for consultation. The document sets out the wider social and environmental policies that Ofwat should consider contributing to and includes an expectation that Ofwat will encourage greater innovation in the water industry. In addition, the Government has commissioned Professor Martin Cave to carry out an independent review of competition and innovation in the water industry. This wide-ranging view will, among other things, consider how best to foster increased levels of innovation in water and sewerage services. The review commenced in March 2008 and will report within a year.

Ofgem uses incentive schemes such as the Innovation Funding Incentive and Registered Power Zones to encourage distribution network operators to apply technical innovation in the way they pursue investment in, and operation of, their networks. Like Ofwat, Ofgem is also required to take account of statutory guidance on social and environmental matters. The Government intends to publish draft new guidance in the spring of 2008 to reflect the changes in the wider context and the Government's high-level energy objectives, such as the EU 2020 goals for renewable energy and emissions and the 2007 Energy White Paper, *Meeting the Energy Challenge*, as well as the existing fuel-poverty targets. This guidance will also necessarily touch on the need for innovation if these targets are to be achieved.

Moreover, in addition to commitments highlighted in the Science and Innovation White Paper, DIUS Ministers have met with three of the economic regulators to discuss how innovation can best be incorporated into their approach to regulation. As noted under Recommendation 5, DIUS and BERR will now ask the independent regulators, using existing forums, to consider how their activities could promote innovation.

RECOMMENDATION 9: Government should facilitate the scaling-up and replication of the Forward Commitment Procurement (FCP) model in the public sector by:

- identifying where better, more cost-effective solutions are needed to achieve environmental policy objectives
- developing the public sector's capability to engage effectively with the market using FCP, including by establishing a 'challenge' scheme
- adopting the FCP model for the Zero-Waste Places initiative.

The Government acknowledges that use of the FCP model can help develop innovative cost-effective technologies to meet environmental needs. DIUS is leading on the use of procurement to encourage innovation and is working closely with Defra to develop Government's use of FCP.

The Science and Innovation White Paper *Innovation Nation* recognised that policy should combine the standard instruments of regulation or market-based incentives such as FCP with direct support for innovation. The White Paper highlights a DIUS commitment to take forward this approach and, in particular, committed to:

- each government Department including an Innovation Procurement Plan as part of its commercial strategy to outline how they will drive innovation through procurement and use innovative procurement practices
- working with the TSB, the Office of Government Commerce (OGC) and with Departments that have experience of promoting innovation through procurement to support others in using their procurement power effectively in support of innovation
- with the TSB, reforming the Small Business Research Initiative (SBRI) by refocusing it on technology-based research and piloting this new approach with the Ministry of Defence and the Department of Health. The revised SBRI will be extended to all participating Departments by April 2009.

FCP has been successfully demonstrated by HM Prison Service in procuring cost-effective zero-waste prison mattresses. Building on this approach, the Government is planning to use the FCP model to accelerate the market entry and uptake of ultra-energy-efficient lighting. Opportunities in transport, healthcare and general commercial lighting applications have already been explored in government Departments, local authorities and health trusts, with a view to undertaking a market engagement exercise in 2008.

A new Centre of Expertise for Sustainable Procurement (CESP) is to be established to help Departments achieve their targets for reducing carbon emissions and waste across the government estate. The CESP will be set up within the OGC and will help identify where better solutions are needed to achieve environmental policy objectives, improve accountability for delivering these objectives and help improve capability and to develop new and innovative ways for sustainable working, planning and procurement within the Civil Service.

Defra is now working with the Business Resource Efficiency and Waste (BREW) Centre for Local Authorities to take forward the Zero-Waste Places initiative. The FCP model is an option that Defra is considering within the context of this initiative.

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In addition, Government recognises the importance of improving skills in procurement, as included in the responses to recommendations 17 and 24.

RECOMMENDATION 10: Government should establish 'environmental innovation zones', where local area partnerships are empowered to use a range of policy measures to bring forward innovative solutions to deliver unmet environmental goals. This should be seen as the first in a series of progressive steps to transforming market sectors and creating economic opportunities on a wider scale. Successful examples should be replicated and participants encouraged to collaborate, where appropriate, to create economies of scale.

The local and regional government landscape provides a framework within which eco-innovation activity can be nurtured in accordance with local and regional priorities. The Government encourages regional and local authorities to identify opportunities for environmental innovation and to think through how these can be reflected in the development of regional economic and spatial strategies and local development frameworks.

The Government has recently published technical definitions for the 198 performance indicators in the new Local Government Performance Framework. These include a number that deal with climate change and protection of the environment, and their inclusion in performance monitoring will stimulate local areas to take action to tackle climate change and other environmental problems. A significant number of local authorities have expressed interest in including a climate change indicator.

Existing Local Strategic Partnerships bring different parts of the public sector together with private, business, community and voluntary sectors so that different initiatives and services support each other and work together. Through these partnerships, local authorities are required to produce a sustainable community strategy that embodies a long-term vision for the economic, social and environmental well-being of that local area. This long-term vision provides steer for Local Area Agreements (LAAs), which will now provide local authorities and partners with the flexibility and capacity to deliver the best solutions for their areas through a reformed relationship between central and local government. Groups of local authorities may also work together through multi-area agreements to achieve outcomes across wider than local area boundaries.

In addition, Regional Development Agencies (RDAs) play a leading role in strengthening the innovation infrastructure within their regions, developing strategies and bringing together partnerships with local authorities and other national, regional, sub-regional and local organisations, to identify and address particular regional market challenges and opportunities – including environmental challenges and opportunities. This may include targeting the incubation of new environmental technologies businesses where it has been identified as a regional priority.

The Government has recently published a consultation document on taking forward the Review of Sub-National Economic Development and Regeneration. This includes bringing together the Regional Economic Strategy and Regional Spatial Strategy into a single strategy, which will be a powerful tool for regions to identify and plan for opportunities to promote environmental innovation.

More than half of English local authorities have signed the Nottingham Declaration on climate change and are working with the UK Government to contribute, at a local level, to the delivery of the UK Climate Change Programme and to the achievement of the UK's emissions reduction targets. Some local authorities have already adopted targets to help guide the action that they are taking and many more are considering them under the current round of LAA negotiations. Others have benefited from support from the Carbon Trust's Local Authority Carbon Management Programme, which requires them to set targets and to adopt a strategy for reducing emissions under the control of the local authority such as buildings, vehicle fleets, street lighting and landfill sites. Salix Finance also provides support for

energy-efficiency projects and facilitates the sharing of best practice among public bodies.

Moreover, the Department for Communities and Local Government and Defra, working with the Core Cities Group, launched a joint declaration at the Core Cities Summit in November 2007, setting out how we will work with the core cities to develop the type of leadership and innovation that is needed to meet the challenges posed by climate change in our major cities. This work includes a Low-Carbon Cities Programme, which will pilot a new approach towards carbon management at the city level and develop learning that will be of assistance to all cities in supporting their new climate change functions as a response to the new local government performance framework.

The Government published Eco-towns – Living a Greener Future on 3 April. This is a three month consultation on preliminary views on eco-town benefits and the shortlisted locations. The consultation document builds on the *Eco-towns Prospectus* and provides further approaches on the seven key criteria for an eco-town, including the environment and carbon criterion, and the need for intensive application of environmental technologies, resource efficiency and environmental design. It also includes details of the planning process for eco-towns.

Finally, Government recognises that different organisations often need to work together to address issues of innovation. The Science and Innovation White Paper announced plans for New Partnerships for Innovation, covering activities from science-based technological innovation to non-technological innovation, as well as innovation in the public and third sectors. The partnerships will embrace this wide definition – supporting collaboration at appropriate scales that bring together public, private and third sector organisations to develop innovative solutions to challenges, whether economic, social, environmental; local, regional or national, or a combination of these. We will work with partners over the next few months to develop a detailed prospectus to be published in autumn 2008.

RECOMMENDATION 11: To improve the development and uptake of renewable and low-carbon energy technologies in the UK, Government should use targeted sectoral deployment support measures more widely, with careful attention to the choice of instrument for different stages of technology maturity.

The Government supports CEMEP's recommendation on targeted sectoral deployment measures for the uptake of renewable and low-carbon energy technologies. The Government's policy on support for research, development and demonstration (RD&D) and for the deployment of energy is set out in the Energy White Paper and will be further supplemented by a strategy for the delivery and operation of the UK Environmental Transformation Fund (UK ETF) to be published in summer 2008. We recognise that new low-carbon energy technologies need support to ensure that new products and processes make it to market.

In addition, the Government will be launching a consultation over the summer on how the UK can best meet its share of the EU target of 20% of EU energy consumption to come from renewable sources by 2020. This will involve consideration of a range of measures to further increase support for renewable technologies across the electricity, heat and transport sectors. A full renewable energy strategy will be published in spring 2009 once the EU directive implementing the target has been agreed.

Government is also reviewing its Manufacturing Strategy during 2008. The intention is for the revised strategy to include, among other things, a low-carbon work stream that will seek to establish areas where the UK is able to compete in the production of low-carbon or resource-efficient products and what role the Government should take to enable business to make the most of existing and new opportunities.

RECOMMENDATION 12: To leverage best overall value for money from the funds available, existing capabilities and new initiatives in RD&D across the public sector and industry should be co-ordinated. Synergies should be sought between different strands of innovation support, including linking RD&D support to procurement opportunities.

CREATING THE CONDITIONS FOR INNOVATION

The Government believes that value for money is best achieved through a co-ordinated and consistent set of policies. This will also give more stable and coherent signals to the private sector and increase the value added from both public and private sector R&D.

Following the recent Comprehensive Spending Review (CSR) settlement, the TSB, in partnership with the Research Councils and RDAs, will develop and lead a strategic programme worth £1 billion to support technology and innovation activities for the benefit of UK business. The TSB's Innovation Platforms bring together government Departments, business and academia to address a major societal challenge and to open up market opportunities to increase business investment in R&D and innovation. In the case of each Innovation Platform, the TSB will work with public and private sector stakeholders and the government Department that 'owns' the challenge to identify the levers to produce the desired response – in terms of the scale of the procurement opportunity, the speed and rigour of regulation or fiscal measures, and the value of any up-front investment – and then support the most innovative products and service ideas and bring them successfully to market.

The next stage of the TSB's Low-Carbon Vehicles Innovation Platform, announced in the 2008 Budget, is the Low-Carbon Vehicles Integrated Delivery Programme. With an initial investment of £40 million jointly supported by the TSB, the Department for Transport and the Engineering and Physical Sciences Research Council, it will provide greater co-ordination of activities from university research to future potential procurement opportunities, speeding up the time it takes to get low-carbon vehicle technologies into the market place. Complementary funding to enhance the scope of the demonstration activity is under discussion with RDAs and devolved administrations. Advantage West Midland's Board has identified the potential for up to £30 million of investment in this initiative, subject to the demonstration of regional economic benefits.

The Energy Technologies Institute (ETI) is a 50:50 public:private partnership, established as a limited liability partnership in December 2007. It has a target to secure 11 private sector partners, each contributing £5 million per year for 10 years, with the UK Government matching these investments to create a potential £1.1 billion investment fund for low carbon energy technologies and solutions. The current industrial partners are BP, Caterpillar, EDF Energy, E.ON UK, Rolls-Royce and Shell. ETI's unique feature is its ability to fund projects directly with no requirement for further private sector support and secondly the opportunity for research and technology groups to access the skills, capabilities and market access routes of the private sector Partners.

The UK ETF will also provide at least £400 million of support for demonstration and deployment activities for low-carbon energy and energy-efficiency technologies over the next three years. The fund (which opened in April 2008) brings a new level of coherence to the Government's investment in low-carbon technologies, working closely with the new ETI, the Carbon Trust, the TSB and other relevant publicly funded initiatives.

The Government is committed to accelerating the development of carbon capture and storage (CCS) technologies. In November 2007 a competition was launched for one of the world's first commercial-scale demonstrations of CCS on a coal-fired power station. The 2008 Budget included further funding for Clean Fossil Fuel technologies under the UK ETF.

RECOMMENDATION 13: An 'options approach' should be taken to RD&D support, whereby:

- a diverse portfolio of emerging technologies is supported as consistently as possible beyond early stage R&D and through the development lifecycle; but
- progress is reviewed at the end of each development stage, and support withdrawn for underperforming technologies.

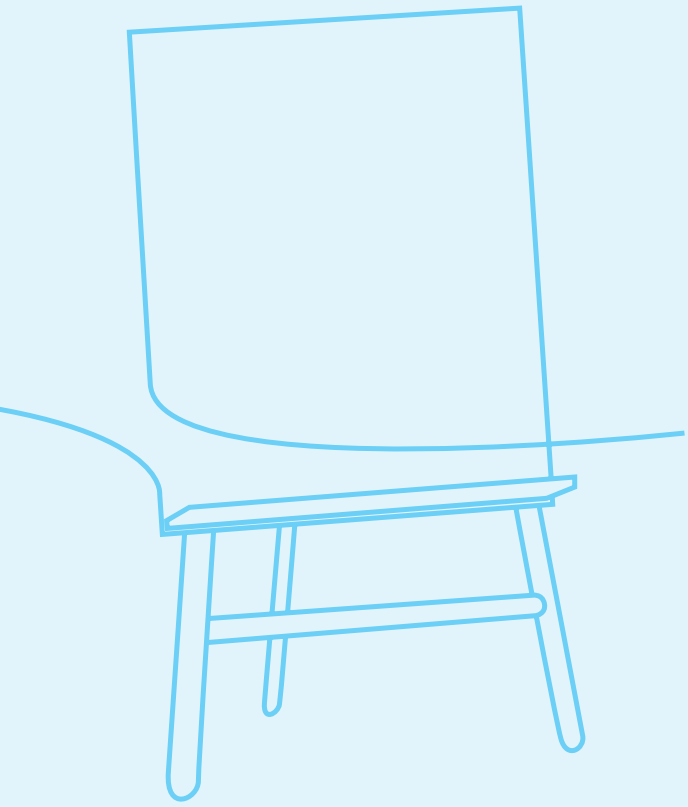
RECOMMENDATION 14: Government should develop a strategic capability to prioritise its RD&D support for innovation in environmental markets, using transparent criteria to target those technologies with the greatest environmental and economic benefits.

It is the Government's role to set an overall framework to guide RD&D policy. We agree that a portfolio approach should be taken to encourage a broad range of technologies, where these decisions are informed by assessments of benefit, UK capability and impact and include an exit strategy for underperforming technologies. But it is important to recognise that the issues around successful innovation are complex and there can be no certainty that sectoral measures, however well targeted, will necessarily result in commercial success at the deployment stage.

The Government considers that a credible and stable strategy is the best way to prioritise support for emerging technologies and, as mentioned in the response to Recommendation 11, plans to strengthen its strategic capability through the development of the UK ETF strategy, which will take into account the recommendations of CEMEP and others. This will be part of a cycle of ongoing work to keep all low-carbon energy technologies under review and ensure that Government continues to review, and, where necessary, reprioritise, its support for innovation. The Carbon Trust's Innovations programme will form part of this wider strategy on low-carbon technology innovation. In addition, the Office of Climate Change has recently undertaken a project to assess the circumstances under which Government should use technology policy (in both the national and international context) to accelerate innovation, and this will draw on CEMEP's analysis.

For environmental markets more broadly, the TSB's Key Technology and Application Areas provide the framework for deciding where the public sector should invest funding and support activities. The identification of these areas has been guided by clear and transparent criteria, and individual projects are assessed on the basis of achievable and cost-effective carbon savings, prospects for commercialisation and UK supply chain benefit. The broader *Low-Carbon Transport Innovation Strategy*, published in 2007 and part of which is the Low-Carbon Vehicles Innovation Platform, recognises the case for an 'options approach'.

DEVELOPING THE NECESSARY SKILLS



Our workforce needs the right skills if we are to host the new environmental industries of the future. With several sectors already reporting skills shortfalls, Government must provide the conditions to develop the talent and creativity of the British people, and is working to address this across the piece.

RECOMMENDATION 17: Government and industry should work together to improve the provision of training and professional development for supply chain management and public and private procurement professionals, to enable them to better manage the environmental implications of their supply chains.

The Government accepts the importance of public sector procurement practice incorporating environmental and sustainability considerations into its core processes. The OGC Government Procurement Service (GPS) is, on behalf of central government, leading on the promotion and embedding of the integration of sustainability considerations into existing and new learning and development provision.

The GPS *Skills Framework for Procurement Practitioners*, published for central government Departments in September 2007, includes sustainable procurement within corporate social responsibility to make this an explicitly required skill area. GPS is engaged with the Chartered Institute for Purchasing and Supply (CIPS) – the professional institute for all procurement professionals in the private and public sectors – to ensure that any commissioned bespoke learning and development interventions and CIPS qualification modules for Public Sector Faculty members, include content on sustainable procurement. CIPS regularly reviews the syllabus of all its qualifications modules and GPS intends to continue this engagement to ensure the integration of sustainability issues.

GPS and the National School of Government jointly administer the Certificate of Competence in Purchasing and Supply, a qualification course designed to meet the specific needs of new entrants to the procurement profession within central Government, which is accredited by CIPS. A review of the qualification was completed in February 2008, and environmental and sustainability issues are to be incorporated into any subsequent refresh of its content.

The CEMEP recommendation has also been considered by the cross-Government GPS Skills and Capability Steering Group (SCSG), as it identifies procurement skills gaps in Departments and commissions learning and development provision to fill them. The SCSG learning and development priorities for the procurement profession include sustainable procurement as an 'essential' area of provision. GPS is therefore working with OGCbuying.solutions (OGCb.s) to incorporate sustainable procurement into the specification for the Government-wide training and development framework agreement that OGCb.s will implement in 2008.

DIUS will work with the Confederation of British Industry to facilitate the interchange of innovation expertise between the private sector and government Departments, for example, through secondments and mentoring in innovative procurement and the design of services, products and processes.

RECOMMENDATION 20: To better understand where employment opportunities and skills needs are emerging in environmental markets, all stakeholders have a responsibility and a role to play. Government should map the various forums where these issues are already under discussion to help identify whether existing bodies are sufficient to take the agenda forward.

Following the Energy White Paper request to Sector Skills Councils (SSCs) to report on skills gaps in the energy sector, Government should invite the proposed Commission for Employment and Skills to review with SSCs the implications for employment and skills of the move to a sustainable, low-carbon and resource-efficient economy, and to make recommendations to Government.

In July 2007, the Government published *World-Class Skills*, which sets out the actions Government will take to reach its ambition of becoming a world leader on skills by 2020, benchmarked against the top-quartile countries of the Organisation for Economic Co-operation and Development. The document set out the Government's commitment to putting the skills implications of the transition to a sustainable, low-carbon and resource-efficient economy at the heart of this new ambition.

We agree with CEMEP that both the new UK Commission for Employment and Skills (CES) and the SSCs have a role to play in ensuring that those skills issues are addressed through sustained, ongoing activity.

In delivering its remit, the UK CES will play a role in ensuring that the skills implications of the transition to a sustainable and low-carbon economy are being effectively identified and addressed. The UK CES became operational on 1 April 2008.

The Sector Skills Councils also have an important role to play in assessing the skills implications for their sector of moving to a sustainable and low-carbon economy and in identifying how they can work with employers in their sector to address them. This will be especially important for some sectors, where environmental concerns are particularly prominent, including the energy, construction and land-based industries. The Government is also working with employers and Sector Skills Councils to bring forward plans for a National Skills Academy for Environmental Industries, to develop high-quality training and embed best practice and innovation in the provider network. As with all the National Skills Academies, the National Skills Academy for Environmental Industries will be developed through a competitive process, in partnership with the industry itself to ensure it is producing the people and skills that the sector needs now and in the future.

All SSCs will reflect their assessment of the implications of sustainable development for their sector in their Sector Skills Agreements and Sector Qualifications Strategies and through ongoing discussion with their sector partners.

RECOMMENDATION 24 (final part of recommendation): ...Government should also put in place capacity-building measures, such as training at the National School of Government, to increase awareness among officials of the links between environment, competitiveness and innovation.

Innovation in public services will be essential to the UK's ability to meet the economic and social challenges of the 21st century. The Government is uniquely placed to drive innovation in public services through the allocation of resources and structuring of incentives. Major forces such as attitudes to risk,

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budgeting, audit, performance measurement and recruitment must be aligned to support innovation. To help ensure that the UK's public services are the most innovative in the world, the National School of Government's Sunningdale Institute will work with partners to create a Whitehall Innovation Hub, a new partnership of organisations to capture and disseminate learning about public sector innovation.

The Sustainable Development Commission, the Government's expert adviser and sustainable development watchdog, is working to help develop Government's capability to meet the aims of the UK's sustainable development strategy, *Securing the Future*, which include the transition to a low-carbon economy. This involves working in partnership with the National School of Government and Government Skills – the SSC for Government – to develop appropriate learning opportunities for officials and to ensure that the ability to take a sustainable development approach is signalled as being important in the Civil Service.

The National School of Government has been working with Defra, the Sustainable Development Commission and Government Skills (the Sector Skills Council for Central Government) to develop a 'whole supply chain' and 'market development' approach to sustainable development in Government. One of the issues emerging in this analysis is that the Professional Skills for Government framework is, in effect, a procurement framework and influences which skills and capabilities civil servants see as being important for their career development. Sustainability will become embedded as a strategic theme in this framework during 2008 and it is hoped that this will create a stronger demand for training and development programmes with a basis in sustainability. Work is also being done to invite training and capability-building suppliers to help develop innovative approaches to skilling and developing public officials in sustainability, and a specially commissioned enquiry is underway to get a clearer sense of capability needs across and within Departments.

The National School of Government is also rolling out a portfolio of new and innovative 'green' learning products and changes to existing curriculums across a range of subjects, which will place greater emphasis on sustainability, with a particular focus on the transition to a low-carbon economy. The portfolio includes programmes covering energy performance, business cases, procurement, cross-Government working skills (supported by systems thinking that works against different parts of Government pursuing mutually incompatible policies, such as growth at the expense of the environment), public engagement, impact assessment, performance reporting and 'greening' personal development. On current thinking, the National School of Government considers that there are two key strands of capability to be built, one around adaptation, social resilience and business continuity and the other around creating new models of prosperity. The National School intends that its programmes will reflect both of these.

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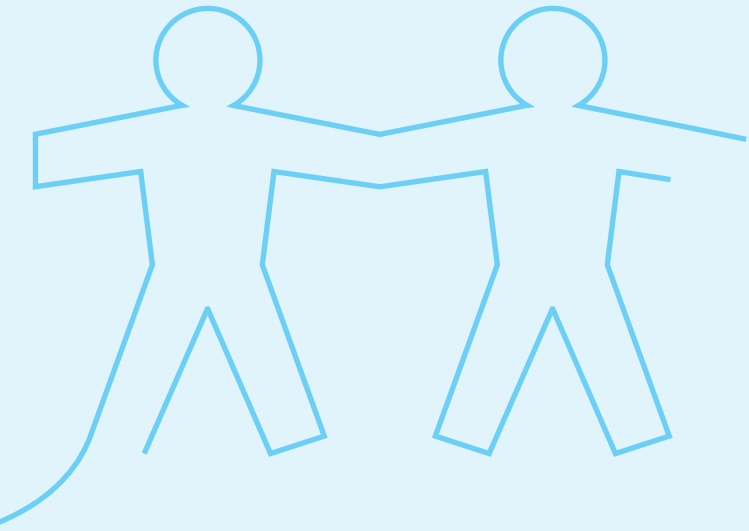

Building a low carbon economy will require an enduring partnership between Government, business, trade unions, education institutions and others. The opportunities for all are considerable if we get this right, but we have to be willing to work together, to learn from best practice, and to innovate in our ways of working.

RECOMMENDATION 15: To create market opportunities by improving the eco-efficiency of their operational performance and developing environmentally improved products and services, business should:

- address the whole lifecycle of products, to enable all environmental impacts, from 'cradle to grave', to be identified and reduced
- investigate the scope for 'cradle to cradle' or closed-loop production, where recycled materials become the feedstock for new products, spreading new practices through the supply chain
- assess how to re-engineer processes to cut costs while reducing pollution and resource consumption and avoiding environmental risk
- investigate the scope for redesigning or re-manufacturing goods, incorporating environmental factors from the beginning of the design process; and
- consider how to create higher profits while reducing resource (including energy) consumption by selling added value services rather than more products.

The Government welcomes the recommendations for business, as they are consistent with its own approach to working with the private sector and other stakeholders to help them move towards more sustainable production and consumption patterns. We look forward to working closely with business in helping to bring about the transition to a greener economy.

RECOMMENDATION 16: Government should consider the need for a longer-term, better-resourced system to advise business on resource efficiency, with more emphasis on upstream measures and dissemination. This should inform the Government's ongoing Business Support Simplification Programme (BSSP).

The Government agrees on the importance of providing a clearly signposted, user-friendly support

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service for business. The BSSP will ensure a long-term framework for doing so across a range of areas where proven market failures require Government intervention. This will improve the consistency of support and make best use of available resources. Work is progressing on the delivery landscape and its coherence, with an expectation of making significant progress by October 2009.

Defra's recent budget announcement provides continued funding for business resource efficiency measures in 2008/09. Work is now underway to provide indicative allocations for 2009/10 and 2010/11 as soon as possible, in order to enable longer-term planning. Future funding in this area will be overseen by Defra's two programmes on sustainable consumption and production and domestic climate change. We will look to embed in these wider programmes learning from the BREW Programme, which will end in March 2008.

Future funded activity will increasingly focus on providing evidence and information to the business community at large in order to maximise influence and catalyse action. Defra will, in discussion with delivery bodies, withdraw from funding environmental support to individual companies, where delivering benefits to the environment will also quickly deliver reduced costs and increased profits for those companies.

With the above changes in mind, we have established a review of Defra's delivery landscape for providing support to business, as well as consumers and the public sector, in the drive to a low-carbon, resource-efficient future. The review will look closely at the overarching principles in respect of public funding in this area and at the roles, responsibilities and relationships of the relevant delivery bodies to ensure that we can deliver coherent, effective and efficient support. We expect a final report from the review to be completed in time to input into business planning for 2009/10.

The Government also recognises the particular importance of assisting small/medium-sized enterprises to become more resource efficient, given the challenges in delivering to this sector. Lessons learned from RDA pilots on resource efficiency are being incorporated into the Promoting Resource Efficiency and Sustainable Waste Management Offer under the BSSP Portfolio.

The Government agrees with CEMEP on the importance of upstream measures. Addressing this is an important element of our waste strategy, our approach on products and materials, and in the thinking behind the Centre for Remanufacture and Reuse. Improving the effectiveness of support for business groups that want to work together to spread knowledge and best practice is an important element of BSSP.

RECOMMENDATION 18: Government, business, trade unions and other stakeholders should jointly develop, agree and adopt standardised protocols for measurement and reporting of carbon and other impacts, such as use of material resources and water. These should provide clear and simple, yet robust and credible information to allow business and consumers to behave in a more resource-efficient way and should be applied at intermediate stages as well as at the end of supply chains.

RECOMMENDATION 19: Government, along with business, should sponsor a study of how reliable an indicator the carbon footprint is for resource use and environmental consequences more broadly, and which aspects it fails to reflect.

In response to CEMEP's recommendation on the measurement and reporting of environmental impacts, Government will offer business and other stakeholders the opportunity to participate in a collaborative group to look at these issues, addressing in particular Defra's Key Performance Indicators, whether there is a need for any improvements and, if so, who would be best placed to deliver these.

Defra supports work by the Climate Disclosure Project and Climate Disclosure Standards Board to develop an international standard for entity-wide greenhouse gas emissions reporting. CEMEP members, and others, are encouraged to take part in this process. Defra also grant-funds the Energy

Saving Trust (EST) for its activities on carbon abatement in the household sector, which play an important role in helping the Government meet its climate change targets. As part of these activities, the EST accredits products under their Energy Saving Recommended label, signposting consumers to products that save the most energy and working with trade bodies and retailers.

Having methods that capture the environmental consequences of resource use and other environmental impacts, in addition to carbon-related impacts, is consistent with the Government's approach to Sustainable Consumption and Production. Defra has conducted studies on methods including ecological footprinting, lifecycle assessment and environmental input–output analysis to determine how these can effectively support policy and business to measure the environmental impacts of products and services. However, there is currently a market need to standardise the measurement of greenhouse gas emissions embodied in the lifecycle of goods and services across the supply chain. For this reason, Defra, the Carbon Trust and the BSI are developing a Publicly Available Specification (PAS2050) for this measurement. As a follow-on from this work, consideration will be given to the inclusion of additional impacts such as waste, resource depletion, and water use.

RECOMMENDATION 21: Trade unions should continue to press for companies to commit to and work for socially and environmentally responsible values. They should provide the necessary support frameworks for their members to lead and participate in workplace initiatives (such as training on resource efficiency) that will generate environmental improvements and increased employee loyalty and satisfaction.

The Government welcomes the recommendation for trade unions to continue to press for companies to commit to and work for socially and environmentally responsible values. Trade unions have a unique and valuable role to play in raising awareness and mobilising support for environmental improvements. We look forward to working closely with trade unions, including through the Trade Union Sustainable Development Advisory Committee in helping to bring about the transition to a resource-efficient and low-carbon economy.

RECOMMENDATION 22: To facilitate investor scrutiny of environmental markets, Government should consider integrating agreed standards of disclosure into corporate reporting guidance, and should encourage the establishment of voluntary benchmarks and consistent methods for corporate, pension fund and charity environmental disclosure.

The primary objective of corporate, pension fund and charity disclosure requirements is to improve the quality of information for investors without placing undue requirements on business. Current regulation requires pension scheme trustees 'to state their policy, if any, on Social, Environmental and Ethical investment' in their schemes' Statement of Investment Principles. A recent independent review of the regulatory regime that applies to Corporate Pension Schemes concluded that the regulatory burden on scheme sponsors should be reduced as it is cumbersome, administratively expensive, and potentially discourages the continued provision of good-quality schemes. Therefore, any additional disclosure requirements, voluntary or otherwise, would have to have undergone a robust cost–benefit analysis and consultation with stakeholders.

In terms of broader corporate disclosure, a response to this recommendation is incorporated in the section on environmental reporting responding to Recommendation 19.

RECOMMENDATION 24 (first part of recommendation): All interested parties, including Government, business, investors, employees and consumers, should consider how they can contribute to the implementation of CEMEP's recommendations.

This cross-cutting agenda must be driven forward across Government, and Government should consider whether existing structures and organisations can achieve this.

The Government welcomes the Report from the Commission for Environmental Markets and Economic Performance (CEMEP) as a valuable contribution to thinking on how the UK can make the most of the synergies between economic and environmental objectives. In its focus on realising potential positive economic benefits from the transition to a low-carbon and resource-efficient economy, the Report complements the conclusions of the Stern Review.

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Government is determined to demonstrate that ambitious action to tackle major environmental challenges is achievable, affordable and consistent with high and sustained economic growth. We will draw on CEMEP's analysis and recommendations to guide future policy intervention in this area, particularly on fostering innovation in environmental markets and decoupling environmental impacts from economic growth. As the Commissioners point out, this will involve action at the European, international and domestic level. The UK is building on its reputation of international leadership on climate change and other issues where multilateral policy frameworks are required.

As markets usually provide the best means of allocating an economy's resources, we welcome the Commission's acknowledgement that the policy framework for environmental markets must go with the grain of market forces. The role of Government is to act on behalf of wider society to correct imperfections in markets through the use of appropriate policy instruments in order to prevent adverse environmental and economic consequences without imposing unnecessary costs. All Government intervention takes account of the potential impact on wider economic and social objectives, including macroeconomic stability, business competitiveness and social inclusion. At the same time, Government recognises that there is a market failure in that the costs of environmental damage will largely be borne by future generations, but that these are unable to signal their preferences by engaging in today's markets. As Stern has shown, failure to address now the factors contributing to climate change risks imposing very significant costs on future generations.

The CEMEP Report offers a new way of thinking to help Government, business and others meet the big challenges in the transition to a low-carbon, resource-efficient and sustainable economy. Put simply, this new approach requires that different areas of activity, perhaps previously seen as separate, are brought together, allowing synergies to be better exploited and building links between, for example:

- the design of environmental policy and the potential for innovation and long-term economic growth
- the Government's search for better value for money in utilising public sector spending power and the potential for fast-tracking innovative solutions from the research and development (R&D) stage to the market
- the various efforts of the public and private sectors, central and local government, universities and industry in supporting innovation
- the medium- and long-term demand for the knowledge, expertise and skills that business will need in order to compete in the 21st-century global economy, and the capacity to take advantage of the opportunities available in a new greener economy.

We have not stood still. Much of the focus in this document is on how Government has already embedded the Commission's thinking in policy and strategy since the CEMEP Report was published in November 2007. The detailed response to each of CEMEP's recommendations sets out how Government is incorporating CEMEP's thinking into strategic planning and policy development going forward.

ANNEX

THE COMMISSION ON ENVIRONMENTAL MARKETS AND ECONOMIC PERFORMANCE (CEMEP)

THE COMMISSION ON ENVIRONMENTAL MARKETS AND ECONOMIC PERFORMANCE (CEMEP)

The Commission on Environmental Markets and Economic Performance (CEMEP) was established by the Government in the light of the Stern Review on the Economics of Climate Change. Its aim was to make recommendations which would help the UK to exploit the economic opportunities from the transition to a low-carbon, resource-efficient economy.

Commissioners were drawn from business, trade unions, academia and non-governmental organisations, and meetings were chaired jointly by the then Secretaries of State for Trade and Industry and Environment, Food and Rural Affairs.
The CEMEP report, published on 19 November 2007, sets out 24 recommendations for Government, business and others to drive investment and innovation in environmental markets in the UK, and in so doing seize the substantial opportunities for wealth and job creation.

The Report can be found at: http://www.defra.gov.uk/environment/business/commission/index.htm

Members of the Commission for Environmental Markets and Economic Performance

David Miliband – Former Secretary of State for Environment, Food and Rural Affairs (joint Chair)
Alistair Darling – Former Secretary of State for Trade and Industry (joint Chair)
Ian Pearson – Former Minister of State for Climate Change and Environment
Malcolm Wicks – Former Minister of State for Science and Innovation
Jim Brathwaite – Chairman, South East England Development Agency
John Cridland – Deputy Director General, CBI
Tom Delay - Chief Executive, Carbon Trust
Professor David Fisk – BP/RAEng Chair in Engineering for Sustainable Development, Imperial College
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Julie Hill – Programmes Adviser and former Director, Green Alliance
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