precaution in practice

how the precautionary principle is used by government, business and NGOs

“green alliance...

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Green Alliance

Green Alliance's mission is to promote sustainable development by ensuring that the environment is at the heart of decision-making. It works with senior people in government, parliament, business and the environmental movement to encourage new ideas, dialogue and constructive solutions.

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executive summary

The precautionary principle is a cornerstone of environmental policy, and is enshrined in policy and legislation at a UK, EU and international level. It is used to justify, or criticise, decisions on issues where there is scientific uncertainty – from genetic modification to the use of mobile phones. Yet there is no clear agreement on what it means in practice.

This report examines precaution in practice – how the principle has been used in decision-making by business, government and NGOs (non-governmental organisations). It is based on a series of seminars, one for each of these groups, which examined how precaution is viewed, and used, within the sector. A final seminar brought the three groups together to look at ways forward.

the seminars

The seminar with business participants showed an emerging response to scientific uncertainty and risk issues, framed in terms of reputation management and corporate social responsibility. Business has been wary of the precautionary principle, seeing it as a tool used by NGOs and government to restrict business activity and innovation. However, there is a growing realisation that it is an essential element of responsible corporate governance. Business participants were keen to ensure that precaution stimulates, rather than inhibits, innovation. They also stressed the need for more transparency and openness in dealing with these issues, and recognised that two-way communication with the public was necessary.

NGOs have used the principle to justify their standpoints on issues including genetic modification and chemicals regulation. The seminar showed that they saw the precautionary principle as an overarching approach to handling scientific uncertainty, and as a mechanism for placing policy decisions within a societal context. They stressed that the principle should question the need for a technology in the first place, and that precaution should be about broadening appraisal to include not just scientific evidence and cost-benefit analysis, but views and values too. Like the business group, they emphasised the need for transparency and public involvement in decision-making.

At the government seminar, precaution in practice was seen as a framework for decision-making. The principle is set out in the UK's sustainable development strategy, and has been discussed widely in response to BSE. There is agreement that precaution should include widening decisions beyond a narrow scientific base; incorporating values; and increasing public involvement. However, participants identified a gap between understanding of the issue, expressed through guidelines and best practice, and actual action, particularly when dealing with high-profile or controversial issues.

consensus

The three groups – business, NGOs and government – approach the precautionary principle from different perspectives, and value it for different reasons. However, the project showed that a clear consensus is emerging from all three groups about the essential elements of precaution. If precaution is looked at in terms of a process – a way of making decisions under scientific uncertainty – then there is consensus amongst the three groups about how a precautionary process should work:

- Precaution is part of, not instead of, good science.
- Continuing scientific monitoring and research is essential.
- Tools such as risk assessment and cost-benefit analysis should be used in context.
- There is a need for genuine stakeholder and public involvement.
- Openness and transparency is central.
- A precautionary decision-making process will not necessarily result in a ban – there is a range of possible outcomes.

Despite this clear consensus, differing views still exist. There is disagreement as to whether precaution is simply a way of making decisions – a context, or mindset, as the NGOs believe; or whether it is a tool to be 'triggered' as the need arises, as business and government assert. Though all groups saw the need for increased stakeholder and public involvement, there was no clear view on how this should be reflected in the decision. There was disagreement about provisionality – how long precautionary measures should remain in place – and proportionality – how to ensure that precautionary action is proportional to the potential risk.

where now? recommendations

These differing views notwithstanding, there is enough consensus between the groups about the need for a precautionary process, to move beyond the theory of precaution, toward agreement about precaution in practice. The elements of the process are defined in the bullet-point list above. These will need to be acted on in different ways in the different sectors.

For business, there is an opportunity to take pride in precaution, by integrating it into strategies for corporate social responsibility. Guidelines such as the Turnbull guidance and the UN Global Compact help to frame this approach. Business should make broader use of its consumer panels to ask wider questions about views and values, thereby informing innovation strategies. The precautionary principle needs to be built into innovation by creating links between marketing, risk managers and R&D teams.

The challenge for NGOs is to state how they are using the precautionary principle, and explain why they believe precautionary action is necessary. NGOs could play a key role in monitoring implementation of the principle,

praising good practice and naming and shaming when necessary. Through joint ventures and partnership with government and business, NGOs could also help to build precaution into innovation.

Government needs to embed precaution firmly into policy guidance and appraisal. Stakeholder bodies and processes for public involvement should be given a central role in policy-making, and science should be used alongside other sources of information. Honesty about uncertainty is crucial. Embedding a precautionary process in codes of conduct and government guidelines could lead to greater agreement on precaution, and a firmer legal footing for the principle. However, government also needs to acknowledge that decisions based on uncertainty are inherently judgemental, and inevitably political. Under political pressure, government tends to play down uncertainty, and close down decision-making.

future directions

A precautionary process can make decision-making under scientific uncertainty more predictable and robust. Upcoming issues including the end of the field trials of genetically modified crops; the regulation of bioaccumulative chemicals; and the uncertainties surrounding waste incineration will all provide a testbed for precaution. Government will need to follow a precautionary process, and make decisions in a transparent, inclusive way. Business will have to do likewise. NGOs, too, will have to state their position carefully, and explain the justification for precaution. The process set out in this report could help all three groups to reach a better understanding of precaution in practice, producing better outcomes for human health and the environment.

introduction: where next for precaution?

The precautionary principle is a central tenet of environmental policy. It has been used to justify – or criticise – decisions about genetic modification, chemical residues in children's toys, and the use of mobile phones. Yet it is a contested issue. There is no clear agreement about what it means in practice, or, in fact, what a precautionary decision involves.

One thing is clear. The precautionary principle is a response to scientific uncertainty[1] (see box for definition). Where uncertainty exists about potential environmental or health effects of a technology, supporters of the precautionary principle would argue that there are still grounds for action. In other words, the fact that there is uncertainty should not be an excuse to do nothing.

This is the sentiment behind the most widely-agreed definition of the precautionary principle, set out in Article 15 of the Rio Declaration in 1992. The declaration states that "where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."

Since the Rio Declaration, the precautionary principle has been enshrined in environmental policy and legislation at a UK, European and international level – from the UK's sustainable development strategy[2], to the European directive governing deliberate release of genetically modified crops[3], to the Cartagena Protocol on biosafety agreed in 2000[4].

"uncertainty should not be an excuse to do nothing"

Though the principle is widely quoted, there is little consensus on how it should actually be used in practice. To try to fill this gap, the European Commission published a Communication on the Precautionary Principle in February 2000[5], and the European Council of Ministers agreed a Council Resolution on the Precautionary Principle at the Nice Summit in December 2000[6]. These texts attempt to tie down the Rio definition, and codify the essential elements of precaution in EU policy, setting a predictable framework for its application.

This report, and the project upon which it is based, takes a different approach. While definitions are argued over at international conferences and in the corridors of Whitehall and Brussels, organisations – whether government, business or NGOs – have been making decisions and drafting policy based on their understanding of precaution. Drawing on these experiences, this report starts from real, practical examples of precaution in practice, and draws out some more general lessons from them. Rather than beginning with theoretical definitions and trying to understand what this would mean in practice, the report starts with the practical and works back to the theory.

As this report shows, looking at it this way helps develop understanding about how the precautionary principle can be used to make better decisions. It doesn't remove all conflict or debate, by any means – but it allows a surprising amount of consensus to emerge about why and how to be precautionary. At the end of the report, we draw out and explain this consensus, and use it to offer recommendations – to government, business and NGOs – about action in response to scientific uncertainty.

definitions: principle, approach or process?

There has been much debate about the difference between the 'precautionary principle' and a 'precautionary approach'. Whilst some favour the idea of the principle, because it has been defined in international law, others favour the looser term 'precautionary approach'. However, there is no widely accepted definition of an 'approach'. This report, in contrast, puts forward a 'precautionary process'. For the purposes of this report, the following definitions are used:

scientific uncertainty

All science is, to differing degrees, uncertain. However, in this report, the phrase refers to situations where knowledge about likelihoods and outcomes provides little or no basis for probabilities. Further discussion of this point can be found in the academic literature[1].

precautionary principle

As defined in the Rio Declaration: "where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."

precautionary approach

A looser term, referring to precautionary action taken as a response to scientific uncertainty. It is often defined on a case-by-case basis by the user, for example a company or country.

precautionary process

This report puts forward a 'precautionary process', which sets a practical framework for precautionary action, by establishing criteria for decision-making under scientific uncertainty. It thereby contributes to the precautionary principle or, more widely, a precautionary approach. See the consensus section for the process framework.

the project

This report is based on four seminars, including one each for the NGO sector, business, and government, run by Green Alliance. Each seminar examined how the precautionary principle is viewed, and used, within the sector. A final seminar brought the three groups together to look at ways forward.

the seminars

precaution in practice: the role of NGOs

15 May 2001
Chair: Julie Hill, Green Alliance
Speaker: Andy Stirling, SPRU, University of Sussex
Participants included representatives from Greenpeace, WWF-UK, and Pesticides Action Network.

risk and precaution: a business perspective

20 June 2001
Chair: Julie Hill, Green Alliance
Speakers: Simon Craven, BT; Michael Massey, DTI; Christine Drury, Unilever
Participants: included representatives from One2One, Shanks, TXU Energi, Unilever and BT.

precaution in practice: the UK Government's approach

10 October 2001
Chair: Julie Hill, Green Alliance
Speakers: Robin Foster, Health and Safety Executive; Jeremy Hotchkiss, Performance and Innovation Unit, Cabinet Office; Rebecca Willis, Green Alliance
Participants included representatives from the Environment Agency; Department of Health; Treasury; National Consumer Council; DTI; DTLR and Cabinet Office.

final seminar: conclusions and recommendations

14 March 2002
Chair: Julie Hill, Green Alliance
Participants included representatives from the three previous seminars, and from all three sectors.

At each seminar, participants were asked to focus on practical examples of the precautionary principle in action. The structure and content of the discussion was adapted to suit each group, but questions discussed included:

- What experience have participants had of using the precautionary principle in decision-making, or recommending its use?
- What are the factors that make up a precautionary approach to decision-making?

- What are the potential pitfalls of the precautionary principle?
- How should organisations use the principle in their decision-making?
- How should the UK government take forward its commitment to the precautionary principle in its policy-making?

The seminars were small, round-table discussions, designed to ensure maximum participation. Each seminar consisted of initial, scene-setting presentations, followed by discussion, both in plenary and in small groups. The seminars were conducted under Chatham House rules to allow a full exchange of views.

In addition to the seminars, this report draws on the body of academic research on risk and precaution[7], as well as previous Green Alliance work including a joint project with the ESRC Global Environmental Change Programme, published in June 2000 as *Steps into Uncertainty: Handling risk and uncertainty in environmental policy-making*[8].

The report takes a look at precaution from the point of view of the three different groups – government, business and NGOs. It then draws together some areas of consensus between the groups – as well as highlighting some less consensual issues. Finally, it offers recommendations on ways to implement precaution in practice.

This report is based on the findings of the four Green Alliance seminars, and is a synthesis of views expressed. However, it does not represent a formal consensus between all participants. The interpretation and opinion given in the report, and the views expressed in the recommendations are those of Green Alliance.

viewpoint: business

Businesses in sectors as diverse as food, telecommunications, and waste management have to deal with issues of scientific uncertainty. Very few companies have explicitly signed up to the precautionary principle, and those taking a precautionary approach rarely express it in such terms. Some businesses see it quite negatively, as a tool used by NGOs to restrict business activity. Many companies have developed sophisticated methodologies for handling risk, and understand the importance of risk management, but have difficulties in dealing with uncertainties or complex risks. However, following a succession of high-profile risk-based controversies, including GM crops, BSE and mobile phone masts, businesses have identified a need to think through their responses to scientific uncertainty. The seminar showed that a clear business response is emerging, with awareness at senior management level, framed in terms of reputation management, corporate social responsibility (CSR) and sensitivity to customer concern.

"the precautionary principle is too often used negatively – to justify a ban"

For business, handling scientific uncertainty is bound up with research and development. Innovation is central to competitive advantage, and new technologies and processes emerge from investment-intensive R&D projects. As part of this research process, companies will look to reduce scientific uncertainties associated with a new technology. But, in the face of competition and transient markets, they see a trade-off and feel that they cannot afford to wait for a very high degree of certainty before launching a new product. As participants pointed out, it is this thinking that is at the heart of business responses to precaution. They also, however, expressed a real commitment to continuing product development and research, to seek to reduce uncertainties over time, and to detect any unforeseen effects. As one participant said, "absence of evidence of a risk does not equate to absence of a risk".

Business participants were quick to point out the importance of transparency, openness and communication in dealing with issues of risk and uncertainty. Businesses are attuned to understanding consumer views and behaviour, and use sophisticated methods of consultation with the public, in the form of market research groups. However, these processes are often focused on narrow questions – linked to the perceived effectiveness of a particular product, for example – and narrow audiences – the target market for a product. The challenge is to extend this model to tackle more fundamental questions about potential environmental or health risks, with relevance beyond individual customers.

When presented with a situation involving scientific uncertainty, many businesses respond with strategies based on provision of information, or

education. In practice, this one-way communication, from the business to the consumer, is rarely effective. As participants acknowledged, there is a gradual recognition that public involvement should be a two-way process, in which companies understand people's concerns and act accordingly. This provides tangible benefits to the company – not least in helping to prevent nasty surprises in the form of objections to processes or products.

precaution in practice
the HERA project

HERA, or Human and Environmental Risk Assessment on ingredients of household cleaning products, was launched in 1999 by AISE (International Association for Soaps, Detergents and Maintenance Products) and CEFIC (European Chemical Industry Council). HERA provides a common risk assessment framework for the household cleaning products industry – to deliver evaluated safety information on the ingredients used in these products. The HERA risk assessment concept uses common principles and a common language in order to aid communication with authorities and the general public. Through providing a common industry response, HERA contributes to the development of a risk-based approach for chemicals legislation.

The HERA project is based on the following principles:

- partnership
- open dialogue with stakeholders
- transparency – including risk assessment procedures, agreed datasets, justification for data selection, reasons for over-riding some standard elements of procedures
- no preconceptions exist of the outcomes of the risk assessment
- sound scientific basis to risk assessment

Further details: www.heraproject.com

Through a growing commitment to the corporate social responsibility (CSR) agenda, many companies are pioneering new approaches to engagement with stakeholders, and encouraging discussion about the wider social and environmental impacts of business practices. However, there remains a gulf between CSR policy and responses to risk or scientific uncertainty. The two issues tend to be managed by different staff in different departments. Those dealing with risk issues may often take a more technical, less stakeholder-focused approach, often citing a need to 'educate the public' through information provision, rather than taking the CSR-based model of stakeholder involvement. There is a need here for joined-up business to translate and embed CSR engagement in risk management culture. This could be done by framing scientific uncertainty as a reputational issue – seen in this context, it is clear that precaution makes good business sense.

precaution in practice
the mobile phone operators' ten commitments

In response to increasing public concern about potential health effects of mobile phone masts, mobile phone operators, through their industry body the Federation of the Electronics Industry, drew up *Ten Commitments* to improve communication and public involvement in decisions about mast siting. Though not explicitly based on a precautionary approach, these commitments are a practical response to scientific uncertainty. Operators have pledged to:

- Develop, with other stakeholders, clear standards and procedures to deliver significantly improved consultation with local communities
- Participate in obligatory pre-rollout and pre-application consultation with local planning authorities
- Publish clear, transparent and accountable criteria and cross-industry agreement on site sharing, against which progress will be published regularly
- Establish professional development workshops on technological developments within telecommunications for local authority officers and elected members
- Deliver, with the Government, a database of information available to the public on radio base stations
- Assess all radio base stations for international (ICNIRP) compliance for public exposure, and produce a programme for ICNIRP compliance for all radio base stations as recommended by the Independent Expert Group on Mobile Phones
- Provide, as part of planning applications for radio base stations, a certification of compliance with ICNIRP public exposure guidelines
- Provide specific staff resources to respond to complaints and enquiries about radio base stations, within ten working days
- Begin financially supporting the Government's independent scientific research programme on mobile communications health issues
- Develop standard supporting documentation for all planning submissions whether full planning or prior approval

Further details: www.fei.org.uk

Business representatives at the seminar felt that the precautionary principle is too often used negatively – for example, when a potential risk is used to justify the ban of a particular chemical. There is a strong feeling that the precautionary principle should not be seen simply as a 'red traffic light' preventing the development of new technologies, but should examine benefits as well as risks. The advantages of a particular technology should be weighed up against the potential risks. Whilst there is concern that mobile phones and masts may potentially have negative health effects, for example, they also provide clear benefits in terms of flexible working and improved personal safety. This should be taken into account. In some cases, a risk management strategy may be better than an outright ban. Or, a precautionary process may conclude that no action is necessary.

A more positive view of precaution is that it can lead to innovation, of product or process. For example, the Marine Stewardship Council's Fish Sustainability Initiative is a precautionary response to declining fish stocks. Unilever, in setting up the Marine Stewardship Council (MSC) in conjunction with WWF, realised that the commercial future of its seafood brands such as Birds Eye was jeopardised if efforts were not increased to reverse the threat posed by overfishing. This precautionary action to prevent fish stocks declining addressed a critical supply issue, and presented Unilever with an opportunity to target consumer power based upon eco-label certification. There is often a sound business case for taking precautionary action. For precaution to stimulate innovation in this way, though, there is a need for clear signals from government, and a predictable regulatory framework. This is discussed in the final section of the report.

Overall, the seminar showed that businesses have an ambivalent attitude toward the precautionary principle. The instant reaction is to view it negatively – as a brake on progress. Yet there is an increasing recognition that a precautionary approach can help companies to innovate, predict public responses and to enhance social and environmental performance.

viewpoint: NGOs

At the NGO seminar, participants representing a cross-section of interests within the NGO sector – from chemicals to countryside – showed a significant amount of consensus on what the precautionary principle meant, and how it could be used. Typically, NGOs use the principle to justify their views or actions, such as the need to restrict the use of a certain pesticide, on health grounds; or to take precautionary action to prevent biodiversity loss. NGOs often cite the precautionary principle in their decisions, but it is rare for them to give an explanation of what the principle means, or what factors make up a precautionary approach. However, the seminar revealed a degree of consensus as to what these factors might be.

Most importantly, NGOs tend to see the precautionary principle as an overarching approach to handling scientific uncertainty, and as a mechanism for placing policy decisions within a societal context. Seen this way, the precautionary principle provides the framework within which action is taken. In contrast, NGOs felt that in the European Commission's Communication on the Precautionary Principle, the precautionary principle is considered as an addition to risk assessment – an optional extra. For NGOs, the reverse is true: risk assessment is a tool to be used within a precautionary framework.

As part of this framework approach, NGOs feel that the precautionary principle should question the need for a particular technology in the first place, rather than simply being a tool for mitigation. It is important to look not just at the risks of a technology, but also at the benefits – and alternatives to it. For example, when considering how to deal with genetically modified crops, it is not just the potential risks of the technology that should be addressed. Instead, risks and benefits should be weighed against alternative options, such as different farming practices.

"the precautionary principle should question the need for a particular technology"

NGOs argue that decisions should be made based on a range of viewpoints, not just the scientific evidence. Risk assessment techniques are useful where knowledge exists, to look at likelihood and significance of negative occurrences, but are insufficient in the face of ignorance and uncertainty. A precautionary process should illuminate the values and assumptions in science, and acknowledge scientific uncertainties. A precautionary decision-making process should link stakeholders, scientists and the public. People may not possess 'expert' knowledge, as traditionally defined, but are often able to triangulate, looking at where information is coming from and the agenda of the information source, and weighing up their decisions accordingly. This expertise should be recognised in the decision-making process.

precaution in practice
five year freeze campaign

In 1999, the Genetic Engineering Alliance launched the Five Year Freeze campaign, calling for a five-year moratorium on GM plants and animals. In November 2001, Five Year Freeze, an alliance of 120 organisations, published an audit of government policy and performance on GM food and crops.

The report highlights the Government's inadequate response to addressing public concerns. It calls for the Government to implement the precautionary principle, particularly in relation to preventing harm to human health, the environment and genetic pollution.

Five Year Freeze highlights the need for greater public involvement and consultation in the decision-making process, and the use of science alongside public consultation. The report also supports the development of farmer-led research and the evaluation of GM against other options.

Specific recommendations included: banning the use of antibiotic resistance gene sequences; introducing a monitoring scheme; assessing secondary effects; a complete review of research needs and suspending the farm scale trials.

Further details: www.fiveyearfreeze.org

NGOs believe that whilst there should be no hard-and-fast rules about implementing the precautionary principle, there can be agreement on a general approach. They argue that the precautionary principle is about a process of decision-making that broadens appraisal, incorporating wider perspectives and involving all relevant stakeholders in a decision. At the seminar, NGOs discussed and agreed a list of factors that make up a precautionary process. For NGOs, precaution is about

- Broadening the appraisal process and incorporating wider perspectives: to include not just scientific evidence and economic cost-benefit analysis, but social values, the degree of uncertainty, and other factors
- Considering alternatives: questioning the need for a technology, and considering what alternative means there are to reach the same end
- Involving stakeholders and the public: to bring about a genuine two-way process of involvement, and increase the robustness of decisions
- Transparency: at each stage of the process
- Choice: not closing down options
- Openness about subjectivity in science: being honest about the values inherent in scientific positions
- Clarity about the role of science in political decisions: science cannot make decisions, it can only provide information which helps politicians to act.

It was emphasised that government and business should make much stronger use of the principle. To make this workable as a policy process, NGOs emphasised the need for a proper regulatory framework, including a system of technology appraisal. It was felt that otherwise, a precautionary process could be vulnerable to political abuse and media scare stories. Part of any policy appraisal should be the presentation of multi-option advice to policy-makers, based on the uncertainties involved. In other words, scientific advisers should offer decision-makers a range of options to consider, to take account of gaps in knowledge and ensure that scientific uncertainties do not get lost between the scientist and the decision-maker.

precaution in practice
greenpeace and PVC

Two years ago, following a long-running Greenpeace campaign, the European Commission placed an emergency ban on soft PVC baby teethers containing phthalates. The ban has remained in place, though in December 2001, the European Commission proposed setting migration limits for some PVC items for under-threes, rather than banning phthalates entirely.

Greenpeace has taken an explicitly precautionary stance on this issue, calling for an immediate withdrawal of all soft PVC toys for children under three. It says that "the safeguards on offer are useful but inadequate precautionary measures". Their view is based on studies that highlight potential health effects of PVC, and a considerable degree of uncertainty about long-term effects on health. More generally, Greenpeace calls for a complete substitution of PVC, because of the health and environmental risks, and in particular, the lack of safe disposal options.

Greenpeace emphasises the need to focus on substitutes for PVC. It urges consumers to seek alternatives, and has set up its own database offering alternatives to commonly-used PVC products.

Further details: www.greenpeace.org.uk

viewpoint: government

Over the last few years, government has put a good deal of thinking into its handling of risk and uncertainty, in response, largely, to BSE. The government response to the Phillips report[9] sets out a position based on a precautionary approach to policy and legislation. The Stewart report on mobile phones, too, offered government a similar solution[10]. However, the seminar showed that practice tends to lag behind the positive statements of policy. This is perhaps because responses to risk and uncertainty have been addressed by quite a small group of risk representatives inside government, based around ILGRA (the Interdepartmental Liaison Group on Risk Assessment), the Health and Safety Executive and the Office of Science and Technology.

As the government response to the Phillips report made clear, precaution in practice is a process, and a way of making decisions, not a standard measurement or set of fixed rules. The UK's sustainable development strategy states that the precautionary principle is a framework for decision-making, providing the impetus for a decision, and preventing decision-makers being paralysed by uncertain science[11]. Recently, following the European Commission's Communication on the Precautionary Principle, ILGRA has established a working paper on the use of the Principle, which takes this framework approach[12].

"public involvement may require fundamental changes to the policy-making process"

An important aspect of this approach, which is increasingly widely recognised within government, is that in cases of uncertainty, the decision-making process needs to be broadened beyond a narrow scientific base. ILGRA, for example, has made it very clear that decisions should not simply be based on statistics generated from cost-benefit analyses or risk assessments, but should incorporate values. Government should not use policy tools such as risk assessment and horizon-scanning in isolation, but as part of a broader appraisal process. This process should assess the wider costs and benefits for action – as the sustainable development strategy points out.

The ILGRA working paper makes it clear that invoking the precautionary principle should be a transparent and accountable process. Decisions based on uncertainty are inherently judgemental, thus transparency and openness about the assumptions made is essential. Government participants acknowledged that assumptions are made at every stage of the decision-making process – from scientific uncertainties and reasons for being precautionary to risk management options – and this should be stated from the outset.

precaution in practice
the independent expert group on mobile phones (the Stewart report)

In May 2000, the Independent Expert Group on Mobile Phones, chaired by Sir William Stewart, published a set of recommendations to government and industry on possible health effects of mobile phone technology. The report recommends that "a precautionary approach to the use of mobile phone technologies be adopted until much more detailed and scientifically robust information on any health effects becomes available" and that "national and local government, industry and the consumer should all become actively involved in addressing concerns about possible health effects of mobile phones."

The report outlines what such a precautionary approach should entail: "The precautionary approach is not all or none in nature. Rather, it is a matter of degree. In essence, it requires that before accepting a new development we should have positive evidence that any risks from it are acceptably low, and not simply an absence of convincing evidence that risks are unacceptably high."

It also highlights specific precautionary action that should be taken, such as limiting the use of mobile phones by children under sixteen, adherence to the more stringent international (ICNIRP) guidelines, rather than national guidelines, for public exposure to radio frequency (RF) radiation, and commissioning further independent research.

Further details: www.iegmp.org.uk

Public outcries over BSE, genetic modification and the MMR vaccine have shown government that one-way transparency in communication is insufficient. There was unanimous agreement at the seminar that public views need to be better incorporated into the decision-making process. The establishment of consultation bodies like the Agriculture and Environment Biotechnology Committee (AEBC) is an experimental step forward. Policy-making needs to enable the widest range of views to be heard. Though this lesson is now quite widely understood, there is little agreement or confidence in how it can be taken forward in practical terms. Building in this sort of public involvement may often require fundamental changes to the process of policy-making.

Participants pointed out that openness in decision-making is essential to incorporate business into a precautionary framework. In the past, business has been excluded from the decision-making process, and has been forced to be reactive. A proactive, inclusionary process will move precaution from a legal instrument to a policy practice which is more comfortable for business.

Although the need for precaution is understood by government, elements of such an approach can get lost when an issue becomes politically controversial. This has been shown clearly with both genetically modified

food, and the MMR vaccine. Where considerable scientific uncertainty exists, under political pressure, government has tended to play down risks in an attempt to reassure a worried public. This can backfire when uncertainties emerge, as the BSE crisis showed all too clearly.

precaution in practice
the Environment Agency's strategy for endocrine-disrupting substances

In 1998, the Environment Agency published a consultation document to address evidence of the effects of discharges from sewage-treatment works on freshwater fish. The document resulted from the recognition that the level of uncertainty and debate on this issue could delay action. The Environment Agency's approach is based on an integrated view towards environmental protection, sound science, working with all relevant sectors of society, and taking a precautionary stance. The resulting strategy has four main elements:

- Taking cost-effective action to reduce the risk
- Targeted monitoring to evaluate the concentration of these substances
- Further research to address areas of scientific uncertainty
- Raising awareness and providing information

The Environment Agency intends to take action to manage the risks from these substances. Despite the high levels of uncertainty, action will be taken to minimise discharges of substances for which endocrine-disrupting effects have been reported. This will be underpinned by a further twenty areas for action identified. As part of the process, the agency presented an initial assessment of the risks of endocrine-disrupting effects in wildlife through exposure to steroids. This aimed to help support decision-making about priorities for investment. This will require a further programme of collaborative research in order to set environmental standards, refine risk assessment techniques, identify treatment options and their respective costs and benefits, and to investigate in more detail the ecological relevance of endocrine disruption.

Further details: www.environment-agency.gov.uk

consensus

The three groups involved in Green Alliance's project – business, NGOs and government – approach the precautionary principle from different perspectives, and value it for different reasons. However, during the project, a clear consensus emerged from all three groups about the essential elements of precaution. The seminars made clear that there is significant agreement on how scientific uncertainty should be handled – though some differences remain, of course.

a precautionary process

Primarily, there is strong agreement between the groups about the need to move beyond the debate over definitions, and build on attempts to implement the theory, such as the European Commission Communication. It is accepted that precaution will always be a contested concept, and that definitions will differ. However, precaution could be looked at in terms of a process, rather than a principle. The existence of scientific uncertainty means that a broader, more considered approach to decision-making is necessary. In other words, where there is scientific uncertainty, there is a need for a precautionary decision-making process.

what's the process?

All three groups saw the advantages of this sort of precautionary process. So what are the elements that make up the process? Consensus emerged around the following points:

- Precaution should not replace good science. Scientific analysis is central to a precautionary process, as all groups pointed out. However, there is a need to be honest about the extent of the scientific evidence, the assumptions behind it, and the uncertainties and gaps in knowledge.
- Continuing scientific research and monitoring is essential. The business group, in particular, stressed the need for research into scientific uncertainties, in part to attempt to reduce such uncertainties, and in part to stimulate innovation and gain competitive advantage.
- All groups stressed the need to use particular tools, such as risk assessment and cost-benefit analysis. However, there were differing opinions as to how they should be used. NGOs tended to stress the importance of overarching societal considerations, and wanted recognition of the limitations of these tools. Business representatives were happier to rely on good risk assessment to make decisions – though they understood the need to supplement this with other perspectives.
- At all seminars, the importance of genuine stakeholder involvement was stressed. A precautionary process is about two-way dialogue, rather than one-way information flow. Although there was agreement about this idea in general terms, in practice, such involvement is difficult, and

involves a change in mindset, particularly for business and government, who are much more at home with an approach based on 'public education' and information provision.

- Openness, transparency and consultation – about decisions and the assumptions behind them – were seen as very important, to show how organisations have come to their conclusions. However, as with stakeholder involvement, this is easier said than done. A genuine opening-up of decision-making poses challenges for all groups, whether business, government or NGOs.
- A precautionary decision-making process will not necessarily result in a ban or strict control on the process or product in question. All groups stressed that it would be quite possible to go though such a process and conclude that no remedial action was necessary. Precaution need not be a red traffic light, as the business seminar pointed out. However, there will be times when this is the precautionary course of action.
- A precautionary process should be built into innovation. We need to move away from the precautionary principle and risk management as reactive measures, and be proactive about precaution. The further upstream a precautionary process is embedded, the less chance there is for a crisis to unfold. In business terms, the cost implications of taking action can be balanced against the costs of not taking action. NGO participants emphasised that precaution provides a mechanism to stimulate innovation in ways in which society wants, rather than driven simply by economics or patent laws.

"we need to be honest about the extent of the scientific evidence, and the uncertainties and gaps in knowledge"

Despite the possibility of identifying a precautionary process, it is important to stress that using the precautionary principle will always involve judgement. Different interpretations or opinions are inevitable. A precautionary process should be a set of guidelines, not rigid rules – in the end, the decision is subjective, not objective.

differing views

The decision-making approach to precaution agreed by the groups is a clear process for action. However, specific areas of disagreement or difficulty also emerged from the discussions. These different perspectives will be raised, and some will be ironed out, as we become more proficient practitioners of precaution. Different perspectives emerged around the following concerns:

- When to invoke or trigger a precautionary response: The EU Communication on precaution is ambiguous as to when to invoke the Principle, ranging from 'scientific identification of unacceptable harm' to 'possible negative effects'. Participants at the government seminar cited the need for policy to invoke and apply the precautionary principle. For NGOs, in contrast, the principle is about a general way of acting, applying to all decisions involving judgements based on available science, although the process might be applied in different degrees, depending on the level of uncertainty. For NGOs, the very concept of a 'trigger' goes against this idea of a precautionary process.
- Measuring costs and benefits: Although all groups emphasised the need to consider potential costs and benefits of a new technology, the NGO group placed greatest emphasis on the need to consider non-economic costs and benefits, and include broader societal and environmental factors.
- Stakeholder and public involvement: At each seminar the difficulties associated with carrying out stakeholder and public involvement were highlighted – how do you decide which stakeholders and where? How do you decide how much weight to give the views of different groups and how to reconcile conflicting viewpoints? These difficulties, however, could be resolved through wider experimentation and a gradual learning process.
- Provisionality: There was no agreement as to whether precautionary measures should be for a limited time period or maintained until further information arises. Some participants recognised that issues can be indeterminate. However, thinking about precaution as a process rather than a standard measure helps to progress this issue. Precaution in this context is a way of doing things that includes monitoring to incorporate new information.
- Proportionality: That effort mitigated should be proportional to the risk is a particularly pertinent issue for business, in its accountability to management and shareholders. The difficulty arises that in cases of scientific uncertainty, it is impossible to quantify the degree of risk.

"how do you decide how much weight to give the views of different groups and how to reconcile conflicting viewpoints?"

Thinking about precaution in process rather than quantifiable terms helps to address this issue. Alternatively, the concept of 'reasonable action' – what society is prepared to bear – may be a more useful and progressive approach.

- Language/terminology: The 'precautionary principle', 'risk assessment' and 'risk management' all have particular sets of meanings and subjectivities associated with them. 'Precaution' does not sit well with business, who tend to think in terms of risk strategy. Both business and government more readily site precaution within a framework of risk assessment. NGOs found the language of 'risk assessment' and 'risk management' too limited, preferring 'precaution' as an umbrella term. However, new developments in risk assessment such as the new government guidelines[13] incorporate consideration of costs and benefits, stakeholder involvement, and so on, within a risk assessment framework. Under this approach, the definition of risk assessment is widened, and it incorporates much of the process set out in this report.

where now? recommendations for business, NGOs and government

The seminars held by Green Alliance, and the discussion process that resulted from them, showed a broad consensus between government, business and NGOs on elements of a 'precautionary process'. Different groups will, of course, have different emphases, and the existence of these differences should not be ignored. However, this basic agreement on the need for a precautionary process is a useful starting point for moving beyond the theory of precaution, towards agreement around precaution in practice.

The findings of this report build on, and are supported by, other recent work in this area, such as the body of academic research cited earlier[14]; the European Environment Agency's report *Late lessons from early warnings*[15] and the Lowell Statement on Science and Precaution[16], to demonstrate the central role of precaution in environment and health decision-making.

The elements of a precautionary process, as outlined in the consensus section, form a key set of recommendations that all three sectors could use when making decisions based on uncertain science. As discussed above, a precautionary process acknowledges the following general principles:

- Precaution is part of, not instead of, good science.
- Continuing scientific research and monitoring is essential.
- Tools such as risk assessment and cost-benefit analysis should be used in context.
- There is a need for genuine stakeholder involvement.
- Openness and transparency is central.
- A precautionary decision-making process will not necessarily result in a ban – there is a range of possible outcomes.

These will be implemented in different ways depending on the group concerned. The specific recommendations below put this consensus in the context of the three groups we studied: business, NGOs and government – to put forward some challenging guidelines for implementing precaution.

business

- Being proud of precaution – Business should make a virtue out of a precautionary necessity. Business needs to actively market the precautionary action it is taking, to consumers and investors, in order to both raise awareness and gain competitive advantage and shareholder value. This should feature in a business' corporate social responsibility strategy, and environmental and social reporting.
- Listen and learn – Business should listen to the societal agenda and engage with stakeholders: customers, employees, the wider public and

government. Precaution should be a central part of a company's corporate social responsibility strategy. This is an opportunity to inform all areas of business and product development.

- Forewarned is forearmed – Business should make wider use of its customer focus groups, to ask questions not just about products but new technologies and the directions they could lead society. Precaution is a reputational risk issue – asking the big questions will help reduce the chance of big surprises.
- Precaution is profitable – Precaution can be built into innovation by creating links between marketing, risk managers and scientific research teams. Thought of in this way, precaution need not inhibit innovation. Business should use the precautionary principle to guide investment decisions within the context of a risk framework.
- Linking with corporate governance – Businesses can take ownership of precaution by embedding it in corporate governance structures. The Turnbull guidance[17] lays down requirements for responsible risk management within a company. This could be extended to include precaution, to ensure the right management systems are in place. The UN Global Compact requires businesses to be precautionary, and companies must demonstrate how they are achieving this. The Compact sets out 'ways to apply the precautionary approach' – again, this provides a clear motive and structure for precautionary action[18]. More generally, precaution should gradually become an essential component of 'due diligence' for companies – an accepted way for a responsible company to behave.

embedding a precautionary process in policy and legislation

At the final seminar, there was discussion of how to link the precautionary process that this report outlines back to legal definitions of the precautionary principle. Without closing this loop, it will be difficult to ensure consistency of approach.

Though the legal definition itself is ambiguous, embedding the precautionary principle in codes of conduct, government guidance and other guidelines could help to build up a 'library' of uses of the precautionary principle.

The ILGRA working paper, and the current EU STRATA project[19] are all steps in this direction. However, these are aimed at government, and there is also a need to embed the principle in corporate governance structures.

Embedding precaution in this way could lead to a firmer legal footing for the principle. Once embedded in codes of conduct and guidance, it might then form the basis of legal action through judicial review or corporate liability.

NGOs

- Defining the detail – NGOs should not use precaution to justify a position without making clear the reasons behind it. NGOs could do more to state how they are using the principle, and explain why they believe precautionary action is necessary.
- Considering alternatives – A precautionary outcome does not necessarily mean a ban. Alternative action, or no action at all, may well be outcomes of a precautionary process. NGOs should consider a range of responses to risk – is a precautionary approach necessary, or can the risk be managed differently?
- Risks with benefits – NGOs should weigh up the benefits of going ahead with a new technology, and of not going ahead. The public may be prepared to trade off different risks. It is also necessary to think about how costs and benefits are shared.
- Monitoring – NGOs have a role to play in highlighting how and whether business, government and other organisations are implementing the Precautionary Principle. This should 'name and shame', as well as praising good performance.
- Cross-sectoral approaches – NGOs can be instrumental in establishing joint ventures such as the Marine Stewardship Council or Greenpeace's fridge initiative. This could also include setting up NGO/industry consortia for research.
- Participation – NGOs could be involved in extended peer review, to broaden the scientific debate and bring in a wider perspective, thereby helping to frame research questions.

the role of technology appraisal

At the final seminar, participants looked at technology appraisal as a practical way of implementing a precautionary process. Participants felt that technology assessment adds an ability to look at the implications of technology in advance of a crisis. Technology appraisal is a tool to look at issues in the bigger picture. It is useful to look at a broad range of social, economic and environmental impacts.

Technology appraisal should be a public, dialogue-based process, managed by an independent institution. It is a means of setting boundaries within which development can take place, thus providing a link between precaution and innovation. However, for business this can mean stopping innovation, such as GM; whilst NGOs argue that creativity can flow from constraints.

There are limitations to technology appraisal. It needs different approaches at different times in the innovation cycle. Overall, participants felt that technology appraisal could help to build a precautionary process, but is not sufficient in itself.

government

- Involving, not just informing – Stakeholder bodies such as the Agriculture and Environment Biotechnology Commission (AEBC) should be given a real stake in decision-making. Though efforts to involve people and stakeholders in policy-making are increasing, there is a need to be clear about the use to which their views are put. The Cabinet Office should have a role as a repository of best practice for public involvement in policy-making, evaluating attempts and offering guidance to departments. In the longer term, an independent unit which acts as a 'watchdog' of public participation would be valuable.
- Embedding best practice – Even when precautionary action is taken in government, there is a huge task to identify good practice, and to promulgate this through the public sector. These benefits need to be internalised through targets and a long-term, iterative focus. Again, there could be a role for the Cabinet Office in setting standards and being a repository for best practice.
- Linking to guidance – All government departments have guidelines in place for handling risk and scientific uncertainty. These should incorporate guidance on the precautionary principle, and link to existing initiatives, such as the ILGRA working paper.
- Using science, but in its place – Alongside other sources of information. There should be an honesty about the uncertainties involved, and a willingness to accept divergent views.
- Being political – Acknowledge that its a political decision; don't blame or hide behind the science. Decisions based on uncertainty are inherently judgemental, and as such should be made by politicians accountable for their decisions.
- Taking pride in precaution – This is responsible, democratic decision-making and should be championed as such.
- Accepting that there will be mistakes – Learn from these mistakes, to improve and minimise them. A precautionary approach should include monitoring and re-visiting all elements of the decision-making process, undertaking further research to reduce uncertainties.

precaution in practice indicators for government

Participants at the government seminar identified a series of specific measures to embed precaution. These could be developed to provide the basis for a set of indicators to measure government's use of precaution.

- Guidance – from the Cabinet Office; between agencies; to agencies
- Codes of Practice
- Standardisation of decision-making tools
- Best practice case studies
- Target setting
- Precaution built into Public Service Agreements
- Policy reviews to bring about institutional learning
- Transparency: providing an auditable trail

future directions

One of the virtues of a precautionary process, as outlined in this report, is that it makes decisions more accountable. If a clear process is followed, it provides an auditable trail. But how do we audit, or measure, the success of a precautionary process? It is very difficult to assess whether precautionary action was necessary – by its very definition, precaution should prevent harm from occurring.

However, our seminars identified a number of potential indicators of progress toward more effective handling of scientific uncertainty. The success of precautionary action by government and business could be judged by:

- Increased stakeholder involvement, perhaps through an independent public participation unit designed to advise and monitor technology appraisal
- Government, business and NGOs working together, with less confrontation
- Institutionalised processes of precautionary action
- Reduced public anxiety and media sensations
- Precautionary processes that result in a 'do nothing' decision

The seminars produced a strong message that there may not be perfect understanding or agreement on precaution, but there is a real need for action, to prevent BSE or similar situations from occurring in the future. Technological development generally builds on the past. We need to create a critical mass of decisions that have followed a precautionary process in order to minimise the potential for mistakes in the future. The government is faced with some landmark decisions involving scientific uncertainty: the end of GM field trials; chemicals decisions such as endocrine-disrupting and bioaccumulative chemicals; and waste incineration. How will the precautionary principle be taken forward in these cases?

"there may not be perfect understanding or agreement on precaution but there is a real need for action"

The uncertainties around landfill and incineration need to be addressed in the review of the Government's waste strategy. As part of the review, the comparative uncertainties, risks and benefits of waste options should be considered. With 80 per cent of the population living in close proximity to a landfill site, public health concerns relating to waste are not going to disappear, and need to be tackled at a strategic level in government.

Similarly, the end of the field trials of genetically modified crops provides an opportunity for all groups – business, government and NGOs – to reconsider their stance on the issue, and focus on how decisions about GM

should be taken. To prevent a political crisis over the issue, the Government will have to follow a precautionary process, and make decisions in a transparent, inclusive way. Business will have to do likewise. NGOs, too, will have to state their position carefully, and avoid using precaution as a political football. The precautionary process set out in this report could help all three groups to reach a better understanding of precaution in practice, facilitate a cross-sectoral approach and produce better outcomes for human health and the environment.

notes and references

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