

enabling business in resources management

The report of the Innovation and
Growth Team for the Environmental
Goods and Services sector

Overview

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Department of Trade and Industry



This report focuses on actions to unlock UK competitiveness in goods and services relating to clean technologies and processes and the efficient use of energy, water and solid materials - collectively termed “resources management”.

The report captures the insights of industry, Government, investors and other stakeholders who formed the Innovation and Growth Team for the Environmental Goods and Services sector - one of several such Teams sponsored by the Department of Trade and Industry.

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A SEPARATE VOLUME IS AVAILABLE COVERING THE FOLLOWING TOPICS:

MARKET AND INDUSTRY CONTEXT

Market opportunities

Investment and finance

Skills, innovation and commercialisation of R&D

Sector support

Trade support

Demand-side measures

ACTION AREAS

Achieving consistency across the policy framework

Co-ordinating sector support

Using market levers to promote innovation

Plugging gaps in investment and finance

Tuning R&D and training to meet sector needs



chairman's foreword

This is the final report of the Innovation and Growth Team for the Environmental Goods and Services sector. As a partnership between Government, industry and other stakeholders, our objective was to define actions to build the competitiveness of this sector, in both the UK and overseas markets, over the next 15 years.

Globally, the markets for environmental goods and services are currently estimated at \$515 billion. The increasing demand for clean energy, clean water and the efficient management of our natural resources offers a major opportunity for UK businesses – with strong drivers leading to double-digit growth rates. At the same time however, the UK supplier base is highly fragmented, lagging in some areas of technology, and lacking a coherent voice. The UK is also falling behind its main competitors in terms of market share.

The key driver of market demand, particularly in the more advanced economies, is government policy and regulation on sustainable development and environmental protection. This makes the sector fundamentally different to other “regulated” sectors such as automobiles and chemicals, where market forces largely control demand.

As a result, the development of this sector requires particularly close co-operation and ongoing dialogue between government, regulators and industry. In the UK, the sector will only prosper and flourish if the Government adopts a long-term vision and strategy for major infrastructures and environmental outcomes; and “joins up” policy and regulation to support these goals. This includes empowering regulatory bodies to operate in the broader interests of consumers, the environment *and supplier competitiveness* over the long term.

The environment industry aims to invest and operate under “normal” commercial conditions, within the framework of policy and regulation. If the industry is to undertake long-term investment in innovation, skills, infrastructure and supply chain relationships, it will need to share a detailed understanding with Government and the regulators, and be more responsive to European policy developments. During our nine months of work, I believe we have demonstrated the value of open dialogue in developing such understanding, and a number of our recommendations seek to build on this.

For the purposes of its work, the Team divided the sector into three main categories – low-carbon energy, water and solid materials. In all three areas, there has been a lack of consistent long-term policy over many years. This has deterred investment, such that the UK now lags behind its overseas competitors in significant areas of technology. We therefore welcome recent Government initiatives to develop a vision and strategy for the UK energy and waste sectors, and DEFRA’s publication of a vision for water. We are concerned, however, that all three initiatives may fail to provide the policy commitments that would make the sector an acceptable risk for many investors. This industry will not thrive in the face of uncertainties in policy-driven demand.

The Team’s recommendations point to the need for a sector sponsor body, involving industry, Government, regulators, investors and other stakeholders. This would build on existing initiatives, provide a focus for this fragmented sector, and catalyse the co-ordination of policy and support measures. Team members are prepared to contribute actively and financially, if such a body is created. We also propose a public-private partnership for funding commercial-scale demonstration of new technologies.

At the outset, the Team made a number of observations on the current state of the industry. These are:

- **Incentives for low-carbon energy.** The overall direction of Government policy on low-carbon energy seems positive. The UK has a leading position on emissions trading, coupled with a range of other measures. We recognise specific concerns, such as the initial adverse impact of the New Electricity Trading Arrangements on renewable energy and combined heat and power, and the lead held by overseas competitors in technologies such as wind power. We hope to see robust strategies in the Government’s impending White Paper on energy policy.



- **Consolidation in the water sector.** There is no doubt that the UK has strong technology, a proven track record, and the experience and skills to compete worldwide in the growing market to provide clean water and sanitation. UK companies in this sector have consistently demonstrated high standards of delivery in the UK and the ability to transfer skills and expertise internationally. Worldwide, the water opportunity requires international companies with the scale and transferable expertise to compete. However, the regulatory stance on consolidation in the UK water industry has prevented the emergence of companies with the scale of our global competitors.
- **Waste policy.** Waste and solid resource management is a large and rapidly growing market, both in the UK and worldwide. Growth is dependent on the pace and enforcement of waste policy, as well as the innovative application of technologies to deal with increasingly complex waste streams. A critical success factor for suppliers is the presence of a strong domestic market that demands new process technologies and methods of waste minimisation. This does not exist in the UK today. Waste Directives emerging from Brussels are based on experience developed in Germany, Scandinavia and Holland, and the UK is currently struggling to put the required legislative frameworks in place. The Team looks forward to the impending report of the Prime Minister's Strategy Unit on the waste sector. However, until action is taken on fiscal incentives and other measures to help meet regulatory targets, the UK will not have the domestic market on which to build international competitiveness.

Our recommendation for a sector sponsor unit would provide a mechanism – hitherto missing – for constructive dialogue and co-ordination on these and other issues, so that the UK can unlock the path to future growth.

I believe the Team's recommendations provide a platform on which all stakeholders can build, in developing a truly competitive industry. In formulating its recommendations, the Team has had input from over 300 individuals, representing among others, Government and regional bodies, investment and finance houses, NGOs, trade associations, regulators, universities, major companies and SMEs. I would like to thank everyone who has participated in this consultation process.

Finally, I should like to thank the Chairmen of the working groups who have put so much effort into developing the recommendations and who will help to launch the final report; the members of the steering group; and particularly the project team of Dr David Moon and Jonathan Lonsdale, who have worked tirelessly throughout the past months. Dr Alistair Keddie, Duncan Prior and John Alty from the Department of Trade and Industry provided valuable guidance.

Robert Walker
Group Chief Executive, Severn Trent plc
Chairman, Innovation and Growth Team for the Environmental Goods and Services sector

November 2002



executive summary

- Worldwide, environmental markets are valued at more than \$500 billion. Demand for clean technologies and processes and for the efficient use of energy, water and solid materials - collectively termed “resources management” - is growing at more than 10% per annum.
- The UK has less than 5% share of the global market, and is falling behind its main competitors. The Innovation and Growth Team has identified actions to address the underlying problems, and proposes a platform to co-ordinate the next steps. These actions, listed below, will play a vital role in driving UK competitiveness, as well as enabling sustainable development.

ACTION AREA	PROBLEMS	MAIN RECOMMENDATIONS
<p>ACHIEVING CONSISTENCY ACROSS THE POLICY FRAMEWORK</p>	<ul style="list-style-type: none"> ■ In this sector, the financial returns are particularly uncertain due to dependence on policy factors. This deters potential investors. ■ Economic regulation of the energy and water utilities, and market conditions in the municipal waste sector, are perceived to be squeezing out the scope for innovation. ■ The design of environmental regulation does not take sufficient account of supplier perspectives. 	<ul style="list-style-type: none"> ■ Government, industry and the regulatory bodies in the environment sector should commit to joining up policy to facilitate innovation and the development of a more competitive supplier base. ■ Industry, Government and investors should agree the policy and market conditions that will keep investment risk at a level that attracts private sector capital to the environment sector.
<p>CO-ORDINATING SECTOR SUPPORT</p>	<ul style="list-style-type: none"> ■ There is a lack of co-ordination among the many bodies that support or influence this diverse sector - sector competitiveness is not being driven in a coherent way. ■ The fragmented supply side is not making an effective input to these bodies. 	<ul style="list-style-type: none"> ■ Industry, Government and other stakeholders should set up a sector sponsor body to promote and enable opportunities in resources management. ■ The sector sponsor body should help to strengthen UK support for overseas trade by the environmental sector.
<p>USING MARKET LEVERS TO PROMOTE INNOVATION</p>	<ul style="list-style-type: none"> ■ Government policy and legislation, which largely drives market demand in this sector (in contrast to most other sectors), has not provided strong incentives for innovation. ■ Sustainable procurement is not being implemented effectively across the public sector and industry. 	<ul style="list-style-type: none"> ■ HM Treasury should use fiscal measures to complement other policy actions in fostering innovation and growth in resources management. ■ Government and industry should commit to using sustainable procurement to drive innovation in resources management.



ACTION AREA	PROBLEMS	MAIN RECOMMENDATIONS
<p>PLUGGING GAPS IN INVESTMENT AND FINANCE</p>	<ul style="list-style-type: none"> ■ Many institutional investors take little account of the financial risks and benefits associated with resources management in their investment decisions. ■ The uncertainty of financial returns in this sector deters investors. ■ There is a gap in the financing of commercial-scale demonstration projects, apparently exacerbated by State aid restrictions. ■ Many SMEs in the sector do not meet the requirements for venture capital. ■ There are relatively few lead investors targeting private equity into this sector in the UK. 	<ul style="list-style-type: none"> ■ Government should make it clear that awareness of environmental risks and the benefits of environmental good practice is part of the duty of pension fund trustees, where these impact on long-term investment returns. ■ Government, industry and investors should develop a public-private co-financed fund that invests in commercial-scale demonstration projects for new environmental technologies. ■ Government should make available a tax credit to incentivise private sector investment in SMEs in the environment sector. ■ Government and industry should identify ways of developing investment mechanisms compatible with the State aid rules.
<p>TUNING R&D AND TRAINING TO MEET SECTOR NEEDS</p>	<ul style="list-style-type: none"> ■ Suppliers are deterred from working with universities on strategically important R&D. ■ The sector is not making effective use of recent initiatives on skills and technology transfer. ■ There is inadequate co-ordination between initiatives such as regional centres of excellence. ■ There is inadequate industry “pull” on UK environmental R&D. 	<ul style="list-style-type: none"> ■ Industry should take a lead in communicating sector priorities to academia for R&D support in resources management. ■ Industry should take a lead in improving the delivery of skills and training in resources management.

SECTOR SPONSOR BODY

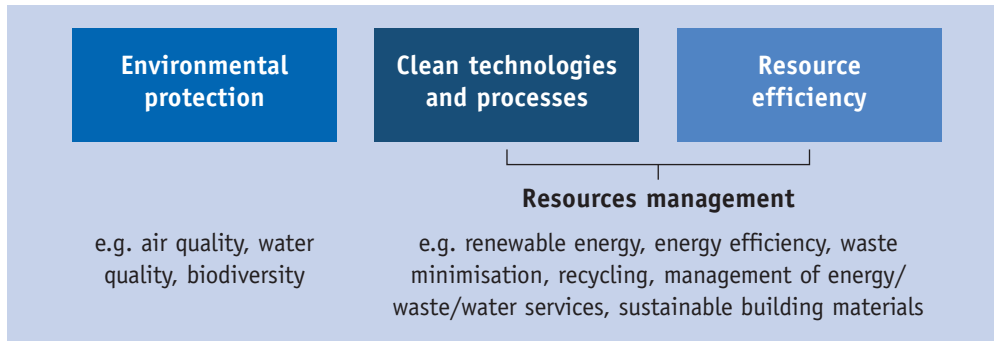
- Since the environment “industry” in its broad sense lacks a clear focus or representative body, we propose the sector sponsor body as a primary channel for industry commitment to the recommendations listed above.
- Industry should commit to high-level representation on this body, participation in its working groups, and the provision of staff on secondment. Members of the Innovation and Growth Team are willing to take part.



sector overview

SECTOR DEFINITION

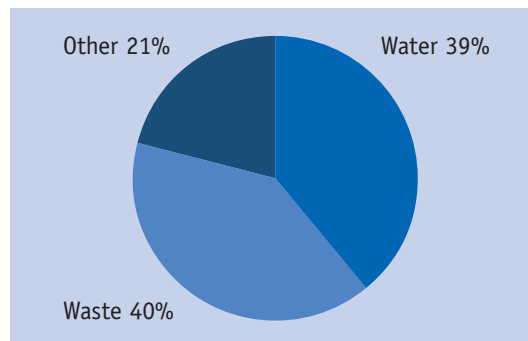
- The “environment sector” covers three market needs:



- The sector is diverse and fragmented on the supply side. However, the market is characterised by two common factors:
 - Environmental goods and services concern the management and protection of our natural resources.
 - Market demand is largely determined as a result of government policy and regulation (national and international).
- The Innovation and Growth Team (IGT) has focused on three broad market segments: low-carbon energy, water and solid materials. Each of these covers all three of the market needs identified above.

CURRENT MARKET SIZE

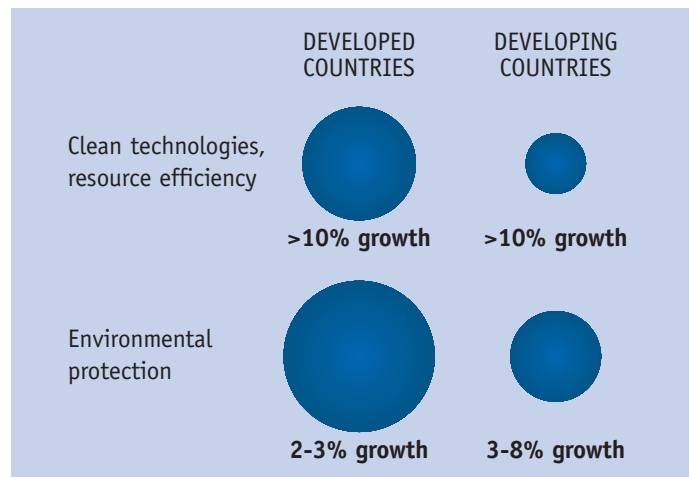
- Globally, the market for environmental goods and services has been estimated at \$515 billion (JEMU, 2002). This is similar in scale to pharmaceuticals and aerospace. The UK market is around £15 billion, and UK suppliers have a 4.7% share of the global market (around £16 billion turnover, including exports).
- Approximately two-thirds of the current world market is for “environmental protection” and one-third for “resource efficiency” (European Commission, 2002). (In this analysis, both categories included some elements of “clean technologies and processes”.)
- At present, waste management and water & wastewater treatment each represent about 40% of the total market worldwide (JEMU, 2002):





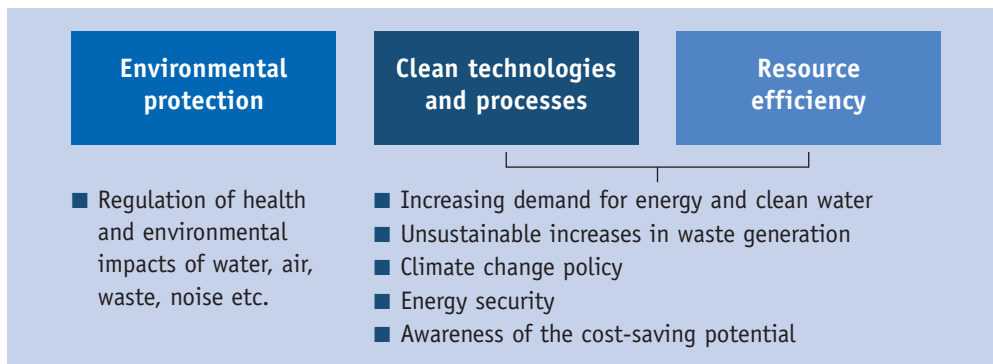
MARKET POTENTIAL

- Overall, the world market is forecast to increase by 3% per annum to \$690 billion by 2010 (JEMU, 2002). However, this estimate hides large variations between market segments.
- In particular, demand for resource efficiency and clean technologies and processes is expected to grow at annual rates of 10% or more (JEMU, 2002), particularly in the “developed” countries (Western Europe, North America and Japan) that currently account for over 85% of world markets. In these countries, demand for “end-of-pipe” solutions (e.g. in air pollution control) will grow relatively slowly.
- Demand in developing countries will grow at 4-9% per annum overall, with environmental protection, low-carbon energy and the provision of water and waste infrastructure as strong elements.
- The scale of growth in resource efficiency and clean technologies and processes is difficult to estimate, with some forecasts greatly exceeding the figures quoted above. Examples for specific market segments are:
 - *Wind energy*: growing at 20% or more per annum through to 2010 (HSBC, 2001), with a potential market of \$630 billion by 2020 (EWEA and Greenpeace, 2002).
 - *Waste management* (including recycling, waste minimisation and energy recovery) in the UK: doubling in ten years (JEMU, 2002).
- In schematic terms, relative market sizes and growth rates are:



DRIVERS OF MARKET GROWTH

- Primary drivers across the three market areas are:





- Environmental protection is largely driven by government regulation, which in the UK derives predominantly from European legislation. Much of the legislative framework is in place in developed countries, hence the maturity of this market (as indicated above).
- In contrast, the drivers for clean technologies and processes and for the efficient use of energy/carbon, water and solid materials have emerged over recent years. They are now well established and will increasingly “bite”. For example, the Kyoto Protocol on greenhouse gas reduction may enter into force in the near future, and this year’s World Summit on Sustainable Development made a commitment to halving the proportion of people without access to safe drinking water and sanitation by 2015.
- These market changes present big opportunities for UK companies - as well as contributing to sustainable development - and have therefore been the main focus of the IGT.

OPPORTUNITIES FOR THE UK

- Major opportunities include:
 - Large infrastructure projects, such as water supply and renewable energy
 - Equipment and technology, including data management and monitoring
 - Services, including consulting, project management and the outsourcing of resources and facilities management.



- Requirements for innovation include a large element of applications development, since “resources management” implies process changes and embedded technologies more than discrete products. Proof of application is therefore a critical success factor for competitiveness.
- The UK is perceived to be strong in:
 - Consulting and design services
 - Applications expertise, project development and operations management
 - Some areas of technology and R&D
 - The implementation of public-private partnerships
 - Financial services.
- The well-developed domestic market for water and wastewater treatment has given UK suppliers a strong position in overseas markets - accounting for around 80% of the UK’s environmental exports (JEMU, 2002). However, the slow development of demand for renewable energy and materials recycling in the UK has seen a corresponding lag in supplier capabilities (particularly in technologies).

CHALLENGES FOR THE UK

- In order to exploit the market opportunities, actions are needed to overcome current weaknesses:
 - The UK’s export growth rate has been half that of our American and European competitors.
 - The shares of the global market achieved by Germany and France, normalised to their GDP, are around 50% higher than the UK’s share.
 - Our market position in some of the fastest growing areas of resources management is weak.
 - Only a minority of UK suppliers are actively involved in overseas markets (JEMU, 2002).
 - Investors are wary of the sector in the UK.



- These weaknesses relate to a number of underlying problems in the UK:
 - *Risk*. The strong dependence of market demand on Government actions creates higher uncertainty of financial returns than in many other sectors of the economy. This is exacerbated by the track record of inconsistent and delayed policies over many years. As a result, investors perceive the sector in the UK to be a high risk. There is a need for effective anticipation of the response of suppliers and investors to new policies, as well as the resolution of current disincentives to investment.
 - *Lack of policy coherence*. Government policies and regulations are pulling in different directions. For example, the recent approach to economic regulation of the energy and water sectors has deterred innovation. In addition, enabling measures such as fiscal incentives are failing to reinforce progress towards policy targets. If the market opportunities are to be realised, there needs to be much more effective dialogue, aimed at aligning interests between different strands of policy.
 - *Lack of finance*. Commercial-scale demonstration is vital to overcome the risk hurdle perceived by investors. There is a shortage of suitable finance for such projects in the UK's environmental sector, apparently exacerbated by State aid restrictions. In addition, SMEs developing products and services that offer large environmental benefits are failing to attract venture capital. Innovative forms of financing are needed to kick-start participation from private sector sources of debt and equity.
 - *Lack of co-ordination*. Environmental markets are diverse, and the supply base is fragmented. Many generic schemes are available to provide support, but they are also fragmented, small, lacking in strategic coherence and difficult to access. Sector needs are not being communicated well to service providers. Greater co-ordination is essential.
- The IGT has made a series of recommendations to deal with these problems, summarised in the next Section. One aim is to create a more level playing field with our competitors, such as Germany - see box below.

COMPARISON WITH THE ENVIRONMENT SECTOR IN GERMANY

- Germany has reduced the uncertainty of policy-dependent demand and thereby encouraged private sector investment through a long-term consistent approach, which has involved:
 - Embedding environmental protection in the State constitution
 - Requiring policies to be checked against goals for wealth creation
 - Working towards long-term goals and devising policies that will create national markets and hence national supply chains - and then "selling" these policies to the European Union and other countries to enable new markets for German supply
 - Committing to long-term fiscal measures (e.g. the renewable energy feed-in tariff)
 - Providing various financing tools (many specific to the environmental sector) that enable higher risk projects to be developed and implemented.
- Germany has also provided support that is tailored to sector needs, by effective co-ordination and design. This has included:
 - Agreeing industrial-academic-political memoranda of understanding
 - Decoupling delivery from policy, e.g. setting up the German Environment Foundation to fund near-market research, and co-ordinating in-country promoters of environmental exports through ITUT (the national environmental technology transfer and export promotion body)
 - Developing bilateral strategies between industry and academia to place Germany in a leading position
 - Providing tailored support, funding packages and promotional tools for the environmental sector through Kreditanstalt für Wiederaufbau (KfW) and the regions (Länder)
 - Ensuring effective dissemination of information on available funding.

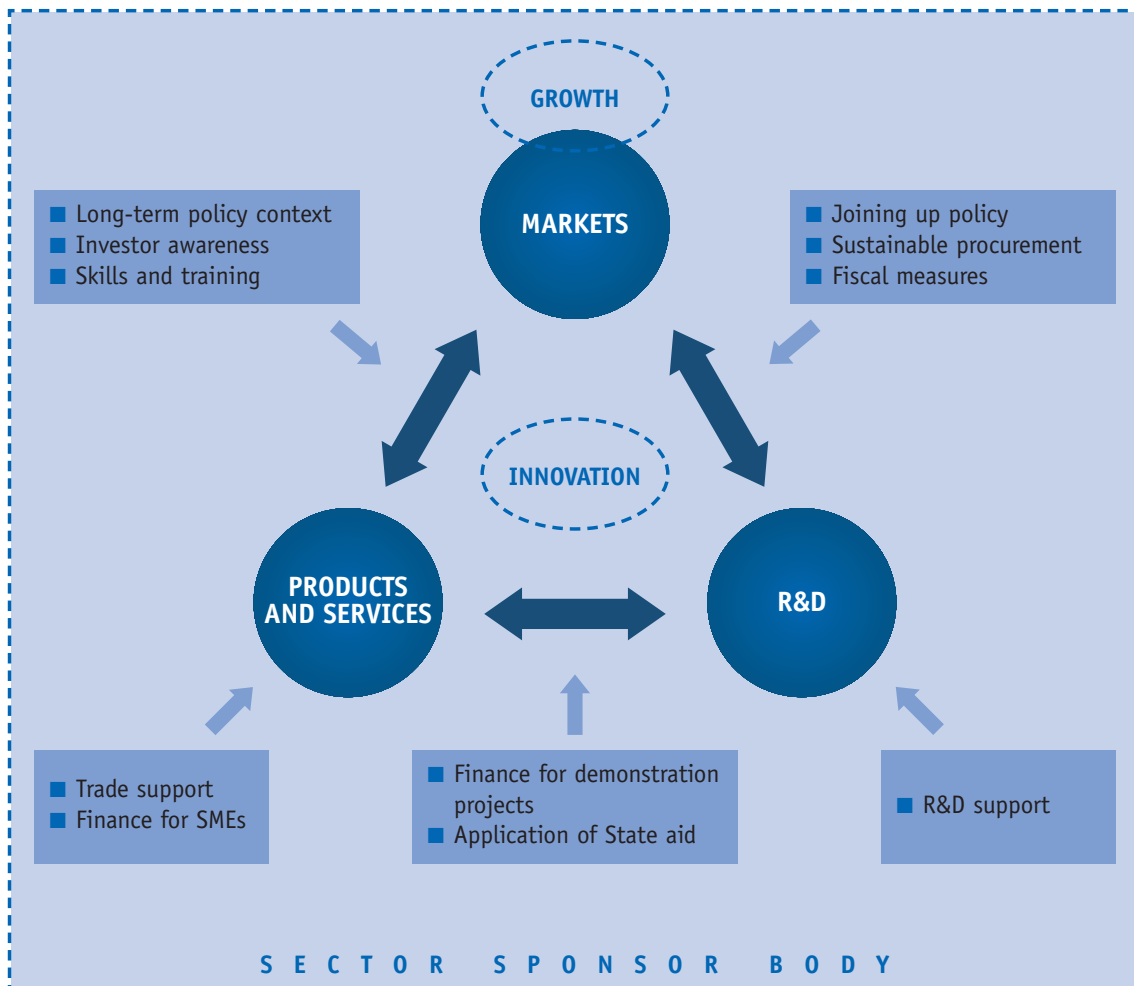


main recommendations

■ The IGT has highlighted five changes to unlock future UK competitiveness in resources management:

- 1. Achieving consistency across the policy framework
- 2. Co-ordinating sector support
- 3. Using market levers to promote innovation
- 4. Plugging gaps in investment and finance
- 5. Tuning R&D and training to meet sector needs.

■ The IGT recommends actions throughout the cycle of innovation and growth, as illustrated below. A common feature is that these actions would build on, and improve the effectiveness of, measures that the Government is already taking.





1. ACHIEVING CONSISTENCY ACROSS THE POLICY FRAMEWORK

- Bankers and equity investors have told the IGT that market conditions in the environment sector are driven or influenced by policy factors to a greater extent than in other sectors. In the UK, these factors create unusually high levels of uncertainty, and therefore risk, which inhibit investment. Uncertainties include:
 - The financial return where market demand or price is dependent on legislative mechanisms that are prone to change
 - Difficulties in obtaining planning/environmental consents, where the regulators do not have a responsibility towards policy objectives for e.g. renewable energy and waste management.
- Government can limit the risks by introducing greater consistency into the way that policy and regulation is defined and implemented.

RECOMMENDATION 1A

“Government, industry and the regulatory bodies in the environment sector should commit to joining up policy to facilitate innovation and the development of a more competitive supplier base.”

- Specific changes would include:
 - Improving the effectiveness of the Regulatory Impact Assessment of new legislation, with additional guidance on the evaluation of effects on the UK supplier base.
 - Ensuring that regulatory bodies promote innovation and sector competitiveness, in addition to their primary goals of environmental performance and price competition.

RECOMMENDATION 1B

“Industry, Government and investors should agree the policy and market conditions that will keep investment risk at a level that attracts private sector capital to the environment sector.”

- The basic need is to introduce a framework for structured dialogue between the stakeholders, for the purpose of anticipating market changes and removing hurdles to sector development. This dialogue would also inform the process of preparing Regulatory Impact Assessments.
- For example, the Government should give early warning of significant developments in European policy, and industry should identify ways of influencing policy design to UK advantage.

2. CO-ORDINATING SECTOR SUPPORT

- The environment sector is highly fragmented. Many UK suppliers selling into the markets for resources management do not even regard themselves as part of the “environment industry”.
- In addition, a wide variety of bodies impact on sector competitiveness - through policy, regulation, national and regional support, training, investment and other activities. The lack of a sector focus means that the competitiveness agenda is not being driven in a coherent way.

RECOMMENDATION 2A

“Industry, Government and other stakeholders should set up a new sector sponsor body to promote and enable opportunities in resources management.”

- The proposed new body would champion the actions needed to make the UK more competitive in environmental markets - particularly in tackling the growth opportunities in resources management.



THE VISION FOR A SECTOR SPONSOR BODY

- This body will enable the UK to:
 - Tune policies and regulations to be consistent with the development of a competitive supplier base
 - Increase the effectiveness of business support schemes
 - Remove barriers to the development of innovative solutions in resources management
 - Attract investment and finance into the sector.
- The primary agents for change will be:
 - Dialogue to anticipate market changes and jointly address hurdles to sector development
 - Co-ordination between the activities of multiple stakeholders
 - Concerted action to take forward initiatives of common interest, such as financial vehicles
 - Communication with a diverse sector and the promotion of greater networking
 - High-level leadership from both industry and Government to ensure that issues are resolved and actions pursued
 - Benchmarking good practice in sector development.
- The proposed overall metric of success is to increase the UK share of global environmental markets to at least equal the performance of our main competitors by 2010 (relative to GDP). This means an increase from the current level of 4.7% market share to 7%, similar to France. In addition, the sector sponsor body will define targets for growth in resources management.

STRUCTURE

- A high-level Strategy Team, initially chaired at Ministerial level, would define the agenda and seek decisions to resolve hurdles to competitiveness.
- An Implementation Team, located in the new DTI Business Relations Directorate, and partly staffed by high-fliers on secondment from industry, would implement the sponsorship activities.
- Ad-hoc Working Groups would tackle specific action areas. Led by a member of the Strategy Team, each Group would involve relevant stakeholders in taking forward specific initiatives.

MAIN FUNCTIONS AND BENEFITS

- Providing a focal point for dialogue in a sector characterised by many stakeholder bodies and a fragmented supplier base.
- Enabling sub-sectors (water, waste, energy, etc) to combine efforts in tackling the many issues of common interest (such as finance for demonstration projects).
- Providing a focal point for access to information on the sector (UK and EU policy developments, market intelligence, support services, etc), in response to the confusion identified by the IGT.
- Dealing with issues not covered effectively by other bodies, such as the effects of policy and regulatory developments on sector competitiveness and productivity.
- Promoting co-ordination between bodies with related responsibilities (e.g. parallel regional initiatives on skills, research and business/trade support, or the various Sector Skills Councils that are relevant to environmental markets).
- Feeding sector perspectives into the design of support services.



RECOMMENDATION 2B

“The sector sponsor body should help to strengthen UK support for overseas trade by the environmental sector.”

- Targeted actions would include:
 - *Increasing the high-level policy influencing* undertaken by the UK Government, regulators and environmental industry - at the international and national levels.
 - *Providing a first-stop shop* for information on markets and trade support for companies interested in environmental markets overseas.
 - *Focusing a high level of trade support onto a few priority countries* (per sub-sector) to achieve a critical mass of effort.
 - *Addressing perceived gaps in risk cover*, notably cover for UK investors to mitigate foreign exchange devaluation risk on major long-term environmental projects, and breach of undertaking cover against sub-sovereign municipal clients.
 - *Introducing more flexible financing*, especially for SMEs, including support for developing environmental projects overseas and attracting private sector finance.
 - *Extending ‘sector partnerships’* to additional areas of the UK environmental sector, such as waste management.
 - *Co-ordinating regional networks* for overseas trade support.

3. USING MARKET LEVERS TO PROMOTE INNOVATION

- Since Government policy and legislation largely drives market demand in this sector (in contrast to most other sectors), Government has a crucial role in creating the incentives for resources management.
- In recent years, the UK has seen the first examples of fiscal measures designed to underpin environmental policy objectives. But there is more work to be done on the “smart” design of measures to encourage radical innovation and UK competitiveness.
- Likewise, sustainable procurement and the demand of institutional investors for sustainability management could be powerful levers. However, their practical implementation has not matched policy intentions.

RECOMMENDATION 3A

“HM Treasury should use fiscal measures to complement other policy actions in fostering innovation and growth in resources management.”

- Environmental taxes create an incentive to find ways of reducing pollution and using resources more efficiently, including technological investment. This is particularly the case where future tax rises are defined in advance. However, taxes do not directly stimulate radical or long-range innovation. Therefore Government should:
 - Set long-term policy objectives for resources management
 - Specify *performance outcomes* that stimulate major innovation
 - Support implementation with a combination of fiscal, regulatory and other measures.
- A regulation provides a *credible* signal of a future market, as regulation is generally more difficult to change than a fiscal instrument. This reduces the risk to companies of investing to meet long-term market needs. However, regulation on its own may not be a sufficient condition for innovation to be stimulated. Fiscal measures are important in helping to create the market conditions, and in providing a *dynamic* incentive for change.



- Government should also use tradable permits more widely. These provide a strong incentive for companies to change their behaviour, as they give a clear message on how to achieve economic advantage. They allow different routes to achieving the same environmental outcome, and thereby encourage innovation.
- Moreover, under a trading scheme, a company that has the best solution reaps the benefits across the entire marketplace - giving a big incentive to innovate. In contrast, a tax measure gives each company only a small incentive to change - i.e. the benefit from cutting its own tax bill.
- To stimulate innovation effectively, fiscal measures have to be targeted on broad technology areas (such as “distributed generation”) that are likely to deliver the required performance outcomes at a competitive cost. This should be done without favouring specific technologies or stifling radical innovation. Certain principles should be followed:
 - The Government should develop an agreed expert view on these technology areas, based on industry dialogue (e.g. as in Germany).
 - Government should also engage in dialogue on the design of market-pull signals and other enabling measures (such as large-scale demonstration).
- Recycling of tax revenues has an important role in developing the markets stimulated by tax measures. For example, the Waste and Resources Action Programme (WRAP) is helping to expand the secondary markets for recycled materials, and the Carbon Trust’s Low Carbon Innovation Programme is helping to develop suppliers of low carbon technologies. The Government should use a greater proportion of the revenues from the Landfill Tax for sector development.

RECOMMENDATION 3B

“Government and industry should commit to using sustainable procurement to drive innovation in resources management.”

- Actions to stimulate innovation and supplier development include:
 - Reinforcing demand for good practice, such as recycled paper meeting standard specifications. This enables suppliers to invest and develop economies of scale, leading to lower prices and a more competitive supply base.
 - Demanding existing best practice, such as top quartile performance on energy efficiency. This has the effect of pulling the supply base towards higher norms.
 - Rewarding higher levels of performance against environmental outcomes in the selection of works and service contracts (through the weight attached to these criteria). This encourages bidders to come forward with innovative solutions.
- The public sector should take a lead in the following areas:
 - Targeting specific technology areas and inviting manufacturers to provide new products that go beyond existing best practice.
 - Funding first-of-a-kind large-scale demonstration projects that carry too high a (policy-derived) risk premium for private sector investors.
 - Requiring good environmental performance in PFI contracts, such as the energy efficient design of new buildings.
- Government and industry should set targets for specific types of sustainable procurement (such as the use of recycled paper), rather than issuing more general guidelines. Targets have the effect of sending a clear signal to suppliers and reducing the risk to them of any necessary investment. Nevertheless, the emphasis should be on specifying *performance outcomes* rather than specific solutions, in order to encourage innovation. In addition, evaluation of whole-life costs should be required.



RECOMMENDATION 3C

“Government should make it clear that awareness of environmental risks and the benefits of environmental good practice is part of the duty of pension fund trustees, where these impact on long-term investment returns.”

- There is mounting evidence that failure to take account of environmental risks could have a significant impact on shareholder value. There is also a growing consensus that good social, ethical and environmental performance can add financial value. Overall, the evidence indicates that socially responsible investment (SRI) is *at least neutral* with respect to investment returns.
- Investors ought to be aware of such evidence. However, recent surveys show that not all pension fund trustees consider SRI as a main agenda item, despite the Pensions Act requirement for a statement of investment principles.
- The Government expects to publish a Green Paper on pensions later this year. The IGT recommends taking the opportunity to put environmental issues more effectively on the agenda of pension fund trustees. This offers the following win-win benefits:
 - *For pensions performance*: ensuring that long-term returns are not harmed through inadequate attention to risk factors such as climate change, and overcoming any information failure regarding the upside potential of socially responsible investment and corporate social responsibility.
 - *For the environment industry*: ensuring well-informed demand for technologies and services to meet emerging environmental challenges, and raising the sector’s profile as a target for equity investment.
- This could involve Government in advising on good practice and encouraging pension funds to report annually on their implementation of investment policy regarding social, ethical and environmental issues.

4. PLUGGING GAPS IN INVESTMENT AND FINANCE

- Projects and companies in the environment sector face significant problems in attracting private sector finance. The funding requirement is a mix of debt and equity, but banks and equity investors perceive the risks in this particular sector to be unusually high. These risks are associated with the uncertainty in cash flows where market demand is largely dependent on fiscal and regulatory policies, as well as the uncertain performance of the new technologies required to meet policy goals. The long-term solution is to build confidence in more consistent policy-making - as in recommendation 1b above - but, in the short term, direct action is needed to kick-start private sector investment.
- For example, there are many goods and services that may achieve a moderate return of say 10-15% in a policy-driven market - such as cleaner alternative products, and process changes for energy efficiency and waste minimisation - as well as large environmental benefits within a short time horizon. But venture capital funds look for at least 25% return, and therefore such companies lack funding opportunities. The Government has to ensure there are financial vehicles that are suited to this lower return, if it is to achieve its goals for e.g. sustainable housing.
- Similarly, there is a shortage of funding opportunities for near-commercial demonstration projects, aimed at overcoming the major risks of first-of-a-kind investment in this sector.



RECOMMENDATION 4A

“Government, industry and investors should develop a public-private co-financed fund that invests in commercial-scale demonstration projects for new environmental technologies.”

- The goal of this fund would be to support demonstration projects that do not meet the size and risk requirements for conventional private sources of finance, but have the potential for a major contribution to environmental goals and significant replication.
- Such projects are vital in:
 - Providing reference sites that will attract overseas customers
 - Allowing UK companies to acquire the hands-on experience that will put them at the forefront of new markets
 - Giving private sector investors the confidence to fund repeat projects.
- The proposed concept is a fund of the order of £100-150M, designed to provide the “risk equity” element of project finance deals. The fund would invest in commercial scale demonstration projects alongside other investors (such as banks providing the debt component of the financing requirement). It might also provide finance for feasibility and project development costs, as well as support SMEs with the provision of performance bonds or other required security.
- The fund would combine Government and private sector funds. The Government contribution would be subordinated, taking a lower return in order to attract private investment and offset the risk premium associated with the sector. The Government’s intangible “return” would lie in the correction of a market failure, the contribution to environmental objectives, and the enabling of UK competitiveness.
- The compatibility of this recommendation with the risk capital guidelines for State aid will need to be checked.

RECOMMENDATION 4B

“Government should make available a tax credit to incentivise private sector investment in SMEs in the environment sector.”

- The role of this credit would be to attract investors to the sector, by offsetting the risk premium attached to environmental markets. This would complement existing generic schemes such as the regional venture capital funds, the Enterprise Investment Scheme, the R&D tax credit and the Green Technology Challenge.
- Eligible investments would be those that have a significant environmental impact, but which cannot currently show the secure financial returns, track record, funding requirement or stage of development to attract private investment directly.
- The credit should benefit those investment managers that are willing to work with SMEs in the sector to help them to grow.
- In addition, Government should work with the private sector to set up a trailblazer fund. This would be similar to the demonstration fund described above. Government would be a cornerstone investor, with a subordinated position, and the fund would aim to bring in private investors, both corporate and individual, through the tax incentive.
- The aim of the fund would be to become self-financing. As a large-scale fund, it would offer economies of scale in management costs, and act as a focus for specialist input from organisations such as the Carbon Trust and the Waste and Resources Action Programme. These organisations might also act as co-investors, and thereby gear up planned public investment in resources management with private finance. (The same applies to the demonstration fund.)
- Compatibility with State aid rules would need to be checked.



RECOMMENDATION 4C

“Government and industry should identify ways of developing investment mechanisms compatible with the State aid rules.”

- In the experience of IGT members, the operation of the State aid rules can be a major block to the achievement of UK policy goals for resource efficiency, environmental protection and sector development. The UK needs to work more smartly within the rules.
- The main problems lie in:
 - Restrictive limits on public support for demonstration projects (needed to overcome the risk hurdle in this sector)
 - Restrictive limits on public support for the purchase of environmental solutions (needed to offset the failure to fully internalise environmental costs into prices)
 - Delays in the State aid approval process - the environmental guidelines for State aid are relatively new, and the lack of precedent is believed to be inhibiting or delaying approvals
 - Failures by the UK to work effectively within the current State aid system.
- The proposed sector sponsor body would be charged with identifying ways of overcoming the perceived constraints on sector development. It would:
 - Define mechanisms that tackle sector issues while satisfying the State aid guidelines.
 - Identify ways of dealing with the current bottlenecks in scheme approvals - such as sharing good practice.
 - Collate evidence on the problems with the environmental guidelines, for discussion between DTI, the European Commission and other Member States.

5. TUNING R&D AND TRAINING TO MEET SECTOR NEEDS

- In recent years, the Government has introduced many initiatives to improve technology transfer and the provision of industry-relevant skills. If the opportunities in resources management are to be realised, the environment sector will have to take responsibility for making more effective use of such initiatives.

RECOMMENDATION 5A

“Industry should take a lead in communicating sector priorities to academia for R&D support in resources management.”

- **Industry-pull.** The environment industry has to think longer term about the needs of its customers, communicate these, and set up collaborative R&D with universities to address them.
- **Centres of excellence.** Industry and the Research Councils should identify centres of excellence that will address industry needs for the water, solid materials and low-carbon energy sectors. They should engage in dialogue with universities, Regional Development Agencies, Devolved Administrations and other funding bodies to encourage coherent development.
- **Large-scale demonstration projects.** Technology demonstrator schemes should be targeted at universities as well as industry.
- **Faraday Partnerships.** Three new Partnerships should be set up with a focus on the development of applied technologies for the sectors of water, solid materials and low-carbon energy. Industrial partners should take the lead in their design and implementation.



- **Co-ordination between initiatives.** Government should ensure co-ordination between existing schemes such as LINK and Faraday where the same technical area is being supported.
- **Strategic framework for research priorities.** The Research Councils should develop a more effective framework within which companies can engage in the setting of specific research priorities.
- **Barriers to university participation in applications development.** The Government should tackle the factors that limit the incentive for academics to work with industry - such as the need to publish results and the absence of direct financial return to individuals. (This is not just an environment sector issue.)
- **Catalyst for action.** The proposed sector sponsor body would seek action on these issues.

RECOMMENDATION 5B

“Industry should take a lead in improving the delivery of skills and training in resources management.”

- **Industry action.** Industry has to take responsibility for improving its business and technical skills to meet the opportunities in resources management.
- **Training for professionals.** Professional bodies should update their training requirements to include issues such as resource efficiency, sustainable design, sustainable procurement and financial accounting for environmental factors.
- **Postgraduate training.** Research Councils should fund Masters-level technology and engineering programmes in low-carbon energy, solid materials and water to encourage good quality UK graduates to join the sector.
- **Sector-specific “pull” on skills and training.** Whilst existing mechanisms offer a reasonably good platform for skills delivery, education and training bodies should operate these mechanisms with greater strategic co-ordination and more industry involvement.
- **Sector Skills Councils.** A number of the anticipated Sector Skills Councils will cover the environmental goods and services sector. The Sector Skills Development Agency should consider funding a coordinating body to ensure that sector needs are handled effectively.
- **Vocational education.** The Learning and Skills Council should consider selecting a handful of Further Education colleges to become Centres of Vocational Excellence for resources management, to cater for the demand for vocational and technical provision.
- **Faraday Partnerships.** These Partnerships bring together national environmental training provision in higher education through networking. They should enhance their strategic role by assessing industry training needs and checking that these are met.
- **Co-ordination across skills and training bodies.** The proposed sector sponsor body would catalyse links between stakeholders and broker dialogue on how best to meet sector needs.



next steps

- Members of the Innovation and Growth Team have committed to forming an interim group to develop the sector sponsor body. This group will:
 - Secure appropriate industry participation
 - Advise on the design of the sector sponsor body
 - Guide and prioritise initial activities.



team membership

STRATEGY TEAM

- **Objective:** To guide and review the work of the IGT.

Robert Walker	Group Chief Executive, Severn Trent Plc (<i>IGT Chairman and Team Leader</i>)
Edward Brown	Marketing Director, Rentokil Initial Plc
Ross Fairley	Partner, Environmental Law Group, Allen & Overy
Dr Malcolm Hutton	Managing Director, Environmental Resources Management
Dr Alistair Keddie	Acting Director-General, Innovation Group, DTI
Charles Nicholson	Group Senior Adviser, BP
Professor Geoff Randall OBE	Director, Global Safety, Health and Environment Operations, Astra Zeneca
Joanna Key	No.10 Policy Unit
Dr Richard Williams	Manager, Industry Group, 3i

MARKETS TEAM

- **Objective:** To highlight how market changes could create significant opportunities for the long-term competitiveness of the UK-based environmental goods and services industry.

Phil Simmons	Environmental Projects Manager, TXU Energy (now part of Powergen) (<i>Team Leader</i>)
Richard Barnard	Managing Director, Ashact Ltd
Dr Paul Brooks	Group Environment Manager, Corus
Jeff Chapman	Export Promoter - Energy and Environment, Trade Partners UK
Henry Derwent	Director, Climate, Energy and Environmental Risk, DEFRA
Emma Howard-Boyd	Head of the Jupiter Environmental Research Unit, Jupiter Asset Management
Gareth Hughes	Managing Director, Marsh Specialty Operations Ltd
Dr Paul Leinster	Director of Environmental Protection, Environment Agency
Dr Seumas Munro	Director, SecondSite Regeneration Ltd



INDUSTRY TEAM

- **Objective:** To identify how the UK-based environmental goods and services industry can achieve long-term competitive advantage in the face of changing market requirements.

Prof. Tom Stephenson	Head of Water, Offshore and Welding, Cranfield University (<i>Team Leader</i>)
Carole Arumainayagam	Director, Societe Generale Asset Management UK Limited
Alan Bevan	Industry Economics and Statistics Directorate, DTI
Clive Boyle	Business Development Director, QDS Environmental Ltd
Dr Jack Frost	Director, Johnson Matthey Fuel Cells
Andrew Green	Technical Director, BHR Solutions
Ross Hilliard	Director of Compliance and Risk Management, Shanks Group Plc
Bernard McNelis	Managing Director, IT Power
Stewart Purchase	Sales Director, Viessmann Ltd
Nick Robins	Head of SRI Research, Henderson Global Investors Limited
Dr Jonathan Williams	Chief Executive, Marinotech South Ltd
Tony Williams	Proposals Director, Biwater Treatment Ltd Representative of DTI Bioscience Team

MARKET SOLUTIONS TEAM

- **Objective:** To identify innovative actions to change demand-side conditions that would significantly help in developing the long-term competitiveness of the UK-based environmental goods and services industry.

David Elliott	Director, Policy & Economic Practice, Environmental Resources Management (<i>Team Leader</i>)
Nicola Ellen	Environment Manager, Safeway Stores Plc
Dr Martin Gibson	Programme Director for Envirowise and Biowise, AEA Technology Plc
Chris Hewett	Policy Development Manager, Environment Agency
Rob Lake	Head of Engagement and Corporate Governance, Henderson Global Investors Limited
Geoff Lane	Partner, PricewaterhouseCoopers
Allen Norris	Environment Manager, Pilkington Plc
Chris Staples	Associate, Environmental Law Group, Allen & Overy
Bernie Walsh	Environment, Business and Consumers Division, DEFRA



INDUSTRY SOLUTIONS TEAM

- **Objective:** To identify innovative actions to change supply-side conditions that would significantly help in developing the long-term competitiveness of the UK-based environmental goods and services industry.

Dr Rob Wylie	Partner, The WHEB Partnership (<i>Team Leader</i>)
Dr Frans Berkhout	Science and Technology Policy Research Unit (SPRU), and Director of the ESRC Sustainable Technologies Programme
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Dr Piers Clark	Director, New Business Ventures, WS Atkins Water
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Bruce Jenkyn-Jones	Investment Director, Impax Asset Management
Peter Jones	Director, BIFFA Waste Services
Neil May	Chairman, Natural Building Technologies Ltd
Ian McKenzie	Director, Electronic Communications Strategy, Trade Partners UK
David Middleton	Chief Executive, Environmental Business Communications
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EXPORT SOLUTIONS TEAM

- **Objective:** To identify innovative actions that would significantly help in developing the international competitiveness of the UK-based environmental goods and services industry.

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British Biogen	National Trust
British Water	British Photovoltaic Association
British Wind Energy Association	Royal Institute for International Affairs
Combined Heat & Power Association	Royal Society for the Protection of Birds
East Midlands Development Agency	Soil and Groundwater Technology Association
East of England Development Agency	Scottish Enterprise
Environmental Industries Commission	Scottish Executive
Envirolink NW	South East of England Development Agency
Environment Industries Federation	South West of England Regional Development Agency
Environmental Services Association	The Combustion Engineering Association
Forum for the Future	The Fabian Society
Friends of the Earth	UK BioIndustry Association's Environmental Technology Group
GAMBICA	UK Centre for Economic and Environmental Development
Green Alliance	UK Forum for the Environment Industries
Greenpeace UK	Welsh Development Agency
Institute for Environmental Management and Assessment	WWF UK
Imperial College: Centre for Energy Policy & Technology	Yorkshire Forward
Environmental Industries Forum in the East Midlands	

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SUBCONTRACTORS

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Environmental Resources Management*	Oxygen Marketing Ltd

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British Water	HM Treasury
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Carbon Disclosure Project	Impax Asset Management
Classic Fund Management	Imperial College
Conduit Ventures	ING Bank
Department for the Environment, Food and Rural Affairs	Innogy
Department for International Development	Innovest
Department for Trade and Industry	Jupiter Asset Management
Department for Work and Pensions	Kirklees Metropolitan Council
Dresdner Kleinwort Wasserstein Research	Lattice Properties
EA Capital	Learning and Skills Council
Engineering and Physical Sciences Research Council	Merrill Lynch Investment Managers
Environment Agency	Natural Environment Research Council
Environmental Supply Chain Forum	New and Renewable Energy Centre
European Bank for Reconstruction and Development	NIB Capital Bank
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Oxford Technology Venture Capital Trusts	Sustainable Asset Management
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SG Securities	Waste Industry National Training Organisation
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IGT PROJECT TEAM

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