ENVIRONMENTAL Scientist

Journal of the Institution of Environmental Sciences

Vol 11 No 3 ● May-June 2002

Editor: Robert Fuller ● Assistant Editor: Derek Hall

Established 1971 ● ISSN: 0966 8411

FEATURE ARTICLES

Rubbish or resource?

Towards a sustainable waste strategy

Professor Lynne E. Frostick

The principle of Sustainable Development is now fully embedded at all levels of Government thinking and policy making. Local Agenda 21 has brought environmental issues to the attention of the population as never before and the Environment Agency, at its inception in 1997, was charged with ensuring that the nation embarked on a steady march towards sustainability.

The European Union has been influential in promoting action on environmental issues amongst national governments, industry and commerce. Over the past ten years there have been 15 new directives concerned with improving environmental performance which have a specific emphasis on waste (e.g. Packaging and Packaging Waste Directive, 1994; Hazardous Waste Incineration, 1994; Landfill Directive, 1999).

Developing a waste strategy that encourages waste reduction and promotes recycling and re-use is the cornerstone on which sustainable development might be built. The waste of materials and resources is at the heart of an unsustainable system – if materials are not wasted fewer new resources will need to be extracted and more could be left for successive generations to use.

In 2000, DEFRA (then the DETR) published the Waste Strategy 2000 which began to address some of the challenging issues that surround waste production and treatment. It presents a clear picture of a sustainable future with some hints about how it might be achieved – and runs to over 300 pages! This paper attempts to summarise some of these issues and evaluate the effectiveness and desirability of the measures that might be introduced to achieve a sustainable UK.

What is waste? How do we dispose of it?

Items become waste once they are discarded by the user and disposed of with no potential for reuse, recovery or recycling of the component materials. This is more likely when commodities contain mixed materials (e.g. plastics of different kinds, glass with plastics etc) and/or when they are discarded with other, contaminating materials (e.g. paper with food waste).

The UK produces 400 million tonnes of waste per year, with 78 million tonnes coming from industrial and commercial activities and over 28 million tonnes from domestic sources (municipal solid waste or MSW). The rest comprises sewage sludge, agricultural and dredging wastes and spoils from demolition and mining.

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At present a total of 40 per cent of the resource in industrial/commercial waste and 17 per cent of municipal waste is recycled or recovered in some way. The record for some wastes is better than for others. In industry, for example, 89 per cent of metals and scrap equipment and 76 per cent of paper and card are recovered but only 21 per cent of waste chemicals are re-utilised. For all wastes that are not recovered the main disposal route is to landfill (47 per cent industrial, 66 per cent commercial, 83 per cent MSW) but the Landfill Directive (1999) is bringing about major changes in the way waste is treated. The main features of this directive are:

- challenging targets for the reduction of biodegradable municipal waste going to landfill;
- banning of co-disposal of hazardous and non-hazardous wastes and requiring separate landfills for hazardous, non-hazardous and inert wastes;
- banning disposal of tyres to landfill from 2003;
- banning the landfill of liquid waste, infectious clinical waste, and some hazardous wastes from 2001;
- additional controls on the monitoring and closure of sites.

These new and more taxing requirements are set to bring about a major change in the waste management industry. The process of re-licensing all landfill sites in the country to preclude co-disposal is falling to the already over-stretched Environment Agency. In addition, the waste management strategies of the many local authorities where landfill is a major disposal option are now in urgent need of revision!

> ***'Landfill is becoming the option of last resort'***

Over the past five years, landfill has become the pariah option for the following reasons:

- it is a waste of resources and considered unsustainable;
- in some areas close to large urban populations suitable sites are scarce;
- methane, a powerful greenhouse gas, is released when biodegradable waste is landfilled.

But landfill will continue to form part of a balanced portfolio of disposal options into the foreseeable future as the UK has geological sites that are suitable for 'safe' landfill and none of the current alternatives are sufficiently flexible and/or acceptable to fill the void.

The resource loop

Waste of resources occurs at all stages in the cycle of use, from production, through consumption to disposal. When no wastage occurs, then the resource loop will be closed and sustainability achieved.

Each of the stages is the subject of different legislation and regulation and much emphasis is placed on the disposal phase through EU directives and associated national legislation such as the landfill and end of life directives and through targets set by government e.g. those for recycling municipal waste and for reduction in the amounts of industrial and commercial waste going to landfill:

- to recover value from 40 per cent of household waste by 2005;
- to recover value from 45 per cent of household waste by 2010;
- to recover value from 67 per cent of household waste by 2015;
- to reduce the amount of industrial and commercial waste sent to landfill by 15 per cent by 2005.

Much remains to be done to improve performance in each of the steps in the resource loop. If recycling is to become more effective either consumers need to be convinced of the imperative to buy recycled goods 'for the good of the environment' or recycled goods have to be cheaper than those made with virgin resources. Trends for recycling over the period 1984-98 show that, while there has been an improvement for glass, aluminium cans and paper, the levels of recycling for plastics has remained low. In response to the slow rate of change the government has introduced the Waste and Resources Action Programme (WRAP) with the following goals:

- to achieve a significant increase in waste reduction and re-use;
- to double the present recycling and composting rates.

Although recycling can be effective it is a strategy that is introduced late in the cycle of resource use. The greatest gains can be made through treating the whole cycle of production, consumption, and disposal as a single entity and re-engineering the processes to create usable resources out of disposal. Initial evidence suggests that placing an 'end-of-life' responsibility on industry can encourage some innovative and environmentally positive thinking.

Rethinking our approach

At present, product designers generally consider only fitness for immediate use. As a result, plastics are mixed together and become virtually inseparable, glasses are laminated with other materials that render them unrecyclable, etc. In addition, the production and waste management industries have little if any contact and there is little evidence that they see themselves as part of a single supply chain. The waste management industry is seen both by itself and by other industries as providing a 'clean up' service, not as a potential source of the raw materials for the next production line.

Yet the only acceptable solution to the problem of the growing mountain of waste is to design each product in a resource-efficient way and to ensure it has features that suit it to the preferred disposal route.

But what type of disposal? Landfill is being discouraged and increasingly becoming the option of last resort. Incinerators figure widely in local waste management plans and many major cities are planning waste-to-energy incinerators to take the majority of MSW. If a commodity is to be incinerated it must be designed with a high calorific value and it must burn cleanly. However, all authorities that resort to incineration are finding planning permission difficult and

potentially divisive.

Few people want an incinerator in their neighbourhood, partly from fear of harmful emissions (particularly dioxins and furans) and the constant passage of waste lorries to feed the plant. Incineration has a bad reputation, largely derived from a succession of health scares in France and Japan, that is difficult to live down.

Composting organic waste is a favoured option in many waste strategies, particularly for the organic components of MSW. At present most waste management companies operate composting sites for green waste

> ***'Recycling is often held up as the 'green' option, but this can be far from the case. For example, the recycling of many plastics is difficult...'***

from gardens and some pilot projects have composted other wastes including self-segregated organic materials from MSW, sewage sludge and chicken wastes. If a material is to be composted it must be susceptible to decomposition by aerobic bacteria over a period of not more than 12 weeks without harmful by-products. However, following the foot-and-mouth outbreak of 2001 composting of meat waste has been banned pending further investigation of the survival of pathogens during the composting process.

Other problems arise from the amounts of compost that would be produced if all organic MSW were composted in major conurbations. One example is that if the organic waste from central London were composted and had to be spread on the available open spaces, each piece of land would have to receive a pile of compost over 30cm high each year! In most circumstances selling the compost is not an option due to contamination with plastics, glass and other undesirable materials.

Pyrolysis is an alternative for organic wastes, particularly for some industrial by-products and residuals such as tyres. It is a process carried out at high temperature without oxygen and it decomposes liquids and solids to produce gases that can be used to generate energy. It is a valuable process for recovering some materials but it is also expensive and is uneconomic for many applications.

Recycling is often held up as the 'green' option, but this can be far from the case. For example, the recycling of many plastics is difficult. Some processes are energy inefficient and produce sub-standard materials that cannot be used in new applications and the market is therefore restricted. Other problems arise from the import of products to countries where there is no market for the recycled raw material which might arise from them e.g. wine bottles in the UK have produced a glut of brown and green glass which cannot be re-utilised in our own diminutive wine production. Questions have to be asked as to whether it is sustainable to ask individuals to spend time and fuel separating these commodities and transporting them to centralised collection facilities.

For ease of recycling, commodities must be easily separated into their component parts and each part must be designed for a particular clean and energy-efficient recycling process.

Conclusions

There is obviously no panacea, and local waste management strategies will need to remain individual and suited to the area needs. However there is an urgent need to rethink the sequence of events that lead to a commodity becoming part of the growing waste mountain. Both antecedent and contingent strategies are needed to tackle the major threat to the environment that waste represents.

Amongst the antecedent strategies, education must play a major part, but it cannot achieve a step change on its own. It has to be combined with a radical rethink of product design, linking design directly with the end-of-life. When this is accompanied by a change in the culture of the waste management industry – moving away from a purely dumping mentality to one more like that of the extractive industries – real progress will be possible. What is required is a shift in the thinking and behaviour of both industry and individuals. The role of government is to provide the right balance of incentives, penalties and regulations to bring about this shift in the shortest possible time.

■ *Reprinted from* Science in Parliament, *Vol 59 No 1, Spring 2002 with the kind permission of the publishers.*

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Waste management – delivering change through regulation

Dr Cathy O'Brien
President, Institute of Wastes Management

The role of the regulators

There are two groups of regulators involved in the control of waste in the UK, the local authorities and the environment agencies.

The local authorities, at county, district and unitary level are all involved in the process. Even in a unitary authority there is more than one department involved including environmental health, trading standards, planning, wastes collection and disposal. Within non-unitary authorities the districts collect and enforce against flytipping and the counties dispose of wastes; both levels can provide recycling facilities and encourage waste minimisation. Planning can be at both levels and trading standards also have a role at county level in relation to packaging and animal by-products.

The other group of regulators is the Environment Agencies. Their role is permitting activities and controlling pollution through waste management licences, exemptions, and pollution prevention and control (PPC) permits. The disposal of hazardous wastes is monitored through a consignment system. They also register carriers of waste. The Environment Agencies collect data on waste production in industry and commerce together with data on quantities managed at facilities with licences or permits.

The Agencies also enforce the producer responsibility regulations for packaging, involving registration of all those involved in packaging and supply of packaged goods. Registered organisations have to prove that they have recovered value from or recycled certain percentages of the packaging that passes through their control. The Agencies have powers to deal with illegal activities in relation to waste management, and can examine duty of care documentation.

The Agencies have responsibilities to encourage sustainable development and provide advice to government on policy and practice.

The materials cycle – regulatory control

An examination of the regulatory controls on the materials cycle, the push and pull factors that influence corporate and individual behaviour in relation to waste management.

Extraction

The first element of the materials cycle is the production of raw materials, that is minerals and agricultural produce. The controls here relate mainly to production. There is an aggregates levy coming into force, which will affect the economics of aggregate production and may favour the use of secondary aggregate, aiding recycling of suitable waste materials.

There are no specific legislative controls for wastes generated through these processes with the exception of animal wastes. The UK is currently subject to EU infraction proceedings on this matter.

Non natural materials produced as wastes from these processes would benefit from control, and there are certain materials where producer responsibility might be useful e.g. farm films.

Production and distribution

Wastes produced by industry and commerce are subject to economic instruments through the landfill tax. The management of wastes is controlled by a legal duty of care, ensuring that wastes are passed to authorised persons preventing flytipping of wastes. Hazardous wastes are subject to controls requiring more detailed documentation of the chain of disposal.

Certain types of industry are subject to PPC permits requiring resource efficiency. Any industry involved in packaging is subject to producer responsibility. In future other industrial sectors will have producer responsibility, through initiatives on end of life vehicles and waste electrical and electronic equipment.

Advice is available to industry and commerce on waste minimisation through supply chain pressure from industries implementing EMS. There are also waste minimisation clubs across the UK linked into the government sponsored Envirowise programme.

These wastes are addressed by the waste strategies but there are no additional regulatory drivers. Trends in waste production from industry cannot be estimated, as there has only been one national survey.

In the main the drivers are economically driven, through landfill tax and producer responsibility with a minor impact through PPC permits. There are no economic drivers to use secondary materials rather than primary materials and there are no incentives to use products made from secondary materials.

Consumption

The end-users of economic output are the public, who have no duty of care in relation to the wastes they pro-

New web site and e-mail addresses

The IES has new e-mail and web site addresses:

- **e-mail:** ies-uk@breathemail.net
- **web site:** http://www.ies-uk.org

duce. The wastes generated by the public are managed by local authorities and are subject to targets in the waste strategy 2000, and the landfill directive. Whilst the landfill tax applies to these wastes, the impact on the consumer is indirect, via the council tax. There is no recognisable direct charge on householders for the wastes they produce.

The present charging structure for waste management means that there are few resources for alternative operations…

Waste generation is related to consumer choices, lifestyle issues and purchasing practices. Public education is left to the local authorities. Some have tried to engage the public through campaigns like 'Slim Your Bin' involving all the authorities in the Anglian region.

A national campaign to encourage waste minimisation and recycling would be more efficient and effective; to advise the public in advance of any other requirements needed to halt the increasing waste mountain. Time series data for this element of the waste pile indicates an average growth of 3 per cent per annum.

Economic instruments to deliver change

Current economic instruments include the landfill tax; increases at the end of the current escalator in 2004 are needed since the current levels are not delivering sufficient incentive for diversion from landfill. Early notification of the increase will help to move towards more sustainable options in advance of the change.

Tradable permits are proposed in England for local authorities to control the amounts of waste that can be landfilled to work towards the reductions required in the landfill directive, but sanctions for failure to comply are vague.

The proposed aggregates levy is providing impetus for industry to use more secondary aggregates already. The Institute of Wastes Management and the Institute of Civil Engineers are working together on the development of specifications for use of secondary aggregates.

A future possibility is direct charging of the householder as an economic instrument for change; the concept works in many parts of Europe at present. There are potential benefits of incentives for waste minimisation from the householder. The Institute of Wastes Management is initiating a study into the methods of direct charging used in Europe and the positive and negative social behaviours that result.

The government proposed pilot rebate systems for householders who generate less waste; two London boroughs are rewarding householders with £10.00 if they participate in recycling for a six month period.

Duties or powers

The driver for regulators is whether it is a duty i.e. they must do it, or a power, where they can do it. In a regime where resources within the public sector are tight this is important and influences what is done, unless specific ring fenced finance is provided from government.

Key players in delivery

Local authorities have a key role in relation to household waste, but influencing waste generation is difficult. Service delivery is monitored through Best Value, which can drive improvements to service.

The Environment Agency has a major role in the development of timely guidance and the application of regulation into permits, enforcement of standards of operation and against illegal activities.

National government's role is to develop timely legislation to European time-scales, instruments for change and funding the key players within the public sector.

A new body, the Waste and Resources Advisory Programme (WRAP), will hopefully provide further markets for recyclables and will foster green procurement.

The private sector role in the delivery of waste management to both the private and public sector is increasing. Waste collection and disposal contracts are long term to recoup capital investment. Partnerships have become increasingly important in meeting the challenges of the waste strategies.

The present charging structure for waste management means that there are few resources for alternative operations and supporting recycling activities. Charges at the household level are subsumed within the council tax and are relatively low, leaving local authorities in the difficult position of having to fund higher cost services than the traditional disposal to landfill.

Limiting issues

The Agency has resource constraints in being able to deliver effective enforcement. Streamlining local government involvement in waste would be beneficial.

Timescales for implementation of legislation can be problematic, seen currently in the landfill directive and the ozone depleting substances regulations. Government does not act early enough to give sufficient time for all those involved to deliver the requirements. The principle of sustainable government should apply here in ensuring that implementation problems are not passed on to future administrations.

Replicable and reliable data has long been a problem in the waste industry. Improvements have been made with access to government and Agency survey data, but time series data for industrial wastes and a more streamlined approach to municipal wastes is needed.

There needs to be considerable investment in infrastructure to move away from landfill and support for national and local level education and awareness campaigns to improve participation and promote responsibility at the household level.

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Professionals and sustainability

Professor Stephen Martin

Communities of practice

Interest in the environment has been around for a long time. In ancient Greek civilisations and in Biblical times, the emphasis lay on nature and the impact of human activity. Today, however, we are in a new phase of environmental consciousness: concern for the environment is no longer a discrete issue but is regarded as pivotal for human development. No single event has caused this change, it is a result of catastrophes in the 1970s and 80s such as Seveso, Bhopal, Chernobyl and Exxon Valdez.

This change in consciousness – now referred to as sustainable development (a phrase coined in the late 1980s by the Bruntland Commission and enshrined as a common policy objective by over 170 states at the UN Earth Summit in 1992) – has spawned a huge number of definitions (over 200), strategies and action plans. All over the world, governments, business and organisations and people from all walks of life are trying to make sense of sustainability.

What does it mean practically and in some cases spiritually to them?

It is worth a brief digression here – about the scourge of sustainability and other concepts – known as the fallacy of misplaced concreteness. This is when a concept is used so frequently that after a time everyone using it not only assumes that they know what they mean when they use it, but everyone else means the same! I hope that none of us fall into this troublesome trap.

The drivers for this change in consciousness are not rabid environmental campaigners, though they have played a crucial role in pointing out the problems, but the incontrovertible evidence that a degrading environment is impinging visibly, often terribly, on other policy areas. None of us need reminding of September 11 2001 and its impact on security; nor of the impact on human health and the economy more generally.

Professionals are also under fire from the general public and governments. This is putting increasing pressure on professional institutions and associations which represent them – many of these are struggling to protect their members – as well as the public.

Why is this happening? Why are doctors, lawyers, surveyors, civil engineers, indeed many of the 5.5 million people who call themselves professionals, beginning to call for more help and guidance from their professional associations? Indeed many of them are waking up to the fact that professionals in all sorts of activities increasingly have to prove their competency throughout life. As the chairman of the BMA's Medical Ethics Committee stated recently, 'the days when patients simply left it to doctors to try what they thought best are over.'

As one high profile commentator said recently, 'we have gone from a "trust me" culture to a "show me" culture' – which is why there is a new and growing emphasis on occupational standards, competency and codes of conduct. There is clearly a growing demand for greater professional transparency in such areas as ethics, environmental and social performance and other societal priorities. A number of recent initiatives have begun to wrestle with this complex agenda.

All of these initiatives (and others not mentioned here) have been prompted by the need to accelerate change in the professions, to enable them to respond fully and positively to the challenge of sustainability.

However, it is only fair to point out that, whilst significant progress has been made, the path towards the vision outlined below is fraught with conceptual and practical difficulties. To exemplify this, I have extracted some comments from a working paper of the Engineering Council in July 2000. This highlights the complexity of the inter-relationships between development, the pursuit of equity and the good of the environment.

Nevertheless, from a number of sources, there is evidence that professionals are beginning to focus and debate three overlapping themes:

- the strong sense of personal responsibility for bringing about change;
- the need for partnership and collaboration and the exchange of ideas to bring about change;
- the recognition that an understanding of ethics should be a mandatory part of the school and HE curriculum. Ethics and values lie at the heart of sustainability.

Parallel changes are taking place in business – where similar demands for greater corporate transparency are leading to new corporate social responsibility and risk related disclosures, becoming part of corporate accountability (in response to Turnbull, Cadbury, Greenberg, *et al*). This has spawned a wide array of indices and awards such as the Dow Jones Sustainability Index, the FTSE4Good and ACCA Sustainability Reporting Awards.

The place of learning

The real question, however, is how best to take this agenda forward. How can the professional institutions themselves help their members, offer guidance, training and above all direction, in this complex field?

The PP4SD project identified some of the ways in its initial considerations with its 14 partner organisations. No rocket science here – just plain common sense, walking the talk. It will be interesting to discover whether these sorts of processes and actions have begun to embed within the professional bodies. I hope so – but my instinct and intelligence network tells me differently!

Why do I say this?

First, the approach to sustainability needs to be different to the traditional forms of engagement through education and training we have all got used to through schools, colleges and universities. As many commen-

tators are now articulating, the emphasis is more on learning, dialogue, inquiry, participation and partnership. not just on teaching and transmitting information; or working to a national syllabus or curriculum, but allowing exploration of issues and problems through open-ended enquiry and learning, as part of an ongoing process.

Learning about sustainability is not time-bound – like a GCSE in history or geography. I would recommend Stephen Sterling's book, *Sustainable Education*, the most recent Schumacher Briefings (No. 6), for those of you who are interested in more details on this emerging idea and its implementation.

> ***'There is in short no direct link between engagement in Continuing Professional Development and professional competence...'***

Continuing Professional Development (CPD) has become at least notionally part of the debate about professional life for many UK professionals. A recent survey of professional associations conducted by the Professional Associations Research Network (PARN) found that of the 162 respondents, 62 per cent had developed a CPD policy and programme. However, from the limited number of surveys of their own members, carried out by associations, there appears to be a wide variation in the level of participation in CPD across professional bodies.

One of the key findings of PARN's research is the difficulty of finding appropriate CPD related to reassuring clients and the public in general that professionals remain competent throughout their working lives, again emphasising the need for a different approach to learning. There is in short no direct link between engagement in CPD and professional competence. The research concludes that the practice of CPD should not consist of a frequent series of updating or knowledge acquiring events, rather a continuous process of learning through reflection on practice.

Again, this offers us a different view of how professionals might need to learn in the context of the contemporary issues they face. The idea of 'reflection on practice' can be defined as an act of participation in a complex social learning system. One of the current gurus of learning, Etienne Wenger, has developed a useful framework for describing social learning systems. In this framework he recognises that competence is historically and socially defined. For example, if we are newcomers to an organisation, we often feel like bumbling idiots among the sages. We want to learn, we want to apprentice ourselves. We feel an urgent need to align our experience with the competence 'they' define. Their competence pulls our experience.

Sometimes, it is the other way round. We have been with a community a long time. We know the ropes. We are thoroughly competent in our own eyes and those of our peers. But something happens: we go to a seminar, we have an experience that opens our eyes to a new way of looking at the world. This experience does not fit with our home community. We return; we try and communicate our experience, what we have discovered. In the process, we are trying to change how our community defines competence, and we are actually deepening our own experience. We are using our experience to pull our community's competence along.

Whether we are apprentices or pioneers, newcomers or old timers, knowing always seems to involve these two components: the competence that our communities of practice have established over time (i.e. what it takes to act and be recognised as a competent member) and our ongoing experience of the world as a member in the context of a given community and beyond.

As the two examples demonstrate, either competence or experience can shape the other, although usually the process is not completely one-way. But whenever the two are in close tension and either starts pulling the other, learning takes place.

Wenger calls the basic building blocks of social learning Communities of Practice. By participating in these communities, we define with each other what constitutes competence in a given context; being a reliable doctor, a talented civil engineer, an astute poker player.

Hence if professional associations are to become effective Communities of Practice, they must do three things:

- keep learning at the centre of their purpose
- maintain a sense of community and mutual engagement over time
- be aware of the community's own state of development and move forward

Those three dimension work together. Without the learning energy of those who take initiative, the community becomes stagnant, without strong relationships of belonging it is torn apart. And without the ability to reflect, it becomes hostage to its own history.

Opportunities and threats

The professions are facing some difficult decisions. It is increasingly difficult for many professionals to remain at the leading edge in terms of competence, because of the increasing pace of change – sustainable development issues lie at the core of this change. The expectation levels of clients served by professionals are high in terms of competence and failure to provide 'technically', ethically or environmentally responsible solutions can frequently lead to legal claims against professionals. Hence many professional bodies are seriously considering mandatory CPD as part of membership. As I have outlined, it remains to be seen whether this is the only answer. However, there is no doubt that sustainability in all its dimensions will increasingly impinge on the decisions and actions that professionals take in the communities of practice in which they operate.

World Summit on Sustainable Development: the turning point for a better world?

The World Summit on Sustainable Development (WSSD), taking place in Johannesburg later this year, will provide a unique forum to provide the ultimate, overarching framework for the integration of trade, development, environment and social agendas so that we are better placed to tackle global issues such as poverty and environmental degradation.

Unfortunately, there is a real danger that the summit will merely present an opportunity for many nations to engage in a bewildering array of discussions relating to these issues rather than exploring the interface between them and key action that can be taken – which is where the real value of the summit lies.

The UK is preparing well for the summit and is seeking to ensure that the agenda is sharply defined to avoid this danger. However, back home, despite the creation of the appropriate infrastructure to deliver sustainable development, progress towards this goal is frustratingly slow. The latest UK quality of life indicators illustrate this point yet the Government seems determined to pretend otherwise.

These are the overall findings of the Environmental Audit Committee's latest report, as the third preparatory meeting for the summit continues in New York. John Horam MP, Chairman of the Committee said: 'There is a risk that the WSSD will not be the turning point that the world needs unless a clear, true sustainable development agenda is rapidly agreed. It is vital also that Tony Blair persuades President George W. Bush to attend. Margaret Beckett is leading the UK's effort well, but domestically our efforts are characterised by too little achievement and too much spin.'

1. We support the Government's decision to push issues such as poverty eradication and access to clean water as leading candidates for the WSSD's agenda rather than issues such as climate change and biodiversity where frameworks of action have largely been agreed. WSSD does not start with a clean sheet and it is important that these elements of the Rio process are built upon and not forgotten in the summit discussions.
2. There is a need to resolve tensions between environment and development standpoints, as displayed to the Committee by Jonathon Porritt and Clare Short.
3. We are concerned that the Department for Environment, Food and Rural Affairs is seeking to portray the latest quality of life indicators as demonstrating improvement in UK quality of life when in fact the picture is mixed. Areas such as land-use, traffic and violent crime show worrying trends.
4. We are disappointed that the UK Government's progress report for the summit is little more than a list of every UK initiative related to a social, economic or environmental policy. It contains no critical assessment of where the UK has got to in the implementation of Agenda 21 and is not the warts and all assessment that the UN is seeking.
5. The Government has put in place much of the machinery necessary to generate policies with sustainable development at their heart. However, these are far from delivering their full potential because few departments consider sustainable development to be central to their activities.
6. It is important that Ministers across Government take on a leadership role in explaining and articulating sustainable development as it relates to particular policy areas. We fully endorse the Sustainable Development Commission's suggestion that each Cabinet Minister should make a keynote speech on a sustainable development theme in the run up to the Summit.

Buying time for forests

At the Rio Earth Summit in 1992, world leaders from 180 countries recognised the damage being inflicted on a fragile Earth and agreed to adopt more sustainable policies. The Convention on Biological Diversity, designed to protect the world's threatened habitats including ancient forests and the life that depends upon them, was central to this agreement. A decade later, the world's ancient forests continue to be degraded or destroyed at an unsustainable rate.

As a signatory to the Convention on Biological Diversity (and the Convention on Trade in Endangered Species), the UK Government has supported moves to protect ancient forests and encourage the sustainable production and use of timber. The UK Government was instrumental in encouraging commitments at the G8 in 2000 to ensure Government procurement of timber from sustainable sources and launched its own domestic Sustainable Timber Initiative in the same year, committing Government departments to seek to buy timber and timber products from sustainable and legal sources. Yet, according to a recent report from Friends of the Earth, the UK remains the largest volume importer of illegally logged timber.

As the Commons Select Committee tasked with monitoring the Government's contribution to sustainable development, the Environmental Audit Committee has launched an inquiry to examine the Government's role in promoting the use of timber from sustainable sources.

The Committee will be considering in particular:

a) Government timber procurement, the Sustainable Timber Initiative, and the development of guidance on timber procurement for local authorities;
b) The implementation and effectiveness of the Convention on Trade in Endangered Species (CITES) as it relates to timber;
c) The development of the forest certification system for domestically-produced timber;
d) The development and implementation of sustainable forestry indicators; and
e) Progress made at the Ancient Forest Summit at the Convention of Biological Diversity's 6th Conference of the Parties in the Hague.

Dump less rubbish, Beckett tells councils

Environment Secretary Margaret Beckett has called on England's local councils to ensure they offer good recycling facilities, that are easy to find to help the nation become cleaner and catch up with higher recycling rates in other European countries.

Margaret Beckett said: 'Central government, local government, the community sector, private industry and the population at large, need to work together to recycle, re-use and recover the waste produced in England.'

Speaking to the annual conference of the Community Recycling Network in Birmingham, Mrs Beckett said: 'We are bottom of the league when it comes to recycling rates in Europe. That is just not acceptable. Landfill is not an option for the future. Nor is it environmentally friendly.

'I want to see England climb up the league table – we need to catch Austria and Switzerland which have fine recycling records. We need all councils in England to do what they can to provide the public with easy-to-find and easy-to-use recycling facilities. It is already happening in many parts of the country – it needs to happen in every borough.

'Only an average 11 per cent of household waste is recycled or composted in England at the moment. That's a slow start.

'Things are starting to change, but more haste is required. In a survey published by the Environment Agency earlier this week nine out of ten people said they would recycle more waste if it was made easier.'

The Community Recycling Network (CRN) promotes community waste management in the UK providing umbrella services and support for local groups.

A selection of recycling rates for municipal waste in Europe and North America

	%	Year		%	Year
Switzerland	49.7	2000	Finland	30	1997
Austria	49.7	2000	Denmark	31	1996
Germany	48	1996	Canada	29	1997
Netherlands	46	1998	Spain	20	1997
Norway	40	2000	Italy	13	1997
Sweden	34	1997	France	12	1993
USA	31.5	1998	England	11	2000-01

Kyoto Protocol ratified – and rejected

The European Union member states have demonstrated their political commitment to tackling climate change by ratifying the Kyoto Protocol, which sets targets for industrialised countries to reduce their emissions of greenhouse gases.

Environment Minister Michael Meacher said the EU's ratification of the Kyoto Protocol sent an important message to the world that it was committed to tackling climate change.

'For the UK, it means that we have made a legally binding commitment to reduce our greenhouse gas emissions to 12.5 per cent below 1990 levels by the period 2008-12. I believe the EU has worked in a particularly focused and co-ordinated manner to reach this point.

'We hope that our international partners will follow suit and ratify.'

Japan has also ratified the Kyoto agreement, but Australian Prime Minister John Howard says that Australia will not be following suit.

'For us to ratify the Protocol would cost us jobs and damage our industry,' he said.

Pollution hits the poor

The least affluent members of society tend to be exposed to the highest levels of air pollution, according to a report from the Department of the Environment, Food and Rural Affairs (DEFRA).

Environment Minister Michael Meacher said: 'Clean air is essential to quality of life. This research shows that very often the most vulnerable members of society are exposed to the highest levels of air pollution.

'Many of the measures that we already have in place to improve air quality are starting to deliver real results in urban areas. The number of days of poor air quality has fallen steadily over the last decade as emissions from road transport and industry have fallen. As local authorities start introducing their air quality action plans over the months ahead, we expect that these will deliver further improvements to quality of life in the areas affected.'

The report analyses air pollution and social deprivation datasets for four UK cities (London, Birmingham, Belfast and Cardiff), and considers the spatial relationship between air quality and social deprivation. It concludes that in three out of the four cities (London, Birmingham and Belfast), there are clear correlations between social deprivation and air pollution, with the most deprived wards being also, for the most part, those where air pollution levels tend to be highest. In Cardiff, the pattern is less clear.

Where local authorities identify air pollution hotspots, they are required to designate air quality management areas (AQMAs) and draw up action plans setting out what they intend to do to improve their local air quality.

Of the four areas studied in the report, London and Cardiff have already designated AQMAs, with Birmingham expected to do so shortly. Belfast has not yet designated an AQMA since the relevant legislation is not yet in force in Northern Ireland.

- The report, *Further Analysis of NO_2 and PM_{10} Air Pollution and Social Deprivation*, can be accessed at *www.airquality.co.uk*
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, can be downloaded from: *www.defra.gov.uk/environment/airquality/index.htm*

UK business and biodiversity: progress and obstacles

James Calow MSc(Dist) AMIEnvSc and Dr Mark McLellan

Biodiversity is a key component of sustainability, and in order to enact the UK Biodiversity Action Plan, Government encourages all sectors – voluntary, public and private – to make a contribution. Some companies have established biodiversity action plans and management programmes, but many others have yet to address the issue.

The progress and obstacles workshop was the first in a series of business and biodiversity workshops organised by Middlemarch Environmental Ltd, the consultancy of the Warwickshire Wildlife Trust, to provide a much needed exchange of experience and ideas.

The workshop took place in April at Brandon Marsh Conference Centre near Coventry, the HQ of the Warwickshire Wildlife Trust, and a wetland SSSI created by extractive industry. The aim of the workshop was to bring together key policy makers, researchers and business practitioners to focus on the following issues of biodiversity for businesses:

- barriers and benefits to business engaging in biodiversity agenda;
- integrating biodiversity into Environmental Management Systems
- producing corporate Biodiversity Action Plans.

Speakers from DEFRA, English Nature, IEMA and the Earthwatch Institute, together with large business organisations and SMEs implementing biodiversity programmes, provided an update of what has been achieved to date, highlighting examples of good practice.

Delegates were then invited to identify the obstacles for wider business participation in the biodiversity agenda and ways in which the good practice can be taken up more widely. The main presentations and findings from this workshop, together with details of future workshops, will be made available on the Middlemarch Environmental website: *www.middlemarch-environmental.com*

Minister's early warning on climate change

Environment Secretary Margaret Beckett has warned that the impact of climate change on the UK may be sharper and come sooner than expected.

Mrs Beckett said the latest report on climate scenarios went into greater detail than previous forecasts. She said: 'It's building on what we knew already from 1998, but we're getting better at talking about it in more detail and making it more meaningful, not just for the Government, but for business as a background against which they must plan for the future.

'Today's report looks a long way ahead into the 2080s, but it's telling us two key things. One is climate change will be earlier and sharper than we thought and that some of that change is already built in. We're taking a lot of action, but unless we continue to take stronger action, these are the kind of problems we will face.

'Increased risk in the UK of droughts, heavy rainfall and floods, could have major consequences for land use, planning, water resources, infrastructure, insurance, tourism and many other sectors across society.'

Top temperatures in summers in the UK may rise to highs of 40°C by the 2080s with many more 'very hot' days contrasted by wetter, but warmer, snow-free winters and drier spring and autumn seasons – most probably all triggered by global warming. Snow in Scotland is expected to be reduced in the 2080s by between 60-90 per cent according to the report. Conversely Scotland will see warmer summers.

Mrs Beckett urged British business to start planning ahead now to reduce greenhouse gas emissions, or face the possibility of insurmountable problems running a business in years to come.

She warned: 'Climate change must be factored into everyday decisions by organisations and individuals now. People must not be caught on the back foot. Even at the lower end of the range of uncertainty they will have a huge impact on all our lives.'

Mrs Beckett was commenting on *Climate change scenarios for the United Kingdom*, prepared by the Hadley Centre for Climate Prediction and Research, Tyndell Centre for Climate Change Research and the University of East Anglia.

The Environment Secretary said: 'It is clear from the report that the British climate as we know it will change significantly. Almost a century of past global greenhouse gas emissions will take their toll in the UK.

'Individuals and all parts of the UK economy, should start planning ahead now to ensure they can meet the challenges of decades to come or face serious damage to trade. The government has already started work on adaptation, which we will need to further review in the light of this research.

'We are making strong progress in reducing domestic emissions through our UK Climate Change Programme which includes initiatives such as the Emissions Trading Scheme. We estimate that these measures could mean the UK could cut its emissions by 23 per cent below 1990 levels by 2010 compared with our Kyoto target of a 12.15 per cent reduction.

'We continue to believe the Kyoto Protocol is the only way forward for international action.'

The report illustrates that the rise in the UK average sea level may further threaten some low lying unprotected coastal areas, but that it is the extremes of sea-level storm surges and large waves – that could cause most damage.

Chris Fay of the Government's Advisory Committee on Business and the Environment (ACBE) commented: 'ACBE has been exploring the significant risks and opportunities predicted changes in our weather will pose for businesses in this country. Changing weather patterns may not only affect their premises, but also their supply of raw materials or the demand for their products and services.

'To gain maximum competitive advantage from these early warnings, businesses of all kinds need to begin now to build climate change into their planning systems. ACBE will continue to work to help trade associations provide tailored advice for business sectors. SMEs in particular will need help so they can react effectively to climate change.'

Chris West, Director of the UK Climate Impacts Programme said: 'Just as weather patterns vary across the UK now, so different regions are likely to be affected differently by a change in our climate, and this will have an impact on a wide range of sectors.

'UKCIP is here to help organisations use the scenarios to assess how they will be affected.'

Launch of the Science Council

The millennium year was notable for the launch, by Science and Innovation Minister, Lord Sainsbury, of the Science Council (SC). This is a new body representing the science community and comprising most of the UK's leading science-based professional institutions and learned societies.

Under the Presidency of Sir Gareth Roberts FRS the Science Council has evolved an ambitious programme of work. Delivery of the programme will fall to four newly established groups. NICK REEVES, Chair of the 'Science in the Environment Group', explains.

The Science Council, through its member organisations, represents the interests of over 150,000 individual scientists and technologists. Currently, it is actively seeking a Royal Charter and the designation 'Chartered Scientist' (CSci). This will be a new qualification that will confer recognition for the professionalism of the science community and will also be a celebration of excellence in the application of science.

The Science Council's membership is broad based and represents almost every aspect of science and technology. And it's not just another 'talking shop'. The Science Council exists because there is a need to ensure that all science disciplines play their full part in the sustainable wealth and health of the nation. A single voice for science, supported by a programme of action centred projects, will ensure that the Science Council promotes a positive image of science to people, the media and governments; enhances the essential role of scientists in society and communicates effectively with the public, industry, academia and Government.

I don't use the phrase 'action centred' lightly. In forming four task-led groups, the Board of the Science Council was concerned that they should not only address issues of current concern but, in addressing them, deliver new thinking and solutions which are measurable and add to our knowledge for the public benefit.

The four groups are 'Science in the Environment', 'Science and Society', 'Science and Health' and 'Science and Education'. All of the constituent bodies of the Science Council are able to participate in the work of the groups which work to clearly defined terms of reference approved by the Board of the Science Council.

Each group is working on a major project that relates to current Government and/or social priorities.

For example, the Science and the Environment Group are undertaking a thorough review of environmental indicators (EIs). It has identified a need to evaluate those that currently exist, test their relevance and identify gaps. For obvious reasons the outcomes from this work will be of great value to the EA.

The scope of the Environmental Indicators project is as follows:

1) Identify which EIs are currently used by Government and its agencies to monitor the atmosphere, surface and underground waters, the oceans, soils, plant and animal ecology and those carried by humans and animals;
2) Seek the views of those who generate and use EIs on their adequacy, current applications, comprehensiveness, time range and utility, the costs of data collection, storage and manipulation, sources and security of funding; and
3) Recommend future requirements for EIs given current knowledge of the environment and future needs from a UK and international perspective.

The outputs from this project are:

1) A report to the Science Council by early 2003;
2) A conference to launch the report and discuss its findings;
3) A briefing paper for government ministers, MPs, civil servants, the media and the science community;
4) Publication of the report on the Science Council website.

Apart from undertaking project assignments, the groups are committed to developing contacts with eminent practitioners and others in the science community.

From time to time such people are invited to group meetings for an exchange of views and ideas on issues of common interest and concern. The groups are, in effect, the engine room of the Science Council and will play a key role in ensuring that the Science Council is well placed to identify and address issues of concern as well as meeting existing priorities for science and its practitioners.

Forthcoming conferences and courses

3-4 September/1-2 October
PP4SD trainers' courses
Holme Lacy College, Hereford.
Contact IES secretariat if interested.

2-6 September
Monitoring for Nature Conservation
Plas Tan y Bwlch, Wales £350
Short course to further the skills necessary for the effective monitoring of sites of nature conservation interest.
Details: The Director, Plas Tan y Bwlch, Maentwrog, Blaenau Ffestiniog, Gwynedd, LL41 3YU
01766 590324
email: plas@eryri-npa.gov.uk

23-26 September
Management Skill for Countryside, Tourism and Heritage Staff
Plas Tan y Bwlch, Wales £690
Short course to promote development for countryside managers.
Details:
01766 590324
email: plas@eryri-npa.gov.uk

24-26 September
Waste 2002 – Integrated Waste Management and Pollution Control, Research, Policy and Practice
Stratford upon Avon
The second in a series of international bi-annual conferences
Details: Conference Office,
02476 412170
email: info@waste2002.com

7-9 October
Environmental Protection 2002, NSCA Annual Conference & Exhibition, Glasgow, £247-377
Annual conference including sustainable urban management, energy and climate change, industry and environment, transport and air quality.
Details: NSCA, 44 Grand Parade, Brighton, BN2 9QA 01273 878770
email: admin@nsca.org.uk

EIA practitioner register launched

A new professional register is to be launched to recognise the skills of individuals working in the specialised field of Environmental Impact Assessment. The scheme was launched at the IEMA Annual Conference in April.

It has long been recognised that the effectiveness and quality of EIA work is largely determined by the individuals involved in the process. The new register will provide an effective means by which individuals and their employers can demonstrate to interested parties and the public that they are appropriately qualified and experienced to deal with EIA.

Simon Hewitt, Director of ERM with responsibility for the company's Environmental Planning and Development Team, said: 'There is no doubt that the EIA practitioner register will fairly rapidly become a key consideration in assessing the competence of staff in this field. I can certainly see major consultancies such as ERM taking it into account when hiring staff. I can also see clients taking it into account when evaluating tenders – when that begins to happen, consultancies will of course need to ensure that their staff are registered.'

There are three tiers to the register: Associate, Registered and Principal EIA Practitioner. The levels are aimed at all those actively involved in EIA activities from trainees through to project managers and directors.

The register will be applicable to practitioners in the UK and internationally. The scheme has already been successfully piloted in the UK, with an international pilot currently underway.

As a registered EIA Practitioner on the scheme, individuals will

- obtain professional recognition for their personal EIA skills and attributes;
- be able to demonstrate their EIA knowledge, experience and integrity to clients, regulators, local communities and other stakeholders;
- have their details placed on the registration scheme's on-line referral database;
- be able to raise the profile of their employer's EIA capabilities; and
- receive all the benefits of IEMA individual members.

The introduction of the EIA Register has been welcomed both in the UK and internationally, and from all sectors involved in EIA. Jean-Roger Mercier, Lead Environmental Assessment Specialist, Quality Assurance and Compliance Unit (ESDQC), World Bank, said: 'The EIA practitioners register is certainly an important step in the right direction. As a development agency, the World Bank is interested in any initiative encouraging the development of higher professional standards in the Environmental Assessment realm.'

Dr Ross Marshall, Environment Manager of SP PowerSystems, ScottishPower and a Full Member of IEMA added: 'Amongst EIA specialist, industry representatives and statutory bodies this will be seen as a positive step in the right direction. The recognition of professional competency can only enhance the standing of EIA practitioners internationally…

'I welcome any initiative that encourages a professional developmental framework behind EIA practice. It is a timely and bold step as the objective advice and professional opinions of EIA practitioners becomes increasingly important in ensuring that development fits its site, rather than the site fits development.'

Full details are available from the IEMA website, www.iema.net.

Route map for business sustainability

As the business community comes to understand the need to ensure its activities are not only economically but environmentally and socially sustainable, an innovative new toolkit for managers, *To Whose Profit?*, has been published by WWF and Cable and Wireless plc.

To Whose Profit? is a 'principles to practice' manual which sets out in simple language the arguments for embracing sustainability as a business imperative. It takes the manager step by step through arguments and ideas, the links with financial success and outlines potential tools and techniques that could be used to build a business case at each stage.

Forward looking businesses already understand that environmental, ethical and social factors can and will have a significant impact on their future, often with benefits to their bottom line. However some business managers have found it difficult to know where to start, how to make the connections and build a case which will win support in the boardroom. *To Whose Profit?*, written by Vicky Kemp of Loop Environmental Networks, aims to remove the mystery and the hurdles and make business sustainability a compelling goal.

'We set out to produce a working tool, one that wouldn't be read once, but used as a practical guide. To win the business sustainability argument in-house managers need to be able to present a wide range of data in a way that is acceptable and compelling to financial directors,' said Alasdair Stark, of WWF's Business and Education Unit.

According to Joss Tantraum, Business Education Manager of WWF, there is an urgent need for decisions about the environmental impacts of a business to move from the margins of operations to the boardroom:

'There is a clear shift towards businesses acknowledging and acting on their responsibility to be economically, socially and environmentally sustainable. Consumers and shareholders in particular are becoming more concerned about how the things they buy or the returns on shares they hold are produced. To stay in business managers have to look at the long-term, and act now to increase their sustainability, rather than be driven solely by a short-term profits approach.'

A sustainable business strategy will maximise opportunities such as higher productivity levels from better trained staff, gaining access to new markets through an improved understanding of consumer needs and developing an enhanced reputation that leads to greater staff, customer and investor loyalty.

WWF and Cable and Wireless plc agreed that a first step to encouraging more businesses to move along the sustainability road was to provide clear, concise information in a way that appealed to a wide range of business interests.

- To receive a free copy of *To Whose Profit?* contact Nichola Hugill at WWF on 01483 426444, or email *nhugill@wwf.org.uk*
It can also be downloaded from the WWF-UK website:
www.wwf.org.uk/towhoseprofit

The UK science and engineering research base: issues and policy

Dr John Taylor OBE FRS FREng, Director-General of Research Councils

The Director-General of the Research Councils is responsible for advising the Secretary of State on the UK Science Budget, and for overseeing the work of the seven independent Research Councils which disburse the great majority of that budget.

The sums involved in the Science Budget are considerable: some £1.7 billion in the current financial year of 2001-02, rising to £2.2 billion in 2003-04. In the UK it is used mainly to fund basic and applied research in universities and Research Council Institutes. That funding produces three key outputs: new knowledge, which in turn contributes to new technologies and capabilities; highly trained people; and the transfer of knowledge into the economy and society.

Our policy is to produce excellence in all three dimensions. That excellence of course can only come from world class science, which in turn is increasingly dependent on state-of-the-art infrastructure. The Dearing Report of 1997 identified lack of investment in this area as one of the main problems facing the science base.

That is why the Office of Science & Technology (OST) will be allocating £475 million for maintaining and improving research infrastructure over the period from April 2002 to March 2004. This will be matched by £300 million from the Higher Education Funding Council for England (HEFCE), together with £225 million from the Wellcome Trust, making a total investment of £1 billion.

The Science Budget had been stagnating (in real terms) throughout the 1980s and most of the 1990s. One of the results of this was insufficient investment in the UK's Science & Engineering Base. Today, that budget is growing by an average of 7 per cent annually in real terms, and we intend to make use of the increasing flow of funds both to ensure that our scientific researchers have access to state-of-the-art facilities, and to develop research in important new areas of science.

Current Issues for the Science & Engineering Base (SEB)

A system of the size and complexity of the UK SEB constantly throws up challenges for policy makers. This year however has seen an unusually large number of significant developments. They can be summarised as follows:

The Quinquennial Review of the Research Councils

The Government's non-Departmental Public Bodies, including the Research Councils, are reviewed every five years. This year I led such a review which concluded that all seven Councils have valuable connections with their respective communities and recognisable brand names and that it is therefore appropriate to maintain their separate identities. They nevertheless share common aims and objectives as funders of scientific research and need to be capable of acting and speaking as one. So Ministers have decided that a strategy group should be established comprising the Chief Executives of the Councils under my Chairmanship, to be known as 'Research Councils UK'. The purpose of this group will be to allow the Councils to speak with one voice on issues of common concern; to develop and implement science strategy collectively; and to secure coherent dialogue and working relationships with key stakeholders in science.

Research funding

This year has seen considerable activity in relation to Science & Engineering Base funding issues. In addition to a Cross-Cutting Review of science and research led by the Treasury, which will inform next year's Government spending round, we are in the process of thinking through a range of issues relating to how science research is funded in universities.

There is considerable evidence, not least from the Transparency Review, that university research is under-funded and that the universities have been 'over-trading' – taking on research projects at less than their full economic cost. Our goal is to create a funding system for research which is both balanced and sustainable in the long term. The decay of the research infrastructure is arguably the most obvious manifestation that the current system is unsustainable.

Growth

The Science budget will grow by an average of 7 per cent per annum in real terms across the period 2001-02 to 2003-04. This is good news, but we need to maintain the momentum. The UK's General Expenditure on R&D (GERD) is less than 2 per cent of GDP, lower than in Germany, France, Japan, and the USA. Although the SEB offers excellent value for money in terms of the quality and volume of research papers produced for every pound of investment in the science base there is ample evidence that this is unlikely to be sustainable in the long term. With the new funds now available, the Research Councils have begun successful new programmes in e-science, post-genomics, and basic technology.

There is a powerful case for increased investment in science by the full spectrum of research funders, including charities, business, and Government. OST will take the lead in presenting the case for science during the Government's next spending review, due to he completed in 2002.

The universities

We need to encourage diversity of mission. Different universities excel in different combinations and different styles of research, teaching, and knowledge transfer to the economy and to society. Our current funding system in the UK recognises and rewards research excellence (via the Research Assessment Exercise). But 75 per cent of research funding goes to only 30 universities. With this degree of selectivity it is neither realistic nor desirable for all 150 Higher Education Institutes in the UK to aspire to research excellence. Many of them however can, and do, evolve as leading-edge developers of technology, building close relationships with the business community. We should applaud these activities, and ensure they receive parity

of esteem alongside their traditional functions of teaching and research.

People

In universities it is the people – the permanent academic staff, the Principal Investigators, and the research teams – who use that infrastructure to produce the new knowledge on which our economy and society depend. Without them, no level of new investment in infrastructure is going to make any difference to the quality of the science base. Government needs to ensure that research careers are sufficiently attractive for universities to be able to attract and retain the very best talent, from anywhere in the world. Not all researchers will be able to make a permanent academic career as tenured staff, and many of them will move on to take up positions in business, the Government, and the professions. That is why the Research Councils are placing increasing importance on the training of PhD and post-doctoral students, to ensure that they develop the necessary skills to develop careers outside the university laboratory as well as inside.

Issues like these are currently under examination in the course of the Government's 'Roberts review'.

Knowledge transfer

We in Government fund scientific research not just for its own sake, but for the contributions which it makes both to the economy and to quality of life. It is consequently of paramount importance that the new knowledge developed in the laboratory is effectively transferred to the wider economy. We have a range of established schemes to encourage collaborative research. In recent years we have developed various schemes designed to facilitate particular aspects of knowledge transfer: notably the Higher Education Innovation Fund (HEIF), Science Enterprise Challenge (SEC), and University Challenge (UC).

We are developing metrics on knowledge transfer in terms e.g. of the number of 'spin-off' firms generated from university campuses and science parks, the number of patents filed, and the proportion of HEI research income derived from the business community These are useful indicators, but do not in themselves tell us the whole story.

There are many ways in which knowledge can be transferred from universities, of which one of the most important is via the supply of high quality graduates. But measuring their impact on the economy in which they go out to work is no simple task. We need to develop more robust metrics for this issue to sustain the evidence base on which the case for increased Government investment in science can be made.

Conclusion

These, then, are the main policy issues with which I deal as Director-General of Research Councils. They are collectively important to the science base, and no one issue either dominates the others, or can be considered in isolation.

No doubt other considerations will arise in the future. Whatever they are, they will be addressed within the perspective of the Government's overall priority relating to science in the UK: namely to sustain and develop our world-class capacities in scientific excellence.

■ The figures cited in this paper can be found at: *www.dti.gov.uk/ost/setstats* and further information is available from the Treasury web site at: *www.hm-treasury.gov.uk*

■ Reprinted from *Science in Parliament*, Vol. 59 No. 1 Spring 2002, with the kind permission of the publishers.

The Hon. Secretary's news desk…

Society for the Environment

At its meeting on 29th May the Steering Group for the new umbrella body for environmental institutions chose as its formal designation the title of Society for the Environment. A constitution is under discussion.

PP4SD

With the encouragement of the recently announced EAF grant, the second phase of the project staged two successful events during May.

The first was an open one-day seminar entitled 'Shape Up for Sustainability – The Professionals' Approach', and the second was another two day trainers' course for the Foundation Course presentation.

One of the papers from the seminar, presented by Professor Stephen Martin, is included in this issue of the Journal and it is hoped to provide a summary report of the whole seminar in the next issue. Further trainers' courses will be taking place at Holme Lacy College, Hereford, on 3-4 September and 1-2 October. Please contact the secretariat if you are interested in attending.

Regional activities

It is with regret that we announce that the Foundation Course was unable to take place in Scotland in June due to the limited support. We are, however, pursuing alternative options for the future.

Responses

Responses have been submitted to the following consultation documents:

• *Reform of planning obligations* (to DTLR)
• *New procedures for processing major infrastructure projects* (to DTLR)
• *Proposals for regulations on the exclusion or restrictions of access (Countryside and Rights of Way Act 2000)* (to DEFRA)
• *Rights of way improvement plans – draft guidance to local highway authorities (Countryside and Rights of Way Act 2000)* (to DEFRA)
• *Regulations on dedications of access land under Section 16 (Countryside and Rights of Way Act 2000)* (to DEFRA)
• *The Environment Agency's objectives and contribution to sustainable development: statutory guidance* (to DEFRA)
• *Review of future Government Advisory Board on Education for Sustainable Development* (to DEFRA)
• *Possible changes to the use classes order and temporary uses provisions* (to DTLR)
• *Development on land affected by contamination* (to DTLR)
• *Forestry devolution review* (to the Forestry Commission)

RAF

The EIC Guide to the UK Environmental Industry 2003

This yearbook, produced by the Environmental Industries Commission, contains a wealth of information on companies operating in the environmental field and is endorsed by the Institution.

Copies are available to Institution members at the discounted rate of £25 and a 10 per cent discount on the cost of a 'profile page' is also available.

Details may be obtained from the publishers, McMillan-Scott PLC.

■ Contact Pauline Middlehurst, Tel: 01625 667516, Email: *Pauline.middlehurst@mcmillan-scott.plc.uk*

New members

The IES is pleased to welcome the following to membership of the Institution:

Dr S.P. Anderton	Senior Hydrologist, SEPA
Mr J.K. Black	Science Officer – Air Chemistry, SEPA
Mrs G.E.M. Bruce	Waste Minimisation Manager, SEPA
Dr D.S. Cameron	Senior Hydrologist, SEPA
Miss M. Churches	Asst. Environment Protection Officer, SEPA
Mr C. Coffey	Engineer, Galway County Council
Mr D.W. Cord	Environment Protection Officer, SEPA
Miss L.J. Coull	Environment Protection Officer, SEPA
Mr G.J. Davies	Postgraduate Research Student, University of Newcastle upon Tyne
Miss A. Dolan	Assistant Landfill Manager Galway County Council
Mr S.J. Fagan	Environment Protection Officer, SEPA
Dr J. Foot	Policy Development Officer, SEPA
Dr S.F.I. Haslam	Area Support Team Officer, SEPA
Mr L. Haughton	Recent Graduate, University of Salford
Mr A.L. Hegarty	Environmental Evaluation Emissions Monitoring Manager
Mr M.P. Jenkins	Contaminated Land Officer Vale of Glamorgan Council
Mr S.J. Kirk	Asst. Environment Protection Officer, SEPA
Mr J.M. Llewellyn	Environment Protection Officer, SEPA
Dr G.G. McFadyen	Policy Development Officer, SEPA
Mr C.J. Morrow	Scientist, SEPA
Mr J.W. Nesmith	Environmental Scientist, Snowie Limited
Mr D. Philips	Scientific Officer – Air Quality Mgt Bromley Council
Miss T. Radosevic	Environment Protection Officer, SEPA
Mr D.N. Smith	Senior Environment Protection Officer, SEPA
Ms E.M. Strain	Waste Strategy Area Co-ordinator, SEPA
Ms C.F. Thornton	Environment Protection Officer, SEPA
Ms I.N. Watson	Radioactive Substances Specialist 11, SEPA
Mrs G. Wight	Environment Protection Officer, SEPA
Mr P.A. Young	Environment Protection Officer, SEPA

Diary dates for 2002

9 Sep	**GP Committee**	**13.00**
6 Nov	**Education Committee**	**10.30**
6 Nov	**Council**	**13.30**
2 Dec	**GP Committee**	**13.00**

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Waste management

- From waste to woods – planting trees on landfill
- From waste to woods: trees on landfill and their place in landscape
- Enhanced landfill strategy
- Waste minimisation: the long term benefits
- European study on EISs of installations for the treatment and disposal of toxic and dangerous waste
- Mercury fall-out from crematoria

Education and training

- Environmental courses undergo a quality assessment
- Student environmental declaration
- On-line information systems in environmental sciences courses
- Global environmental charter and network for students

Business and industry

- The tourism challenge
- The tourism debate and environmental scientists
- Enjoying environmental science as a career
- The Brent Spar and the best practical environmental option

National and local government

- Transport policy, environmental pressures and the new UK government
- Local Agenda 21 – making it work

Price: £5 per paper including p&p
(£3 per paper for members)

Contributors

The *Environmental Scientist* aims to provide a forum for members' contributions, views, interests, activities and news, as well as topical feature articles. Articles up to 3,000 words should be submitted to the Editor, *Environmental Scientist*, PO Box 16, Bourne, PE10 9FB, three weeks prior to publication in the last week of January, March, May, July, September and November.

Views expressed in the journal are those of the authors and do not necessarily reflect IES views or policy.

Advertising

Advertisements should be submitted to reach the Institution by the 7th of the month of publication.
Rates: £50 (half page); £25 (quarter page); £12.50 (eighth page). Full page adverts at £100 can only be accepted under special circumstances, subject to space being available.

Published by the Institution of Environmental Sciences, PO Box 16, Bourne, Lincs PE10 9FB. Tel/Fax: 01778 394846.
Web Site: http://www.ies-uk.org E-mail: ies-uk@breathemail.net
Design and origination by Davies Communications, 020 7482 8844.
Printed on recycled paper by Uniprint Ltd, 36 Jaggard Way, Wandsworth Common, London SW12 8SG.