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FEATURE ARTICLES

In September 2000 a second booklet was published as part of the project work for Professional Practice for Sustainable Development. For the benefit of members of the Institution and other subscribers, the main content of the booklet is reproduced here.

Professional Practice for Sustainable Development

Background

The booklet is the second in a series aiming to encourage and support the integration of sustainable development principles into professional practice. The series has been developed by participants in the inter-professional project *Professional Practice for Sustainable Development (PP4SD)* which arose out of a seminar held by the Council for Environmental Education (CEE) and the Environment Agency in March 1999.

Now in its second year, the project is facilitated by CEE, the Environment Agency, the Institution of Environmental Sciences, The Natural Step and WWF-UK. The Department of the Environment, Transport and the Regions (DETR) Environmental Action Fund and WMF-UK are supporting the project financially, with further contributions in kind from the staff and members of the participating institutions and partners. Currently 14 professional institutions are involved in the project:

- Building Services and Research Information Association
- Chartered Institute of Building Services Engineers
- Chartered Institution of Water and Environmental Management
- Chartered Institute of Purchasing and Supply
- Institute of Energy
- Institute of Waste Management
- Institution of Chemical Engineers
- Institution of Civil Engineers
- Institution of Environmental Sciences
- Institution of Mechanical Engineers
- Royal Institute of British Architects
- Royal Institution of Chartered Surveyors
- Royal Society of Chemistry
- Royal Town Planning Institute.

The booklets produced in the PP4SD series do not necessarily represent the views of the project participants, but they are all happy to be associated with them.

Who is it for?

The booklet *Developing cross-professional learning opportunities and tools* is aimed at those in professional institutions who are engaged in designing and delivering training for sustainable development. It

INSIDE THIS ISSUE

has developed out of the Professional Practice for Sustainable Development project. It is anticipated that the booklet will meet the needs of a wide audience, including independent consultants and facilitators.

What is it for?

The primary objective of the booklet is to help those developing training programmes translate ideas on sustainable development into practice. To this end, the booklet provides practical advice and support, and signposts to sources of information and materials.

Many professional institutions are already benefiting from putting sustainable development principles into practice. Others are considering how to become involved so that they might benefit. The booklet brings together information and advice for practitioners who are already offering training in sustainable development or who wish to become involved. It is structured around five themes:

1. Learning and development
2. Indicative course content and approaches to learning
3. Resources and how to access them
4. Examples of effective practice
5. Review and evaluation.

It is hoped that by following the guidance under each of these headings, practitioners will be able to build on their current position, whatever that might be.

Each theme can be approached at three levels of learning: planning and delivery, reflecting on what has been achieved and measuring the gains. The booklet contains essential information for all stages, from initial ideas through to implementation and further development:

- it provides useful background on getting started and sources of information
- it highlights workable ideas and notes possible developments
- it enables learning from examples of effective practice
- it promotes cross-professional interaction and learning.

The five themes are being explored further during the next phase of the project, with a foundation course and on-line materials being developed.

Whilst there is widespread interest in sustainable development, it will only be achieved through a range of professionals working to integrate sustainable development into their daily professional activities. This project is based on the belief that inter-professional dialogue on learning and applying sustainable development principles will support this important objective.

Sustainability – learning and development

Learning is at the heart of sustainability because of our limited understanding of the concept and how to put it into practice. This should not surprise us because for nearly 30 years, academics, policy makers and civil society organisations have wrestled with the nature of sustainability and its implications for the economy and society. Atkinson (1998)[1] provides a useful summary of the issue:

'Sustainability is an ideal end-state. Like democracy, it is a lofty goal whose perfect realisation eludes us. For this reason, there will always be competing definitions of sustainability. We know these definitions will always include the well-being of people, nature, our economy and our social institutions, working together effectively over the long term. But as the process of attempting to achieve sustainability will continuously reveal new challenges and questions – pushing back the horizons, as it were – a definitive definition is impossible. Any indicator framework, therefore, needs to be flexible and adaptable to those changing definitions. It needs to grow as our understanding grows, while continuing to serve its purpose as a simplifier and guide to complexity. It needs to maintain a trail of continuity from year to year and decade to decade. Most important, it needs to speak to people in ways understandable both to the rational mind and to the intuition.'

The PP4SD Framework

Based on this approach, the PP4SD project has developed a flexible framework for sustainability. Its main function is to ensure that the content of any learning materials developed within the project is consistent with the overall objectives of sustainability.

This framework[2] has been derived from a number of key sources, including: the Rio Declaration, World Business Council on Sustainable Development, DETR, The Natural Step, the International Institute for Sustainable Development, the World Commission on Environment and Development, Forum for the Future and Natural Capitalism.

The framework characterises/describes a sustainable society as one where:

1. Any materials mined from the earth should not exceed the environment's capacity to disperse, absorb, recycle or otherwise neutralise their harmful effects to humans and the environment.
2. Synthetic substances in their manufacture and use should not exceed the environment's capacity to disperse, absorb, recycle or otherwise neutralise their harmful effects to humans or the environment.
3. The biological diversity and productivity of ecosystems should not be endangered.
4. A healthy economy should be maintained, which accurately represents the value of natural, human, social and manufactured capital.
5. Individual human skills, knowledge and health should be developed and deployed to optimum effect.
6. Social progress and justice should recognise the needs of everyone.
7, There must be equity for future generations.
8. Structures and institutions should promote stewardship of natural resources and the development of people.

It will be obvious from this approach that the PP4SD project draws a clear distinction between **sustainability** and **sustainable development. Sustainability** is the capacity for continuance into the long-term future, whereas **sustainable development** is the process of moving towards this ideal end-state.

Professional Practice	Framework Principle 1 Issue – Fossil Fuel Use	Framework Principle 6 Issue – Poverty
Political	International Instruments eg: Kyoto Protocol; global emissions targets; Joint Implementation and the Clean Development Mechanism (CDM); EU targets; White Paper on Renewable Energy. National Instruments eg: Marshall Task Force on Industrial Energy Use.	International Instruments eg: United Nations Development Programme – Human Development Report, 1998; Eliminating World Poverty, 1997; White Paper Principle 1: The Rio Declaration, 1992
Economic	Economic instruments; emissions trading; energy tax; ecological tax reform; carbon management.	Poverty reduction programmes and national economic development strategies; trade reform; environmentally damaging subsidies; ecotourism.
Social	Climate change and basic human needs; famine; floods; water supply; health; education; travel; employment.	Meeting basic human needs; education and extension programme; primary health care; promote urban centres that improve employment, shelter, health and sanitation
Technological and pollution control	Alternative energy use: biofuels, photovoltaics, etc. Energy efficiency: integrated transport; business and domestic energy use.	Technology exchange; forestry management/health programmes.
Legal	Emissions trading – regulation; Multilateral Environment Agreements; vehicle exhaust emissions; EU regulation on ozone depleting substances.	Enforcement of regulatory instruments – on forestry, emissions standards, pollution and biodiversity.
Environmental	Greenhouse gases: CO_2; NOx: water vapour. Climate change – the scientific case.	Consumption patterns; living planet index; population growth and habitat shrinkage.

Indicative course content and approaches

Applying the framework

The framework can be used flexibly to identify and map the range and depth of material to include in a programme of learning on sustainable development. It illustrates the dilemma of how to develop and reach an acceptable quality of life using materials and energy for a growing population whilst being able to decrease society's harmful physical impact on nature. The framework is also set in a *future* perspective and therefore offers a useful tool to help describe the gap between our present situation and the standards required for sustainability.

Using the framework for learning

A simple way of using the framework is to create a two-way matrix, setting the eight principles of the framework against the professional context in which the principles might be applied. The examples, used in the table above, are based on two major contemporary issues, namely the use of fossil fuels (linked with climate change) and poverty.

The 14 professional institutions involved in this project have also developed an indicative list of themes, content and concepts which they believe are important for all professional bodies to know about, not necessarily in detail, but at a broad level (these are set out in the Appendix).

From such lists, it is possible to identify key learning outcomes, which again can be mapped against the PP4SD framework principles. For example:

Framework principle 5
Key learning outcomes

- Understands the historical context of sustainable development (e.g. World Conservation Strategy, 1980; Our Common Future, 1987; current progress, such as consumption patterns/living planet index).
- Develops sustainable development through key scientific and ethical concepts (e.g. laws of thermodynamics; Universal Declaration of Human Rights).
- Understands the behavioural changes required to implement sustainable practices (e.g. value judgements; basic human needs; leadership and change management).
- Understands many sides of a complex issue, to resolve conflict and achieve consensus (e.g. risk analysis; complexity and systems thinking).
- Develops new ways of assessing future scenarios.

Developing sustainable professional practice

The process of integrating sustainability thinking into all aspects of a profession is a substantial and challenging task. It requires broad consultation with, and involvement of, members at all levels, as well as with other institutions and employers. The process is also one that needs to allow all members to get up to speed on what is a relatively new issue. That is why the PP4SD project has initially focused on developing and identifying resources for Continuing Professional Development (CPD).

A range of activities and approaches are available to meet these needs. They include:

- **Continuing Professional Development.** This includes Initial Professional Development (IPD). While younger members who have graduated in the past five years may have been exposed to sustainability thinking as part of their degree courses, the vast majority of professionals will have had no formal education on the subject.

  PP4SD is developing a one-day foundation course explicitly designed for professionals, and a range of institutions are developing practice-specific CPD to complement this.

  Sustainable development is about:
  - 'joined up' and integrated thinking
  - good management
  - efficient use of resources
  - good science
  - social responsibility.

  All of these themes need to permeate the three parallel strands of CPD, namely:
  - generic or foundation programmes common to all professions
  - cross-professional programmes that are sector or issue-based; and
  - programmes that are specific to a profession.
- **Conferences and exhibitions** provide an obvious route to exchange ideas and information, as long as the content is sufficiently relevant and up-to-date to draw viable numbers of participants. Many institutions have developed and run several courses on the environment and are beginning to hold conferences and exhibitions on sustainability that aim to be both practical and visionary.
- **Reports and inquiries** allow new ground to be broken. For example, the Institution of Civil Engineers produced the *Sustainability and Acceptabilily in Infrastructure Development*[3] report in response to the then Secretary of State for the Environment's challenge to all those with a part to play in the provision of infrastructure – to make it more sustainable and socially acceptable. The Royal Society of Chemistry has issued a series of technical notes on *Sustainable Development and the Professional Chemist* which can be accessed at the society's www.rsc.org website. Another example is *The Engineer of the 21st Century Inquiry*[4].
- **Books and guides** are useful once best practice has been defined. Examples include The Institute of Energy's *Good Energy Manager's Guide*[5], and signposting guides such as BSRIA's *Sustainable Construction – A Resource Guide*.[6]
- **Learning networks** can help develop competency in sustainable development. For example, the Association for Management Education and Development (AMED) is a professional network for people involved in individual and organisational development: AMED has several special interest groups including a Sustainable Development Network (SDN). Visit their web site at www.amed.management.org.uk. The Royal Society of Chemistry has established a Green Chemistry Network based within the Department of Chemistry at the University of York. It aims to promote awareness of sustainable development in industry, academia and schools.
- **Open learning** allows members to maintain their understanding, by studying out of work hours. For example, The Institute of Energy has a detailed Energy and the Environment module in its *Training in Energy Management by Open Learning* (TEMOL) programme.
- **Committees and working groups** provide a forum within an institution for discussion, debate, policy development and action planning. For example, the Engineering Council has established a Sustainability Working Group with wide-ranging terms of reference. Many institutions already have a committee that covers environmental issues. However, these groups are often under-resourced. A few of these committees are starting to address sustainable development, and the strategic nature of the topic means that these groups must achieve the right level of influence.
- **Recognition of achievement** can be a powerful driver for change. For example, The Institution of Civil Engineers awards the Edmund Hambly Medal for the creative design of an engineering project that makes a substantial contribution to sustainable development. A more integrated approach is adopted by the Royal Institute of Town Planning, who take sustainable development objectives into account when assessing their annual Awards for Planning Achievement.
- **Key Performance Indicators** can be used to ensure a defined level of sustainability performance for both individuals and projects.
- **Policies, codes of conduct and professional standards** can be adapted to include appropriate requirements for sustainability performance.
- **Journals and magazines** allow for a drip feeding of ideas and examples on what best practice in sustainability means for each profession. A sustainability in practice column could be introduced.
- **Inter-professional activities** are where there is often the most need for co-ordination on environmental and social issues. Sectors such as construction involve many different professions and solutions will only arise if these groups can work together. In 1999, The Royal Institution of Chartered Surveyors produced a report called *Property Professionals and Sustainable Development*, which outlined a need for institutions to clarify to members their position on sustainable development. The survey also concluded that many professionals, despite already tackling sustainable development issues, do not feel they have the skills or information to do justice to these new tasks and would welcome assistance from their professional bodies.

Course specification

The learning materials which are being designed for use by inter-professional groups, have been based on a range of general criteria drawn up by the professional institutions as part of the PP4SD project. Examples of these criteria are set out below (in no particular order

of priority). Learning materials should:

- have clear aims, objectives and outcomes
- add value for the institution, member and employer
- be compatible with different CPD formats and requirements
- be realistic and 'do-able'
- be relevant to the professions
- be accessible in terms of content, time, money and location
- achieve cost recovery where necessary
- be desirable or marketable to individuals, employers and institutions
- provide a balance between generic and specific
- be credible
- be able to be integrated or stand-alone
- be regularly reviewed
- use a 'development' or 'learning' approach – not just 'training'.

The professional institutions also emphasised the following approaches when developing other learning materials, specific to individual professions.

Learning materials should:

- place an emphasis on practical guidance for individuals
- use clear and jargon-free language
- include best practice guidance, tools and case studies
- tackle some topics in a multi-disciplinary context, by involving people from different professions
- be based on a generic foundation course, with supporting information for on-going learning.

The professional institutions support the idea of creating an inter-professional focus to enable more co-operation in the development of sustainability learning materials, the sharing of good practice and inter-professional working on key issues. There is also interest in the development of an inter-professional web site to share learning and developments and remain connected – because we are all part of the same system.

Approaches to teaching and learning

As far as possible any approach to sustainable development needs to encourage individuals to internalise the general principles set out in the PP4SD framework, and to work out for themselves the implications and applications, as they relate directly to their own professional activities.

Action orientated workshops which apply the principles to specific projects (e.g. construction projects, or products and services), help to create understanding and ownership of the solutions.

It is important to stress the systems perspective of sustainability. Systems theory and systems thinking are vast fields of study.[7] Systems thinking is *'a discipline for seeing wholes, recognising patterns and interrelationships, and learning how to structure those interrelationships in more effective and efficient ways'*[8]. This way of approaching sustainability is being used to develop the foundation course for inter-professional groups. Such an approach encourages us:

- to look at the earth as a system and our part in it
- to look at the organisations and resource flows of which we are a part, as systems
- to understand how a system is made up, its structure, and how we can influence and predict events.

Resources and how to access them

It is not the intention of the booklet to provide a definitive list, merely to signpost a range of relevant resources for the professions.

The following sources have been looked at by members of the participating institutions and are recommended (NB: all web site addresses correct at time of the booklet going to print):

Applying Sustainable Development *(www.applysd.co.uk)* is a non-commercial web site with the central theme of social and cultural change, which is essential for achieving sustainable development. The focus is to help individuals learn, groups to work effectively and organisations to re-examine their values, strategies and culture. New material and modifications can be found on the web site, which is updated regularly. The subjects included are:

Taking initiatives

- Agenda for change
- Practical examples
- Skilled people who can help

Making change happen

- Models for change
- Leadership
- Ethical investments

Finding information

- Books, publications, journals and reports
- Organisations working for sustainable development
- A to Z of sustainable development.

The web site provides over 300 links to other sites and cross-referencing between pages on the site.

The Environment Council *(www.the-environment-council.org.uk)* is an independent charity promoting effective dialogue and collaborative approaches to find sustainable solutions to environmental issues. They run training events on the skills involved in mediation and provide experienced mediators who can work with clients to find solutions.

Global Action Plan *(www.globalactionplan.org.uk)* started with *Action at Home*, a six month programme to help individuals change their lifestyles in terms of waste, energy, water, transport and shopping. Several organisations provide their employees with these action packs at reduced rates. More recently *Action at Work* has been developed to focus on how organisations can make changes such as waste reduction, energy use, transport policies, water consumption and purchasing. A third programme, *Action at School*, involves children and is intended both as an educational tool and a practical resource, helping the school to become more sustainable. A fourth programme, *Small Changes*, is for use in poor communities and is designed with their special needs – to improve quality of life and save money – in mind.

The Natural Step *(www.naturalstep.org.uk)* was first established in Sweden by Karl-Henrik Robert, a cancer researcher. The approach has spread to seven countries including the USA and the UK. In the UK it

is managed by the charity Forum for the Future, under the Chairmanship of Jonathon Porritt, as a distinct component of their solutions-based approach to sustainability. The Natural Step framework is based on four essential conditions which must be met if we are to achieve sustainability. In the UK, The Natural Step works with a network of organisations who want to go beyond the basics of sustainable development.

New Academy of Business *(www.new-academy.ac.uk)* has been established at the University of Bath with an office in Bristol and is supported by Anita Roddick of the Body Shop. Among other things it runs an MSc course in Responsibility and Business. The course addresses the challenges that face managers who seek to integrate successful business practice with concern for social, environmental and ethical issues.

Rocky Mountain Institute (RMI) *(www.rmi.org)* is the organisation founded by Amory and Hunter Lovins in Colorado, USA. They are co-authors of Factor Four with Ernst von Weizsacker, and co-authors of Natural Capitalism with Paul Hawken. RMI provide services that relate directly to the principles described in both books, focusing on substantial improvements in resource efficiency.

SustainAbility *(www.sustainability.co.uk)*, John Elkington's consultancy, invented the idea of the 'Triple Bottom Line'. This is in response to the challenge that companies face to 'enhance economic prosperity, ensure environmental protection and promote social justice'. More information is provided in the SustainAbility publication *The CEO Agenda*. In a recent article John Elkington states that the important priority for organisations is culture change and that this would be a central thrust for the work of SustainAbility in future.

The World Business Council for Sustainable Development (WBCSD) advocates 'balancing the 3Es'. They say, 'sustainability is about balancing three elements of a triangle, environment, economy and everyone'. They go on to describe two ways of doing this: the compromise position, in the middle of the three elements, which they dismiss as 'inherently unstable', preferring instead three points of balance, one at each corner. Many large companies now accept this idea in their Corporate Environmental Reports and some in their Annual Reports. More information can be found in the March/April 1999 issue of *Tomorrow* magazine, each issue of which contains a WBCSD Supplement.

The Wuppertal Institute for Climate, Environment and Energy is based in the North Rhine/Westphalian Science Centre, Germany. Ernst von Weizsacker, the Institute's President, is co-author of *Factor Four* with Amory and Hunter Lovins and recently became a member of the Bundestag (federal assembly) of Germany. The Wuppertal Institute provides services that include the principles of resource efficiency described in *Factor Four.* This book has been widely acclaimed because it sets out so clearly how resource productivity can be improved fourfold and demonstrates that the technology for this is already available.

To the Heart of Sustainability is a management development programme for sustainable development, run jointly by WWF-UK *(astark@wwfnet.org)* and the Centre for Human Ecology *(hos_info@clan.com).* Taking a unique approach, the programme exposes company managers to leading edge thinking on sustainable development and then encourages them to make the links to their own business situation. Programme facilitators support participants to develop an agreed plan for action, and signpost participants to other programmes and resources where required.

These are some of the practical ways in which large and small companies, as well as public sector organisations, can seek help to face the challenge of sustainability. The professional organisations listed above each have a distinct approach. To cover the full spectrum of sustainable development – a large and complex subject – will require a systemic approach using resources drawn from various places.

Other sources of information

- *A better quality of life: A strategy for sustainable development for the United Kingdom.* Cm 4345, ISBN: 0 10143 529, £11.80 or full text is at: *www.environment.detr.gov.uk/sustainable/quality/life/index.htm*
- Hawken, P, Lovins, A B, Lovins, L H (1999) *Natural Capitalism. The next industrial revolution* Earthscan. In book form, or summary article can be found at: *www.rmi.org/store/p385pid2105.asp*
- A sustainable development principles database can be found at: *http://iisd.ca/sd/principle.asp*
- Arnold, M B and May, R M (1998), *The Next Bottom Line – Making Sustainable Development Tangible.* World Resources Institute, Washington DC. A useful range of frameworks, tools and success stories for the business audience
- Lyons, K (2000) *Buying for the Future* Pluto Press (in association with WWF). This addresses the practical issue of sustainability and the supply chain
- de wit, R H Hekman, J F et al, (Editors) *Creating Tomorrow's Business – research into the management of sustainability.* ISBN: 9 07494 905 3 'le manageur' Rotterdam
- Porritt, J (2000) *Playing Safe: Science and the Environment* Thames and Hudson. A discussion of some contemporary issues, including climate change and genetically modified organisms (GMOs). It has two chapters on risk assessment and the science of sustainability
- The Institute of Chemical Engineers has an international web conference underway at: *www.sustainability2000.org*
- A huge array of general sustainable development education information is available at: *www.starfish.org*
- The World Business Council for Sustainable Development Sustainable Business Challenge Exam can be found at: *www.foundation.no/*
- Electrolux have an online course called Eco Know How. Visit: *www.electrolux.com* (in the Environment section)

- An organisation that specialises in sustainable development training for midcareer professionals is Leadership for Environment and Development. It can be found at: *www.lead.org*
- Sustainable Development: Education for Engineers & Others is a web-based course at: *www.sustainability.com/orcad/sdeng/intro.htm*
- The HE21 project has developed curriculum specifications for sustainability in relation to business, engineering and design at undergraduate level. Find it at: *www.he21.org.uk*

Examples of effective practice

The transition from strategic aspiration to implementation of sustainable development requires a huge shift in values and beliefs within any organisation. For this to be accomplished requires a range of factors, including enlightened leadership willing to promote and support learning through the organisation. In only a very few cases have organisations begun to address the professional development of their staff, focusing on learning, their personal values, as well as a review of business practice, purpose, vision and values.

Examples include:

- Interface Europe Ltd *(www.interfaceinc.com)*
- The Co-operative Bank *(www.cooperativebank.co.uk)*
- Shell *(www. shell.com)*
- Carillion *(www.carillion.co.uk)*

The training approaches adopted by such organisations have been varied and generally have not yet been fully evaluated. Some of these approaches have already been covered in previous sections. Some of the more advanced training materials and approaches are listed below:

Sustainability Training Pack – for Local Authority Officers (1999)
WWF-UK/LGMB. ISBN 1 85850 109 1
Framework for Sustainability - Training Manual
(2000) The Natural Step, UK
Framework for Sustainability - Introductory Course
(1999) The Natural Step, Australia
Implementing Sustainability - Advanced Course
(1999) The Natural Step, Australia
Sustainability Training Pack – for Elected Members (1996)
WWF-UK/LGMB, ISBN 0 74889 714 3
Dialogue on the Environment
(1996) Volvo Car Corporation

Review and evaluation

Performance review and evaluation systems have grown over the past decade, although not always helpfully in the context of sustainable development. The focus has tended to be on measuring performance and value for money, whereas process indicators and achievement of goals have tended to be neglected. In order for the goals of sustainability to be achieved, it is important that monitoring and evaluation are at the centre of any planning strategy. Learning about the progress being made is then embedded in the principle arteries of sustainable development. Judgements can then be formed about the value of any achievements, and the direction and cohesion of the learning process sharpened.

The approaches in the booklet should attempt to incorporate reflection upon the purposes and conditions of evaluation. Sustainability should then build in new forms of progression in learning or innovative approaches to inter-professional planning. During the next phase of PP4SD, the programme management group will address the question of how review and evaluation can be built into course planning and implementation.

Key questions include:

1. **Reflection on progress:**
   What did we achieve?
2. **Comparison:**
   How does it compare with our targets?
3. **Evaluation:**
   How well are we doing?
   Why have we achieved/failed?
4. **Judgements:**
   What more should we do?

Footnotes

1 Atkinson, A (1998) The compass of sustainability: Framework for a comprehensive information system. Version 1.
2 The link between the first three principles and the laws of conservation of energy is described in Porritt, J. (2000) *Playing Safe: Science and the Environment* Thames and Hudson (pp94-104).
3 *Sustainability and Acceptability in Infrastructure Development. A response to the Secretary of States Challenge* (1996) Institute of Civil Engineers.
4 *The Engineer of the 21st Century Inquiry. Engineers for Sustainability* (July 2000) Forum for the Future,
5 Boutall, T (1995) *Good Energy Manager's Guide* Management Charter Initiative.
6 Gomez, S *el al* (1999) *Sustainable Construction – A Resource Guide to Potential Pressures on the Building Services Industry.*
7 The main characteristics of systems thinking emerged in several disciplines during the first half of the century. Systems thinking was pioneered by biologists, who emphasised the view of living organisms as integrated wholes. It was then further enriched by the new sciences of ecology and quantum physics.
8 Senge, P (1990) *The Fifth Discipline: The Art and Practice of the Learning Organisation,* Century, London.
9 *Supporting sustainable development through educational resources: a voluntary code of practice* (1999) CEE/DETR/DfEE.

■ *Professional Practice for Sustainable Development Book 2: Developing Cross-Professional Learning Opportunities and Tools (ISBN 1 85850 178 4) is available from the Institution of Enviromental Sciences, PO Box 16, Bourne, Lincs, PE10 9FB.*

Designating Air Quality Management Areas in the UK: process and progress to date

Nicky Woodfield MSc, BSc, MIEnvSc

Across the UK, local authorities are in the process of completing their first phase of local air quality review and assessments. Emerging from this first phase is a suite of Air Quality Management Areas (AQMAs), differing in their spatial extent, temporal dimension and shape. Perhaps most interesting is the disparity between certain large urban authorities apparently not identifying hot spots and locations where specific objectives are to be breached, and some smaller, more rural authorities, that are indeed identifying hot spots and thereby declaring AQMAs. With subsidiarity underpinning the process of local air quality management, local decision making is influencing the outcome of the management process.

Local government air quality responsibilities

Local government in the UK is responsible for the implementation of the Local Air Quality Management elements of the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (DETR, 2000). Following the first phase of a scientific review and assessment process, local authorities have a duty to declare Air Quality Management Areas (AQMAs) in locations where specific air quality objectives are predicted to be exceeded by future target dates. The Air Quality (England) Regulations 2000, and the equivalent Welsh and Scottish regulations, specify air quality standards for seven pollutants (nitrogen dioxide, carbon monoxide, lead, particulates, benzene, 1,3-butadiene and sulphur dioxide). Local authorities in England, Scotland and Wales have a duty to work towards achieving air quality objectives (AQOs) based upon the seven health-based air quality standards. These objectives allow for consideration of cost and benefit, and the feasibility and practicability of moving towards these standards.

The official declaration of AQMAs is a statutory requirement, and the emerging process of determining AQMA boundaries is variable. Some authorities, for example, anticipate declaring a much larger area than that defined by the scientific assessment process of identifying areas of AQO exceedences, and some authorities are anticipating designating their whole authority as an AQMA. Methods for determining the exact boundary of an AQMA are also highly variable, with some authorities choosing to use administrative boundaries, and others choosing physical boundaries and features, such as roads, railway lines and rivers. Various local factors, including the local authority political regime, may influence AQMA boundary decisions, and such factors may impact on the overall effectiveness and implementation of measures within an Air Quality Action Plan, to subsequently deliver improved local air quality.

Progress with declaring AQMAs in the UK

The overall time scale for the conclusion of the first phase review and assessment work has been lengthened somewhat over the past twelve months. Initially, local authorities were advised to conclude their air quality review and assessments by December 1999, with the anticipation that any necessary air quality management areas would be identified and designated by spring 2000. This first official deadline proved difficult for local authorities across the UK to meet, with less than 10 per cent having concluded their assessments by the end of December 1999. One difficulty was the intention of the government to provide new technical and general guidance in the spring of 2000, together with a revision of the national Air Quality Strategy, which caused many authorities to delay their more complex assessment work. Added to this was the difficulty for some authorities in obtaining necessary monitoring equipment, and for some the sheer complexity of the assessment process and resulting resources required were further demands resulting in a delay in completing the first phase assessment work.

A second official deadline for first phase assessment completion arrived at the end of June 2000, by which time approximately 15 per cent of local authorities had formally concluded their first phase work. Two authorities had officially declared AQMAs, and at the end of June 2000 a further 21 authorities anticipated declaring AQMAs.

Central government, determined to ensure that the momentum underway in the process was maintained, set a third and final official deadline for local authorities, requiring the assessment work to be concluded by December 2000. Following the identification of areas of predicted air quality objective exceedences, local authorities are advised to undertake a period of four months for formal consultation prior to for the formal designation of AQMAs. With this in mind, the government anticipates most AQMAs being officially declared in Spring 2001.

By early December 2000, approximately 44 per cent of local authorities in England, Scotland and Wales had officially completed their first phase of air quality review and assessment work. Of these authorities, approximately 45 authorities (11 per cent of all English, Scottish and Welsh local authorities) had identified potential locations where AQO exceedences are predicted. Thirteen individual authorities had officially declared AQMAs, mainly for nitrogen dioxide and particulates. Even within this small set of local authorities

declaring AQMAs, various interpretations of the scientific assessment outcomes, and subsequent decision-making following consultation has resulted in a variety of AQMA outcomes.

At the beginning of January, 66 per cent of authorities had concluded their assessments, and the current figure at the end of January is 75 per cent. With almost half of all local authorities in England, Wales and Scotland having submitted a detailed Stage 3 report, almost half of these authorities are intending to declare AQMAs, which amounts to just under 25 per cent of all authorities in the UK (not including Northern Ireland) declaring AQMAs in the months ahead.

Emerging AQMAs in the UK

To date, eighteen authorities have officially declared AQMAs, which includes a Scottish authority, two Welsh authorities, four English authorities with the remainder being London Borough Councils. Seven local authorities have taken the precautionary approach of declaring the whole authority an AQMA, thereby reducing the potential risk of failing to identify any locations of public exposure to predicted AQO exceedences. Of the 18 authorities declaring AQMAs to date, 17 authorities have declared their AQMA(s) as a result of traffic-related emissions, and industrial sources are responsible for the remaining authority.

As perhaps anticipated, predicted exceedences of the NO_2 annual objective underpin AQMAs within the 17 authorities declaring as a result of traffic. Exceedences of the PM10 24-hour objective are also anticipated within seven of these authorities, and the one remaining authority for which industrial sources are responsible for the predicted exceedences. In the vast majority of cases to date, the areas of predicted PM10 exceedence are smaller than that of NO_2. A further 80 authorities currently anticipate declaring AQMAs in the next few months, of which almost 30 per cent of authorities require AQMAs for NO_2 alone, almost 60 per cent for both NO_2 and PM10, and two authorities for PM10 alone. Just over 10 per cent of authorities anticipate AQMAs for SO_2 in their authority.

AQMAs anticipated – politics meets science

Research underway at UWE, Bristol is studying the way in which local authorities are attempting to designate AQMAs, through both officer questionnaire surveys and appraisal work, focused specifically upon those local authorities who, on concluding their first phase air quality assessment work, have predicted potential AQO exceedences. Such authorities have a duty to designate AQMAs, where exposure to predicted AQO exceedences might be prejudicial to public health. The research includes a specific review of the emerging spatial extent of anticipated AQMA(s) and specific boundaries being used. Local authority officers are also asked for their perception of, amongst other criteria, the likely influences in the AQMA decision-making process, AQMA concerns amongst colleagues and the scientific assessment underpinning the designation of AQMAs.

In conjunction with the survey work, appraisals of the final stage local air quality assessments is underway to consider, amongst other criteria, how the treatment of modelling uncertainty and other uncertainty is taken into account in identifying areas of AQO exceedences, and also in delineating AQMAs. The appraisal work also considers the mechanisms used to present the outcomes of the assessment process, and includes a judgement as to the thoroughness of validation and degree to which a precautionary approach is taken. The findings reported here are from observations from a sample of 52 UK local authorities anticipating declaring AQMAs.

Anticipated AQMA spatial extent and boundaries

From a study of 52 authorities (which includes district, unitary, and metropolitan authorities from London, England, Scotland and Wales), Table 1 below indicates that one in three authorities are likely to designate AQMAs larger than the actual AQO exceedence areas identified, and one in four anticipate encompassing the whole local authority area in an AQMA. The use of physical boundaries are anticipated more so than administrative boundaries (other than borough boundaries) in delineating AQMA(s), and both the AQMA spatial extent and boundary used by an individual authority is anticipated to influence decisions in neighbouring authorities in almost a third of authorities surveyed.

Table 1. Anticipated designation (spatial extent and boundaries) of AQMAs in the UK

AQMA Spatial Criteria	**Yes**	**No**
Designate exactly where AQO exceedances are predicted?	16%	75%
Designate close as practically possible to AQOE area?	33%	57%
Designate a smaller area than AQO exceedance area?	4%	86%
Designate a larger area than AQO exceedance area?	35%	55%
Designate whole authority?	20%	71%
AQMA Boundary Criteria	**Yes**	**No**
Local Authority Ward boundaries?	6%	84%
Administrative boundaries?	4%	86%
Physical boundaries (roads, embankments, railway lines etc)	24%	67%
Mixture of boundaries?	6%	84%
AQMA spatial extent/boundary influenced by other authorities?	30%	61%

9% of authorities surveyed made no response to questions above

When asked to consider the likely influences on the AQMA decision-making process, over half of officers surveyed considered the need to address local traffic congestion to be the strongest influence in determining the spatial extent of the AQMA. Over a third of authorities considered the intention to improve the environ-

mental profile of an authority was a factor in influencing the decision making process, as illustrated in Table 2. Pressures are, within some local authorities, being exerted by individual businesses and interested parties to have their property included within proposed AQMA(s) so as to ensure their involvement in subsequent local air quality action planning processes. Conversely, within other local authorities, pressures to not include specific locations, properties and receptors are emerging as influences in the potential shape, extent and use of boundaries for delineating local AQMA(s).

Table 2. Influences in AQMA Decision-Making in the UK

Decision-Making Criteria	Yes	No
Local economic stability?	24%	59%
Potential for local regeneration?	18%	65%
Employment prospects within the authority?	6%	77%
Improve environmental profile of authority?	28%	55%
Political Party and/or new Cabinet style government?	31%	51%
Relations with local industry?	4%	78%
Local need to address traffic congestion?	51%	32%
Local electorate pressure to declare?	14%	69%
Local electorate pressure NOT to declare?	4%	78%

13% of authorities surveyed made no response to questions above

When asked to consider specific concerns raised by colleagues, with respect to declaring AQMAs, the potential impact of any such designation on planning blight was identified by almost four in five authorities, as indicated in Table 3 below. Property blight was the main concern demonstrated during workshops provided in various regions of the UK over the course of the 2000 (Woodfield, 2000[2]). The scientific uncertainty of tools, particularly for advanced dispersion modelling tools, used for air quality assessment and prediction is also a concern of the colleagues of those undertaking the assessment process.

Table 3. Concerns with respect to potential AQMAs raised by internal colleagues

Potential Concern Criteria	Yes	No
Possible blight of properties?	78%	16%
Financial implications of declaring?	55%	39%
Scientific uncertainty of tools?	59%	35%
Process for EHOs only?	16%	78%
Complexity of process?	37%	57%
Apparent lack of robustness of process?	20%	75%
No concerns?	4%	90%

6% of authorities surveyed made no response to questions above

Of the officers surveyed, three quarters considered the scientific assessment process to be sufficiently robust for the declaration of AQMAs, although only half felt that the guidance provided was sufficient for air quality assessment process, and over half considered the scientific process to be under-resourced.

Table 4. Consideration of the Scientific Assessment Process

Scientific Assessment Criteria	Yes	No
Sufficiently robust for the authority to declare an AQMA(s)?	75%	22%
Sufficient guidance provided to undertake scientific assessment?	49%	47%
Sufficiently resourced to undertake scientific assessment?	43%	53%

3% of authorities surveyed made no response to questions above

The role of uncertainty in declaring AQMAs

The vast majority of authorities requiring AQMAs have predicted exceedences of the air quality objectives using a combination of modelling and monitoring techniques, accounting for 94 per cent of the authorities responding to the survey to date. Most have adopted a precautionary approach in identifying both AQO exceedance areas and delineating AQMAs, taking into account, for example, variable meteorological circumstances, assumptions of modelling input data and variable street topographies.

Preliminary observations indicate that most designated AQMAs are to be based upon predictions derived from the use of advanced modelling techniques, with very few authorities basing such predictions on monitored data alone and the subsequent use of correction factors to predict future concentrations. Most authorities have addressed modelling uncertainty, using a wide variety of techniques including Monte-Carlo Simulation and Root Mean Square techniques. However, there is, as expected, a wide spectrum of treatment of uncertainty, with techniques differing between the various consultants undertaking modelling work for local authorities across the UK. Indeed the treatment of uncertainty has come under increasing scrutiny as authorities explore the need to delineate AQMA boundaries from modelling outputs, and as a consequence of this, various approaches have been applied to the use of uncertainty for determining the extent and shape of AQMAs.

Of the assessment appraisals undertaken thus far, many local authorities have used standard deviation, and more specifically +/– 2SD to inform an AQMA boundary, with similar numbers of local authorities using an arbitrary _X% _X_gm^{-3}. The methodology for determining AQMA boundaries as discussed in the National Society for Clean Air's Guidance on declaring AQMAs (NSCA, 2000) has been used to delineate proposed AQMAs by almost one in four authorities surveyed.

Conclusions

Various approaches in identifying locations of predicted AQO exceedences and the subsequent designation of AQMAs are emerging as the first phase of the assessment of local air quality draws to a conclusion in the UK. With between 100-130 AQMAs anticipated, of which less than approximately 15 per cent are officially declared, the process of AQMA official designation is in its infancy. However, early indications suggest wide variation in the spatial extent of AQMAs, irrespective of the extent of public exposure to predicted AQO exceedences, and as a consequence of differing interpretation of largely modelling outcomes and use of uncertainty. Various influences on the designation process are emerging, reflecting the importance of local decision-making, and demonstrating how the perception of AQMAs impacts on local planning process may in fact influence the physical nature of AQMAs to come.

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Woodfield N.K. (2000). *Air Quality Management Areas in the UK: Workshop Outcomes* (April-November 2000) *(http://www.uwe.ac.uk/aqm/centre/AQMAs/workshop.html).*

National Society for Clear Air (NSCA, 2000). *Designating Air Quality Management Areas,* NSCA, Brighton. February 2000. This work is part of a five-year programme of research investigating the evolution of the LAQM process, which intends to examine the scientific assessment process and political decision-making processes involved in declaring AQMAs in the UK.

Acknowledgments

Thanks to Clare Beattie and Professor Jim Longhurst at UWE and Duncan Laxen, Air Quality Consultants Ltd for their help in writing this article.

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■ *Nicky Woodfield is Co-ordinator, Air Quality Management Resource Centre, UWE, Bristol.*

ENVIRONMENTAL NEWS

Sustainable development and the rare birds index 1999

The wild bird population index increased in 1999, owing mainly to the mild winter of 1998-99. Overall however, there has been a decline in the bird population index since the mid 1970s. Some individual species such as the linnet and tree sparrow shows signs of recovery but others such as the skylark and kestrel remain in long-term decline.

New wild bird population index figures for 1999 have been produced for DETR by the Royal Society for the Protection of Birds (RSPB) and the British Trust for Ornithology (BTO). These update the headline indicator for sustainable development and show the population trends in UK native species of wild birds over the period 1970 to 1999.

On average, populations of common breeding birds increased in 1999 from the low levels recorded in 1998. This upturn is thought to be due mostly to the mild winter of 1998-99 which increased the survival of many of our smaller resident birds. Overall there has been a shallow decline in bird populations since the mid 1970s.

Populations of farmland species increased on average in 1999 but the present farmland birds index remains 40 per cent below the value in 1975. The latest figures for individual species such as the goldfinch and the red-listed (i.e. endangered or vulnerable) linnet and tree sparrow show signs of recovery in populations; however bird counts often fluctuate from year to year and a much longer time period is needed to detect a recovery.

Other species such as the grey partridge, skylark and kestrel remain in long-term decline. The recent upturn in farmland birds probably reflects milder winter weather.

Woodland species

On average, populations of woodland species also increased in 1999. The latest figures for individual species such as the wren, goldcrest and long-tailed tit show strong recovery in populations; these small birds are very vulnerable to cold winter weather.

Other species such as the bullfinch and willow tit continue in long-term decline. Despite the recent upturn, the woodland bird index is 20 per cent below the value in the mid 1970s.

Rare Bird Population Index

New information is available on the populations of rare birds (those with fewer than 500 breeding pairs in the UK). Rare breeding birds are not included in the headline indicator. They show markedly different population trends from common birds, reflecting the targeted efforts made by the statutory conservation agencies and voluntary bodies like the RSPB, in conserving their populations. There has also been long term recovery of some birds of prey from the effects of pesticides and persecution.

Rare birds have increased over the last 30 years – on average their populations have doubled. Concerted efforts by conservation agencies, voluntary bodies like RSPB and other landowners and farmers, have resulted in the populations of bittern, corncrake and stone curlew all reaching their Biodiversity Action Plan (BAP) targets in 2000. Success in the conservation of rare birds reflects targeted research and action. The conservation of more common birds raises different challenges because it requires more extensive changes in the countryside and the way it is managed.

Consultation on green fuels challenge

Industry and environmental groups have been asked to advise on possible environmental and health and safety aspects of alternative fuels, taking forward the Green Fuels Challenge announced by the Chancellor last November.

Greener fuels can help cut the environmental impact of transport. The Green Fuels Challenge aims to stimulate industry to propose practical options – the most promising alternative fuels should qualify for major cuts in duty rates in the next Budget statement.

Environment Minister Michael Meacher and Transport Minister Gus Macdonald invited fuel producers, motor manufacturers, environmental groups and others to provide information on a range of environmental, health and safety and vehicle performance issues.

Ministers are searching for fuels which, in both the short and longer term, cut emissions of harmful local pollutants and greenhouse gases and help cut other environmental impacts, such as waste.

Increasing use of green fuels will additionally allow the United Kingdom transport system to start cutting its dependence on crude oil and its dramatic price fluctuations.

ENVIRONMENTAL EDUCATION

Educational paradox

The numerous environmental issues locally and globally that have hit the headlines recently provide excellent material for environmental educationalists.

Local flooding in large areas of Britain raise questions about our (changing) weather and climate patterns, flood control methods and planning policies on vulnerable areas. The national travel problems focus thoughts on integrated and public versus private transport. Interest in countryside and wildlife issues have been roused by the Rural White Paper, the anti-hunting vote and animal rights actions. No shortage of topical local case studies.

Global public attention has been focused on natural hazards in El Salvador and the vulnerability of poor people to such disasters. Then, a human induced disaster a few hundred miles away threatened the Galapagos Islands which had inspired Darwin's biological theories and on which unique species still exist. The examples of genetic modifications of plants and more recently animals, including primates, attract interest and concern in another complex environmental issue. No shortage of topical global case studies.

The paradox

And yet at the same time of this continual stream of 'real world' examples, the curriculum pressures in schools make it more difficult to ensure that all children have the opportunity to learn from such fascinating but life threatening incidents. Too often it depends upon the creativity and enthusiasm of the individual teacher. Some schools and even authorities have still no written and operational environmental education policy although school eco groups, environmental forums and special interest groups may still abound.

In the FE and HE sector, the continued, and as yet undocumented, decline in the appeal of environmental science/studies also means that fewer students than ever, since the halcyon years of the late 1980s and early 1990s, are studying environmental issues as part of their programmes. This phenomenon and the swing back to disciplinary programmes have reduced the interdisciplinary analysis of these complex vital issues.

Environmental literacy is being left to the newspapers and television, but that is a fickle dependence. Fickle because column inches shrink with the next fashion.

And yet NGOs, the informal education sector and government and statutory bodies suggest that things may not be as bad as all that. According to the government's first Annual Report on the Quality of Life, launched in late January by Jonathan Porritt, the Chair of the new Sustainable Development Commission, educational indicators can show improvement nationally. The report claims to be a 'barometer' of 15 key indicators using 1999 data. The Commission's terms of reference are to advocate sustainable development across all sectors in the UK, reviewing progress and building consensus on actions needed. But with only one full time practising expert from the educational sector on the 22 person membership list, environmental educational discussion will not be central. In fairness, other government quangos are better tasked for strategic and tactical responses to the environmental educational paradox.

The surge of environmental educational interest in the build up to the Earth Summit in Rio in 1992 is in sharp contrast to the apparent vacuum in the lead up to the Rio +10 Earth Summit next year. An official in the DETR office responsible for the UK planning for Earth Summit III at the time of writing could still not name the city, or the month let alone the agenda for the conference; we do know it is to be in South Africa. Bodies like UNED UK and WWF UK and others are planning their programmes but their contribution to the UK formal environmental education situation is as yet unclear.

Political priorities

The Presidential election in the USA, an anticipated General Election in the UK and the continual stream of political changes in other countries continue to divert political attention from environmental issues.

The environmental ethic of President Bush is still to be evaluated for he, unlike Gore, has not written about his vision for a more sustainable world. Prime Minister Blair did not give his first speech on environmental issues after his election until 24 October 2000. President Putin's first political action on the environment was to disband the Committee on Environmental Protection and the Federal Forestry Service in Russia.

Meanwhile, the Intergovernmental Panel on Climatic Change has published another raft of statistics, trends and information on global warming, but will the message ever be incorporated into our children's education? Therein lies the paradox.

■ *The Earth Summit 2002 website (http://www.earthsummit2003.org) contains information on the forthcoming summit and links to background papers and national strategies.*

Derek Blair

Article	Author	Volume	No
Minister Unveils 'High Risk Areas' Plan to Protect Britain's Coastline		9	1
The Introduction by European Union Directive of Integrated Pollution Prevention and Control	G. L. Jambor AMIEnvSc	9	1
Government Response to House of Lords Report on Radioactive Waste		9	1
Meacher Seeks Views on Common Land in England and Wales		9	1
Energy Intensive Sectors of Industry Agree Efficiency Targets		9	1
Research Into Gulf War Syndrome		9	1
Green Belts Threatened		9	1
The Natural Step, Systems Approaches and Higher Education		9	1
A Decade of Dramatic Improvement in Air Quality Predicted		9	1
QAA Subject Benchmarking Statement on Environmental Studies: The IES Response	D. Blair MIEnvSc	9	2
Climate Change Report Welcomed	—	9	2
Environment Minister Challenges Local Authorities and Industry: Help Clean Up Britain	—	9	2
Proposals Unveiled to Cut Fuel Bills and Greenhouse Gas Emissions	—	9	2
New Guidance on Water Recycling	—	9	2
Charting a Quieter Life for Britain	—	9	2
Soil Conservation in the Hammurabic Code	J. McManus	9	2
Latest Estimates Show Continuing Decline in Carbon Dioxide Emissions	—	9	2
Conservation Issues in the Coastal Zone – A Case Study	M. Phillips MIEnvSc	9	2
Sheffield Gets Regeneration Company	—	9	2
Panel On Sustainable Development Calls For New Priorities	—	9	2
A New Beginning	Sir Robert May	9	3
Light Rail Future for Urban Transport?	—	9	3
Campaigners Challenge Business to Capitalise on the Environment	—	9	3
New Zoo Practice Standards Launched	—	9	3
Businesses Urged to Report Their Environmental Impacts	—	9	3
Environmental Education for Sustainability, 2000-02	Derek Blair	9	3
The Air Quality Strategy – An Evolving Process	N K Woodfield MIEnvSc, C I Beattie and J W S Longhurst FIEnvSc	9	3
PCBs to be Phased Out	—	9	3
Mullin Announces £21 Million for Contaminated Land Cleanup	—	9	3
The Cost of Climate Change – UK Report is a World First	—	9	3
Business and Government Working Together to Combat Climate Change	DETR	9	4
GM Field Trials and the Democratic Process	Dr Sue Mayer – GeneWatch UK	9	4
Inventory of Greenhouse Gases in North West of England	—	9	4
Tackling Climate Change: A Transformation in Energy Use	DETR	9	4
Greens Alone Do Not Make for a Healthy and Balanced Diet	Marcus T. Armes	9	4
Launch of Science Council	—	9	4
Plans Published for Further Major Cuts in Radioactive Discharges	—	9	4
Study of Environmental Planning	Response by the IES to the RCEP	9	4
Sustainable Development and the Professions	Professor Stephen Martin FIEnvSc	9	4
The Waste Mountain – Waste of Money, Waste of Space	DETR	9	4
Restoration of Kugurlui Polder Sets Example for Ukraine	Paul Goriup	9	4
Ice Core And Glacier Evidence Point To Global Warming	—	9	5
Government Help For The Countryside	—	9	5
Major Steps Taken To Protect Wildlife	—	9	5
Tough Measures For Poor Waste Sites	—	9	5
New Targets For Recycling Packaging	—	9	5
A Green And Active Summer?	—	9	5
Creating An Environmental Vision	—	9	5
Warming Of The North Sea	—	9	5
Cyber Voices Against Climate Change	—	9	5
Crisis Of The Motorised Economy	Dr Derek Hall MIEnvSc	9	5
Assessing The Environmental Risk of GM Technology: A Cost/Benefit Analysis	Guy M. Poppy	9	5
'Waterways For Tomorrow': A New Lease Of Life For Inland Waterways	—	9	5
Tough New Controls on Ozone Depleting Substances	—	9	5
Greater Protection For Rare Birds	—	9	5
Investing in a Cleaner Future	—	9	5
Get 'Motorvated'		9	5
FoE's Gathering Storm	—	9	5
India and UK Team Up to Study Climate Change	—	9	5
New Key Adviser On Sustainable Development	—	9	5
UK Announces New Packaging Targets	—	9	6
Sustainable Development Professionals: Who Needs Them?	Professor Shirley Ali Khan	9	6
Hague Talks on Climate Change	—	9	6
UK Takes Action to Save Duck	—	9	6
Increased Paper Recycling Proposed	—	9	6
Birds and Agriculture	Dr Jeremy Greenwood	9	6
Making Sense of Sustainability	James Wilsdon and Jonathon Porritt	9	6
Future Developments in Agriculture	Sir Colin Spedding	9	6
Top UK Businessman to Chair G8 Renewable Energy Taskforce	—	9	6

The Hon. Secretary's news desk…

Professional Practice for Sustainable Development – PP4SD

This project was initially set up to run for two years starting in April 1999 and funded largely by the Department of the Environment, Transport and Regions (DETR), Environmental Action Fund Grant and financial contributions by WWF-UK. This period is now coming to an end and indications are that by the end of March all the targets originally set will have been successfully accomplished. It therefore seemed appropriate to give members some flavour of the content of the project work and our leading article in this edition reproduces the content of the second publication from the project. In preparation is a considerably larger document containing extensive details of a Foundation Course (described in the feature article).

The Project has also been highly successful in capturing the imagination and support of the thirteen other participating institutions and moves are now in hand to promote a continuation of the project into a second phase!

Membership subscriptions 2001

In the November/December Journal there was an announcement regarding the impending rise in subscription levels. I would remind members that the period of grace for renewal at last year's rates runs out at the end of March. Reminder invoices sent out after that date will be at the new higher levels.

Responses

Since our last report the Institution has submitted a number of responses to consultations.

These are as follows:

- Demolition of Sports Facilities (to the DETR).
- SSSIs: New Legislation (to the DETR).
- Discharges of Dangerous Substances (to the Environment Agency).
- Chemicals in the Environment (to The Royal Commission on Environmental Pollution).
- PPG Note 14 Annex 2 (to the DETR).

Nationwide competition

The Nationwide Building Society has circulated details of national awards for voluntary endeavour in voluntary and community work. This can include voluntary work with environmental projects. There are categories for young people under 18 and for adults, either singly or in groups.

The closing date for entries is 30 April 2001 and leaflets giving full details may be obtained from the Institution.

Journal editorship

The retirement of our long-term Journal editor, Richard Dix, was announced last summer and at that time it was expected that Dr Michael Romeril would be taking up the position. Due to unforeseen circumstances and work commitments this has not proved possible and it has been necessary to make alternative arrangements. I will therefore be continuing to edit the *Environmental Scientist* until such time as a suitable alternative is found.

The quality of the Journal that we produce depends to a great degree on the contributions of many different authors. I know our membership contains a wealth of talent so **please do keep those articles coming!**

RAF

New members

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

Mr M. O. Cartwright	Post Graduate University of Sheffield
Mrs J. A. Drew	Environmental Protection Officer Environment Agency
Mr H. Hughes-Jones	Recent Graduate North East Wales Institute
Miss E. M. Haswell	Student, Lancaster University
Mr S. A. Milford	Recent Graduate University of Glamorgan
Miss J. L. Quinton	Trainee Environmentalist Manchester Airport Plc
Mrs C. T. Simmers	Environmental Protection Officer, SEPA

The EIC Guide to the UK Environmental Industry 2001

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:

Contact Samantha Skiller, Tel: 0121 608 2300

E-Mail: sam.skiller@mcmillan-scott.plc.uk

Obituary

IES Member, Gerard Le Claire died in a helicopter crash in Mongolia on 14 January.

Mr Le Claire was Director of the Environmental Services Unit of the Planning Department in Jersey. At the time of his death he was on secondment to the UN as part of a UN Disaster Assessment Team sent to evaluate the impact of the severe weather the region had experienced over the last year.

Mr Le Claire was a valuable member of the environmental team in Jersey but had frequently assisted the UN in such disaster operations. A UN spokesman in Geneva, talking of Mr Le Claire's many contributions over the years, described his death as a tragic loss for the UN.

Forthcoming conferences and courses

15 March
Achieving Effective Sustainable Development
The European Policy Agenda during the Swedish Presidency.
Venue: Royal Over-seas League, London SW1
Contact:Louise Rushworth, QMW Public Policy Seminars, Burlees House, Hangingroyd Lane, Hebden Bridge, West Yorkshire HX7 7DD
Tel: 01422 845584 E-Mail: seminars@qmwpps.demon.co.uk

20 March
UK Preparations for Earth Summit 2002
The National & Global Dimensions
Venue: The London School of Economics
Contact: UNED UK, 3 Whitehall Court, London SW1A 2EL
Tel: 020 7839 1784
E-Mail: info@earthsummit2002.org

26-28 March
Industrial Air Pollution Monitoring
University of Leeds
Details: Alison Whitele, University of Leeds 0113 233 2494
email: cpd.speme@leeds.ac.uk

29 March
Stakeholder Accountability: the new sustainability agenda for business.
Hosted by the Environment Council
Venue: QE11 Conference Centre, London SW1
Contact: Samantha Dixon
Tel: 020 7698 3003
Fax: 020 7698 3030
E-Mail: sam.dixon@neilstewartassociates.co.uk

5-6 April
International Sustainable Development Research Conference 2001
Venue: Manchester
Contact: ERP Environment
Tel: 01274 530408
E-Mail: elaine@erpenv.demon.co.uk

5-7 April
Sixth International auDes Conference: Bridging Minds and Markets
Venice. Contact Mr Robert Boem, Kele & Tursmo e Congressi S.r.1
San Marco, 4930; 30124-Venezia (Italy)
Tel 0039-041-5208722
Fax: 0039-041-5208913
E Mail: ktvenezia@touritel.com
http://www.keleteo.com/

23-25 April
(ECO) Design for Profit: achieving commercial success
Venue: The University of Sheffield
Contact: Amber O'Malley
Tel: 0114 222 4600
E-Mail: ecodesign@sheffield.ac.uk

Diary dates 2001

7 March	**Education Committee**	**10.30**
	AGM and Council	**13.30**
2 May	**GP Committee**	**13.00**
13 June	**Education Committee**	**10.30**
	Council	**13.30**
10 September	**GP Committee**	**13.00**

Occasional papers available now from IES

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.

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