Public Understand. Sci. **6** (1997) 359–381. Printed in the UK PII: S0963-6625(97)87152-4

# The public–expert interface in local waste management decisions: expertise, credibility and process

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Decision-making strategies which favour the top-down model do not recognize expertise as a communication and learning process, and have been seen to fail in many risk management contexts, in particular in local waste management decision-making. Examination of a novel public involvement programme in the development of a local waste strategy provides an opportunity to understand expertise as a process: in particular, (i) how expert knowledge is selected at the technical–democratic interface, (ii) how information is shaped and balanced, and (iii) whether knowledge shifts during processes of exposure to expertise. It provides evidence that counters expert views that the public are irrational, lack interest, and are concerned only about zero-risk options. Most importantly, it provides evidence that expertise is inextricably linked to its source, and that perceptions that expertise is not independent have a significant impact on public responses. Means to optimize the process of expertise are discussed.

## 1. Introduction

The potential for the public to be 'sensible about risk' given 'sufficient time to reflect upon balanced information' remains the hope of many experts.[1] The deficit model of the public as knowledge deficient and misguided supports this expectation.[2] The expert is seen as information provider, educationalist and the primary decision-influencer (if not decision-maker). Most importantly, expert knowledge is usually considered to be privileged and legitimate. For nearly two decades authorities and experts have sought to use and promote assumed scientific rationality to enhance the credibility of decisions.[3] The continued support of the deficit model appears to be enhanced by the growing appeal to scientific expertise which is engendered by many techno-scientific controversies,[4] including waste management.

However, while the experts' deterministic tone points to societal adaptation to the scientific view,[5] it also reveals underlying frustrations as to the potential for realization: (i) that the public are not interested; (ii) that people have their own agenda and will not listen to 'objective science;' (iii) that trying to involve activists and special interest groups will be detrimental to the education process; (iv) that people inaccurately perceive risks; (v) that the scientific complexities underlying current techno-scientific debates make them difficult to discuss; and (vi) that the public will always go for the zero-risk option.

Local controversies over the siting of waste treatment and disposal facilities provide clear evidence of such frustrations and challenges. The siting of waste facilities places the interface between the 'technical' and 'democratic' responses to risk[6] under acute pressures. While the proponent usually remains convinced that the science and technology that supports

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the assessment of low risk to the public and the environment should be the basis of the decision, the nature and probability of potential harm is rarely the only factor influencing the decision. The potential for control; the extent to which institutions can be trusted to manage risks; concern over equity in risk-bearing; and concerns over threats to local and personal amenity are significant issues of varying importance to different groups and individuals.[7] The techno-scientific propensity to frame risk narrowly[8] is challenged by a public definition of risk which encompasses any adverse outcome that has physical, economic, social or psychological impacts, and where the management system in relation to any of these outcomes is not trusted.[9]

The role of science in the debate at the technical–democratic interface needs to be considered more broadly. Scientific knowledge and expertise is only one element of 'specialized' knowledge.[10] 'Pure science' might assist in relation to some elements of the debate (for example, the health risks of incinerator emissions, or the groundwater impacts of landfill leaching). However, other expertise (economic, management, operational) is often equally, if not more, important.

The public as legitimate participants in decisions is a theme which underpins the social science component of the risk communication literature. The latter has advanced from a focus upon the need for the expert to 'get the numbers right' and 'tell them the numbers' to providing also for public influence.[11] 'Expertise' is understood as a learning process resulting from interactions between people in a decision-making context. This process defines the efficacy and status of expert knowledge.[4] The siting literature endorses this view,[12] emphasizing the need to make the processes and procedures of involvement and communication fair and competent.[13]

The latter requires greater understanding of what happens at the interface between 'expert' and 'public', of how people respond, and of whether the actual activity of interfacing or interacting can mediate between different interests and can be adapted to improve the management of disputes and promotion of consensus.[14] While much research has focused on the basis of public concerns, particularly NIMBY (Not in My Back Yard) attitudes to siting, and information requirements, there has been less attention to the relationship between expert and public at the interface. We need to understand better: the role of the expert; who is viewed as the expert; how experts are identified; what expertise means; and how it relates to societal structures.[4] In particular, we need greater understanding of the processes of information and expertise selection, and of information shaping and balancing; and of how and if knowledge shifts during these processes. The discussion of a local waste management strategy has provided an opportunity to analyse the expertise process. As an introduction to the analysis, Section 2 provides a brief introduction to the decision context and Section 3 provides detail on the purpose and structure of the public involvement programme examined.

## 2. The local decision context

In 1991, an application for a 400 000 tonnes energy-from-waste incinerator in Portsmouth, Hampshire (southern England), met significant public and political opposition. The proposal was to replace an old incinerator on the same site, but with a facility with five times the capacity. Hampshire has traditionally incinerated municipal waste (30 per cent incinerated in 1991 compared with a national UK average of less than 6 per cent), a policy forced upon it by a shortage of void capacity for landfill.

The Portsmouth proposal met with strong, well-organized and concerted local opposition. The basis of the opposition represented a mixture of policy, need and

environmental impact issues. In addition to concern about air emissions, health risks, visual impact, noise, traffic and the proximity of the site to housing (400 metres), there appeared to be strong policy concern that too much emphasis was being placed upon an end-of-pipe solution to the waste problem, which may be detrimental to the promotion of recycling and minimization.[15]

The view of the County Council towards the Portsmouth development was paternalistic. The political stance tended to be that 'the County knows best' and that the local population could rely upon it to act in their interests. Such a style has not been uncommon in local government over at least two decades, but has become increasingly untenable.[16] This paternalism can be equated with the deterministic ethos of the expert provision of the 'right' answer. The process of communication at the interface was primarily a public relations campaign. Although public meetings and exhibitions were arranged, there had been little real effort to listen to people's views and to take them on board during the development of the proposal. The UK development planning process provides, as a minimum, for a relatively passive approach to communication, potentially encouraging any latent paternalism.

With the failure to gain permission, Hampshire County Council was facing an imminent shortage of disposal capacity and an urgent task to find a solution to the waste management problem. It was clear that there was a need not just to consider a single option for treatment on an *ad hoc* basis, but also to address waste management in a more holistic manner in terms of how to integrate options for managing waste (reduction, recycling, recovery, landfill) in an economically and environmentally effective manner relevant to the local context.

## 3. The public involvement programme

### *3.1. Programme objectives and management*

A voluntary, proactive public involvement programme was instigated in 1993 to examine the options for dealing with waste, and to seek a broad base of support for an integrated strategy which could be translated into a long-term (20 years minimum) contract for the provision of services and required facilities. This Section provides background on objectives, structure and agenda. Section 5 discusses the influence of the agenda upon the process of expertise.

The programme ran over two years (see Table 1). The County drafted an outline strategy as the starting point—*Dealing with Hampshire's Waste—the Way Forward*—but accepted that this would be amended if appropriate, and the detail developed, in the light of the consultation. The immediate objectives of the programme were:

(i) to identify issues and concerns, and
(ii) to provide feedback to the County and Districts on an appropriate strategy for Hampshire.

The core component of the programme, the formation of three Community Advisory Fora (CAFs) (see Section 3.2), had the additional specific objectives of:

(i) acting as an independent 'sounding-board' (the Council's own phrase) for the development of the strategy, and
(ii) providing comment on the range of options for communicating information to the general public.

The County appointed consultants skilled in public involvement work to develop, manage and facilitate the programme. The research that forms the basis of this paper addressed the issue of whether this was the right decision and whether the consultants were perceived to be independent of the County.[17] Of 19 CAF members interviewed, nine (45 per cent) thought

**Table 1.** Timetable and component activities of the Hampshire community involvement programme.

| Timing | Component activity |
|---|---|
| June–October 1993 | Drafting of a strategy document for discussion |
| | Appointment of independent communications consultants |
| | Community analysis and appraisal, and recruitment of Community Advisory Fora |
| November 1993–May 1994 | Meetings of CAFs |
| | Public outreach programme |
| | Revised strategy document produced based upon consultation |
| Summer 1994–spring 1995 | Meetings of the single core forum formed from members of three fora with specific brief to continue discussion with County on key issues |
| | County takes issues raised by core forum into account in considering tenders for the waste disposal service |
| | Continuing general public outreach programme. Large scale on-street survey conducted |
| | County awards the contract for the waste disposal service |
| September 1995–December 1995 | New strategy document produced incorporating proposals of the contracted company |
| | General public consultation using focus groups and interviews. Publicity programme including use of TV personality. Public seminar held |
| January 1996 | Council adopts detailed strategy |

that having someone independent was important and that in general the consultants did fulfil this role; however, five (30 per cent) did not perceive the consultants to be independent. The majority felt that the skills of facilitation and knowledge that the consultants brought to the process were more important than questions of independence, and that these skills did not exist in the County.

The importance of being sensitive to the 'local' context in which information and expertise is used and interpreted is well recognized.[18] A survey of community 'opinion leaders' was conducted by the consultants to provide information on perceptions of waste and expectations of public consultation. Five hundred community organizations were identified that might have an interest in waste management in Hampshire. From this list individuals were identified with a range of community interests: education, countryside conservation, environment, business, parish, health, and ethnic group interests. A telephone survey (46 people) by the consultants identified two 'types' of people:

(i) the *environmentally alert* (the minority) who could consider strategic issues that surround waste; understood the responsibilities of different parties; took a keen interest in technologies, and stressed the need for government legislation to encourage waste minimization, recycling and safe disposal;
(ii) the *non-environmentally alert* (the majority) who did not consider waste beyond their own dustbin; had little comprehension of different responsibilities; seemed to have a concern that waste is 'toxic'; understood little about technologies but were aware of recycling schemes.

Respondents stressed the need to help the general public to understand the extent and nature of the waste problem before starting discussion about the options and potential solutions. The survey also revealed that people wanted information from 'credible third parties'. The conflict background relating to the Portsmouth proposal was not evident in the survey: most people outside of the City were apparently unaware of the issue.

The programme as designed consisted of two main elements: (i) the formation of three groups who would be representative of interests in the community, and (ii) a public outreach programme to inform people about the waste problem and possible solutions.

### *3.2. The Community Advisory Fora (CAFs)*

The formation of a Community Advisory Forum (CAF) in each of the three areas for waste management was at the time unique in this context of public involvement in the UK (although it has subsequently also been used by Essex County Council); and for this reason the CAFs formed the focus of this research. These fora followed models of citizens' advisory committees and panels designed to facilitate a rational discourse.[19] They transfer neither decision-making power nor authority to the public, but they do open the decision to more direct public influence than processes of relatively passive one-way consultation. Optimization of rational discourse requires the provision of an equal opportunity to all those who have an interest in being represented at the discussions.[20]

The selection of CAF members by the consultants was related directly to the initial community appraisal, and was based on a need to have people from the different interests (environmental, business, education, etc.), a good mix of ages, genders and ethnic groups, and people both from the 'environmentally alert' category and from among those who had expressed no interest or knowledge. Some members of the CAFs were recruited from the telephone survey, some following recommendations from interviewees, and others because of their specific involvement in the Portsmouth 'Ban the Burner' campaign.

However, the local members of the national, anti-incineration campaigning group 'Communities Against Toxics' (CATS) remained outside of the organized programme despite being invited to take part. To an extent this supports some expert fears about information provision. CATS continuously fed their own views and expertise into the debate; however, this was by indirect routes, for example, through the media, by arranging their own public meetings, and by distributing leaflets to people as they left the meetings organized by the County. It was not possible to analyse the response of CATS members directly. Examination of their literature and discussions with officers suggests that they did not wish to become part of the County's programme in case this involvement were taken to indicate some agreement with the final decision, which it was clear from the beginning would probably have to include some incineration capacity unless the County decided to send waste for out-of-county landfill. Outside of the process CATS could focus on their own information-provision process and on their anti-incineration message without becoming involved in discussion of other components of the waste strategy, and could remain an identifiable group that the County would need to acknowledge.

Members of each CAF attended as individuals, and not as direct representatives of any particular group to which they might belong. As is common in the use of citizens' advisory committees, they were seen as legitimate representatives of a constituency.[21] The CAFs were not designed to be representative of the socio-economic characteristics of the County, and in practice were over-represented by middle-aged and middle-class people. This was probably inevitable, and is not uncommon to this type of forum: the focus of selection was on people known to have an interest in community and other issues, and the process would

require a time commitment and make other demands on people. Over the period of six months covered by the initial CAF process, individuals reported spending up to 75 hours of personal time at meetings, reading documentation, on site visits, etc.

When interviewed, 55 per cent of the CAF members referred to the 'ordinary man in the street' being largely missing, but then qualified this observation with statements such as 'but it would be difficult to persuade them to take part because it would not be seen as directly affecting them': i.e. CAF members from higher socio-economic groups had more of a 'social interest' or 'duty'. Indeed, 50 per cent of the CAF members said that this was why they had agreed to participate.

Each of the fora was chaired by an independent member of the community selected by the public relations consultants. These chairpersons were chosen for their possible facilitation skills and their respected independence on issues. Their position as chairpersons was open to the CAFs to agree at the first meeting, and one change resulted because it was considered that the proposed appointee had taken a pro-incineration stance in the Portsmouth debate.

As is typical with community advisory committees, group efficiency considerations limited the number of participants. In total, 48 people were selected; two people resigned after one meeting because they were disillusioned with what seemed to them to be only a public relations exercise; and four members were prevented from full participation by work or family commitments. This left a core membership of 42.

The issue of disillusionment warrants further comment here. The specific objective of the CAFs, i.e. to act as a sounding-board, appeared to lack some clarity. For example, the chair of one of the CAFs said that they were 'part of a process which can influence (the County).' The chair of another CAF spoke of members 'feeding back (to the County) their opinions in an advisory capacity.' The Chair of the County Council's Public Protection Committee which would take the final decision on the strategy spoke of 'learning what is important to you.'

A questionnaire sent to councillors and officers (32 people) to ascertain their expectations of the process identified that 67 per cent thought that it was a process of consultation, 10 per cent thought it was only information provision, and 24 per cent (mainly councillors) preferred to think of it as a process of deciding and acting together. When the CAF members were asked of their expectations the majority (82 per cent) referred to wanting to 'influence' the decision which could go beyond traditional, and particularly regulatory, definitions of consultation. However, when interviewed at the end of the process 16 per cent (three out of 19) said that they had started with a cynical view that this was just a public relations exercise and remained convinced of this; 60 per cent felt that there had been an element of a public relations exercise, but they still felt that there had been benefits to the process and were prepared to 'give the County the benefit of the doubt,' as one member explained; the remaining 23 per cent, including two people who referred to themselves as 'converted cynics,' were generally happy that they would have some influence.

Members of the CAFs were paid travelling expenses but no fee for their participation. This is against the trend of similar groups organized, for example, in North America. None of the CAF members interviewed thought that a fee should have been paid: the majority (14 out of 20) felt that this might suggest that they 'were in the pocket of the County.' Others, who stressed that taking part was a 'social duty,' felt that a fee was not appropriate. It is not apparent that the failure to provide a fee represented an impediment to participation, not even among those who were invited to take part but declined. Nor is it apparent that the lack of a fee would have been a barrier to people from lower socio-economic groups if they had been asked to participate. Whether this reflects some deeper national culture relating

to the perceived social role of citizens, particularly in local decision-making, would be an interesting question for further research.

At the end of the CAF process a single 'core forum' was formed of people from the three groups. This core forum had a watching brief on waste management issues generally, and to provide input to the County as the tender process commenced to appoint a waste management contractor. Members of the three CAFs came together for a final meeting at the end of the tender process when the successful contractor was introduced.

### *3.3. Conduct of the CAFs*

Six three-hour evening meetings were held between November 1993 and April 1994. The first and last meetings were 'joint' meetings between the three CAFs as a means first of agreeing the agenda and purpose, and finally of collating the results of the groups. In addition to meetings, site visits to example facilities (in the County, elsewhere in the country, and in Denmark for one CAF member) were arranged, a seminar was held, and each CAF was provided with a resource pack of documentation, videos, etc. This was material either generated by the County or was other published documentation.

Each meeting was facilitated and administered by the staff of the public relations company. A typical meeting started with presentations by officers, which were then followed by discussion. Only CAF members were allowed to ask questions and to participate in the discussion. Although each of the meetings was open to the public and the press, the rules of engagement for these observers prevented participation; however, they were usually asked for comments at the end of each meeting. The average CAF meeting only attracted about 12 observers, mostly elected members from the County and Districts and representatives of waste management contractors. Few 'members of the public' attended—a reflection, perhaps, of the difficulty of engaging people in discussion about strategic issues compared to site-specific issues. At the end of the CAF process a public meeting was organized in each of the three waste-management areas, chaired by one of the CAF members. Again, public interest was low with only 12 local residents attending one and 10 another, with the topic of integrated waste management seemingly attracting little interest. However, a completely different level of public response was forthcoming at primarily anti-incineration meetings: one on dioxins organized by Greenpeace and CATS in September 1994, which attracted about 70 people; and a meeting at Marchwood (near Southampton) where there was local controversy over the existing incinerator, which attracted 300 people in October 1994.

The authority agreed to provide members of the CAFs and of the subsequent core forum with any information which they requested, whether 'for' or 'against' different waste management options. There was an undertaking that every effort would be made to find information. 'Independent' experts were invited to address the CAF members and other members of the public at special seminars. The CAF members were able to suggest which experts they wanted to listen to.

### *3.4. The discussion agenda*

The draft strategy provided a starting point and focus for discussion of issues. It did not foreclose discussion of different options, although the County Council had already made a policy statement that sending waste 'out-of-county' was not acceptable. While the strategy did not have the status of a formal consultation document, the County had identified the problem to be resolved. The legal responsibility of the County (i.e. to manage household waste) defined the limits of the problem. This limitation of remit did present some problems

(see Section 5.1).

The agenda for the CAFs was developed by a steering group consisting of the consultants, County and District officers, and the chair of each CAF. The County had determined that a strategy that emphasized a single option for managing waste was going to be neither the most publicly acceptable, nor the most cost-effective. What was still open to decision was the exact mix of components of an integrated strategy considering acceptable recycling targets and the size of the remaining waste stream. However, there were constraints as to what could be achieved that had to be conveyed to the public: the most immediate was the deficit of landfill void capacity that the County would be facing within five years. Hampshire's traditional incineration bias (reflecting the need to meet the landfill shortages and to deal with non-recycled waste) undoubtedly provided a pro-incineration focus and a view from the County that this should be through energy-from-waste facilities. However, what size these should be, and how many, was open to discussion.

The CAF meetings followed a developing agenda. The first meeting focused on the nature and size of the waste problem in Hampshire, and introduced the concept of an integrated strategy which would follow the waste 'hierarchy.'[22] The subsequent meetings then addressed each of the components/options in turn: waste reduction, reuse, recycling and recovery including anaerobic digestion and composting, energy-from-waste incineration and landfill. There was pressure to get the CAFs to deal with the question of what happens to the residual waste once optimal recycling had been achieved, and also to get them to discuss what was 'optimal' recycling. By the third meeting the CAFs were asked to list their views of the pros and cons of each of the options.

The final joint meeting of the CAFs required them to agree their findings and recommendations. A consensus was not required, but one was reached; the minority view was also recorded.

### *3.5. The public outreach programme*

In addition to the CAFs, the County also ran a public information campaign (exhibitions, displays, media campaigns, telephone 'hot line', newsletter, etc.). It also ran twelve focus groups involving randomly selected members of the public, as a means of broadening the debate and particularly of discussing with different socio-economic groups. Open days were held at local sites, and the County organized public one-day seminars and meetings. The outreach programme was run in parallel with the CAFs and with the subsequent core forum that was formed. It was seen as a component of the same debate.

The outreach programme focused on telling people about the waste management problem in Hampshire. While it did not 'sell' a particular solution, it did focus on a potential integrated strategy. It also focused on trying to get people to respond to the problem with their own views on how waste should be managed. A significant response was achieved to a booklet on managing waste: 44 000 copies were distributed through groups, libraries, exhibitions, etc., and 2000 people asked to receive the newsletter that communicated the waste strategy activities.

Hampshire also conducted a questionnaire survey of 580 people across the County.[23] The responses to the survey largely suggested a majority that could be characterized as 'environmentally non-alert,' as in the initial community appraisal. Although waste disposal was ranked second highest in terms of concerns about issues affecting Hampshire (including road-building, jobs, economic prosperity, house-building), 32 per cent of people did not know what happened to their waste. However, of those who knew where their local recycling facility was, 87 per cent made use of it.

## 4. Expertise at the interface: the research questions

The discussion which follows results from direct observation of the conduct of, and response to, the involvement programme, in particular the CAFs. As identified earlier, a survey of expectations of the process was conducted of officers and councillors. The detailed semi-structured interviews (lasting 1–3 hours) conducted at the end of the CAF process were with a sample (45 per cent) of the participants, and also with officers in the Districts authorities (12 people). I was to provide an independent assessment of the effectiveness of the programme. Four criteria formed the basis of the evaluation: (i) the representativeness of the participants, (ii) the effectiveness of the method, (iii) the compatibility of the method with the objectives of the participants, and (iv) the degree of awareness and knowledge achieved.[24]

Qualitative research is essential for understanding the dynamics of social and decision processes. It provides for understanding of the perspective of the individual through their own words and actions, and over such a comparatively lengthy period allows for examination of the dynamic process of expertise sharing, development and impact at the interface. Questionnaire-based research, by contrast, provides a view of reactions and information demands at a snapshot in time. It may be able to provide the scientific 'comfort factor' of statistical results. However, it is qualitative research which more effectively deals with the context-specificity of public perception and information requirements.

The discussion here expands from the original evaluation to address four general areas relevant to the expertise process. These themes revolve around information selection; information shaping; information balancing and knowledge shift, i.e.:

(i) What information and expertise is selected by members of the public? Is there a gap between what is required and what is available and offered? Do people deliberately look only for information and expertise that will enhance or support their concerns?
(ii) Do demands for information actually change or 'shape' what experts provide, lead to new areas of research and to adaptation of expert understanding, or promote enhanced assessments of risk?
(iii) How do people balance information from different sources? What is the role of 'official' or 'formal' knowledge and information versus the 'informal' knowledge that is part of the on-going social process?
(iv) Is there evidence of knowledge shift as a result of communication?

The focus of the discussion is the CAF process, as this was the most clearly definable (and, therefore, most readily studied) in terms of an expert–public interface. There is still a need to examine the more diffuse and often indirect expert–general public interface.

## 5. Information selection

### *5.1. Information and knowledge requirements*

The discussion agenda (Section 3.4) inevitably underpinned information requirements, which can broadly be classified into two categories: (i) waste reduction and recycling; and (ii) the treatment and disposal options and their impacts. Identification of the range of information required or requested by members of CAFs suggests the broad nature of concerns and information requirements (Table 2). These were not related simply to the potential physical impacts and environmental and public health risks of different waste management options, but also to the status of technology; management experience; regulatory controls; the

**Table 2.** Key issues focused upon by Hampshire Community Advisory Fora.

| Policy and strategy | Operation and management | Technical | Environmental impact |
|---|---|---|---|
| (i) *Following expert presentation* | | | |
| Markets for recycled goods and compost | Effectiveness of enforcement and ability to upgrade required standards over time | Extent to which technologies can meet emission standards now and in future | Hazards of ash disposal |
| Problems in volatility of markets for recycled goods | Opportunity for public consideration of the tenders | Optimization of heat recovery | Effect of scale of facility on emission loadings |
| Evidence of commitment to recycling and minimization | Criteria for judging tenders—in particular relative importance of cost versus environmental issues | Gasification—what is it? Are there other options which could become viable over next ten years? | Odour problems from anaerobic digestion |
| Need for a flexible strategy and the contractual effects of this | Problems of segregation and collection of waste at source | How effective is anaerobic digestion for household waste? | Site-selection criteria |
| Lack of local authority powers to promote waste minimization | | Incineration ash—is it hazardous and what are available treatments? | Effects of landfill co-disposal |
| Lack of County self-sufficiency in recycling and ash treatment facilities | | | Leachate pollution |
| | | | Landraise versus landfill—relative environmental impacts |
| (ii) *CAF-generated* | | | |
| Impact of an energy price increase on energy-from-waste incineration | Whether facilities can be closed down in the event of problems or infringements of licences | Emission problems from incineration of plastics | Relative health and environmental impacts of different options |
| Lack of a policy on hazardous household waste | Opportunities for public monitoring of plant | Calculation of stack height and explanation of dispersion modelling | Long-term health surveillance—experience and results |
| Problems of policy focus on household waste to detriment of consideration of commercial and industrial waste handled by private sector | Opportunities for independent assessment of proposals for facilities and of ongoing monitoring data | Do emission achievements drop-off in older plant? | Health effects of dioxins |
| Problems of separation of strategy from siting issues | Long-term feedstock requirements of an energy-from-waste incinerator and effect on strategy | Effectiveness and use of high pressure waste compaction | Health effects of mercury and cadmium |
| | Costs of each option and affects on costs of integrating different options to different degrees | Need for removal of heavy metals from waste stream | Foetal effects of emissions |
| | | Dioxin formation mechanisms and effectiveness of controls | Validity of models used in emission modelling |
| | | | How are environmental impact in surrounding environment monitored? |
| | | | Why are dioxin measurements only recorded on a six-month basis? |

economics of waste management; and the long-term impact of different policy decisions. 'Pure science' formed only a part of the information that was requested, more particularly in relation to the potential health and environmental impacts of residues and emissions from different treatment and disposal options.

The broad range of questions did not reflect merely the learning process that people were being exposed to through the formal process. Personal knowledge, personal experience (particularly of recycling or of living close to a facility), and exposure to other sources of information including the media and activist groups, were all evident in questioning. The selection of expertise was locally and socially constructed, and, most importantly, was changing and developing through the discussions. Table 2 has been divided into two parts. The first includes some of the issues upon which CAF members focused in the discussion following the presentations by officers: i.e. as a result of information provided to them. The second part of Table 2 includes issues that were not covered in officers' initial presentations, but were largely brought to the discussion agenda by the CAF members.

The issues in part 2 of Table 2 illustrate information requirements resulting from uncertainty:

(i) about knowledge and judgements, for example, relating to health effects, the costs of different options, the assessment of the impacts of different options, and
(ii) about long-term control, for example, whether facilities can be closed or upgraded with changing standards, whether flexibility can be achieved in infrastructure so that new treatments can be integrated later and recycling promoted.

Beyond the gathering of factual information to improve personal knowledge there were four types of expert questioning:

(i) testing of what is known and what is not;
(ii) testing of knowledge certainty;
(iii) examination of the assumptions being used in assessments, and
(iv) requesting information from different parties to test credibility and independence.

Observation of the meetings revealed a large number of demands for evidence to test the expert statements: for example, 'how many times a year is a landfill inspected?' to test evidence that potential environmental pollution will be identified before damage is done; 'which waste management options have not been considered—no one has said anything about landfill as part of sea reclamation schemes?' to test evidence of the thoroughness of the decision process; 'how many times have you taken enforcement action against the incinerator for breaches of emission limits?' to test evidence of regulator vigilance and effectiveness; 'why is it that no long-term studies of the impact on health of local communities around incinerators have been done?' to test the assertion that there is no evidence of adverse effects on public health caused by incinerators; 'which wastes should be removed from the incineration stream to lessen the emission burden of mercury and cadmium?' to test evidence that management of waste throughput is possible; and 'will plants be forced to upgrade emission controls when tighter emission standards are recognized as being required?' to test evidence that long-term control will be possible.

CAF members interviewed at the end of the process were asked (without prompting) to identify the barriers to the effectiveness of the discussions. There was significant agreement among the 19 people (who represented the full spread of interests and of knowledge levels in the CAFs), with up to three issues mentioned by everyone. Firstly, the deficiency of the remit that had been given to the CAFs (identified by 12 out of 19), which reflected directly the compartmentalized decision-making system which had to be maintained by

the County. The remit focused on the management of household waste, the responsibility of the Waste Disposal Authority, rather than including commercial and industrial waste collected by the private sector. Furthermore, no discussion was allowed on siting issues as this was the responsibility of the waste planning authority of the County not the Waste Disposal Authority, and yet the environmental impacts of different facilities and also of the collection and transport of waste were recognized to be linked to site-specific characteristics. The second most frequently mentioned limitation (by 10 out of 19 people) related to the costs of waste disposal and of recycling. Little information was provided by the County about the additional costs of the different options, and, more importantly, about the differential costs of alternative integrated strategies. CAF members expressed concerns such as 'we were being too idealistic in our discussions rather than pragmatic because we did not discuss the costs to the County and therefore to each household.' When asked which was the most important barrier to the effectiveness of the process, 53 per cent identified the failure to understand the costs.

The third limitation, which was mentioned by nine out of 19 people, was the concentration on discussion of each management option in isolation, rather than considering all of the options in an integrated manner and including the relative environmental impacts of different options. The discussion agenda tended to take each option in the waste hierarchy step by step, an approach common to most government publications. When, at the third meeting, CAF members were asked to consider the 'pros' and 'cons' of each option, they could only do this by considering each option separately. A one-day seminar at which different experts presented papers on the options was not organized until after this meeting, and no anti-incineration paper was presented. There were some comments from CAF members that they would have liked to have heard a panel of different experts discussing the relative advantages and disadvantages of the different options. The failure to discuss the integration of options was perceived by some (five people) as suggesting that the County had already made up its mind, and that the CAFs were merely 'rubber-stamping' the decision.

The mismatch between information required and offered arose primarily because of agenda management and the availability of data. The agenda was managed by the steering group, on which the County had an important influence. Although issues were added to the process as a result of requests from CAF members (e.g. health risks and hazardous household waste), and a list of questions was produced at the first joint meeting of the CAFs which included issues of remit, cost and integration, these do not seem to have been dealt with satisfactorily at the time. This is common to citizens' advisory committees, where issues that are important to the public are often excluded from the discourse.[21] This has an effect on the credibility of the expertise process (see Section 5.2). However, it also has to be recognized that the costs and integration of waste options are some of the most difficult topics on which to obtain data and information: at the time, relatively little information was publicly available and some cost-data were subject to commercial confidentiality.

Incineration emissions, and particularly the health effects of dioxins, were not a significant issue at the start of the CAF process: they were only raised in the first round of meetings in the south-east forum which included people from the Portsmouth area, and were an issue generated by the 'environmentally alert' members. It was interesting that in the later focus groups involving members of the public, emissions were more likely to be equated with health problems such as asthma: dioxins were rarely mentioned without prompting. However, dioxins and emissions were to become a significant discussion area, largely because most information presented to the CAFs revealed considerable uncertainty (see the next Section), because groups external to the CAF process (particularly CATS) kept the issue in the public eye, and as a result of the continuing conflicting expert evidence

being produced from North America and Europe. An American academic was brought over by CATS to make presentations on health effects at two public meetings—one in Hampshire and one in the neighbouring county of Dorset. These meetings were reported in the press, and a few members of the CAFs attended (see Section 7).

Health effects of emissions was the only topic for which a dedicated seminar was organized during the CAF process. Then, during the period of the core forum, a round-table was organized which was attended by 180 members of the public (including CAF members), and to which experts from overseas were invited.

Views expressed about the subject in the CAFs covered the full range from no concern, through to concerns which focused on how controls can be achieved, through to anti-incineration views on the basis that safety cannot be guaranteed (i.e. the zero risk option—although this was a minority view). Concerns often reflected social interests and personal experience: compare the views of a lecturer in thermal combustion who had a personal understanding of the incineration process—'if there was a problem with dioxins we would already know about it,' with that of a member of Greenpeace who was anti-incineration—'I do not agree, I do not believe that they (the experts) have looked at the whole issue.' For some people who came to the CAF process with no specific view on the subject, there was some evidence that the conflicting views only served to 'worry' them (the term was specifically used by four people). One CAF member said that they had been impressed by the amount of research on the subject that some of the anti-incineration members of the CAFs had done, and were concerned that 'the County does not seem to have so much information to hand.'

The health effects of emissions were not an area of expertise among the County officers at the beginning of the process. Most information received by the CAF members in the early meetings was either from other published material or from presentations from other experts. At the special evening seminar an expert in environmental health from an independent air-quality monitoring institute provided factual information on emission measurements, on the chemicals emitted from incinerators, and on the effectiveness of plant controls in minimizing emissions. A number of key questions were answered to the satisfaction of the 20 CAF members who attended; the focus of outstanding concern related to the independence of assessments, dispersion modelling, stack height calculation, etc. in the design, siting, and the authorization process. The importance of the foodchain as a route of exposure to dioxins was not considered in detail in any presentation until after the initial CAF process finished and the core forum was meeting, which was almost certainly a reflection of the core expertise of those who gave presentations and the County's own limited knowledge in the early stages.

The knowledge and understanding of waste issues in general (not just incineration emissions) varied considerably among CAF members at the beginning of the process. There was a need to achieve a balance in the process between presentations and discussions which would enable those with less knowledge to feel confident to take part, while also ensuring that the 'environmentally alert' were reassured that discussions were sufficiently in-depth and relevant. Some spoke of 'feeling ignorant' or 'knowing nothing compared to members of the activist groups.' People were personally interested to learn more and were ready to take part in what must be regarded as complex policy, technical and economic discussions. Indeed, when asked why they had agreed to participate in the CAF process, 74 per cent (14 out of 19) said because the subject was interesting and they would like to know more—countering expert views that people lack interest.

The communication process has to provide for the gaining of competence; however, the primary procedural barrier to the effectiveness of the discussions identified by 53 per cent

of the CAF members was lack of time. It appears that the overall length of the process and the time devoted to each meeting were not the primary problems. It was how time was used that people were concerned about: 63 per cent used the phrase 'too rushed' to describe the process, referring to too little time for reflection and for revisiting issues. People wanted more debates between experts and more opportunities for asking questions as opposed to presentations. There was a high dependence upon information obtained through direct communication rather than upon reading to find out: 63 per cent (12 out of 19 people) said that they had read little of the information provided, and that in general there was 'too much paper.' Many faced severe limitations on the time and resources they could devote to learning, although this may change if they were faced with a particular proposal in their area. For the expert, the message that the form and process of communication is important may not be good news. It indicates a need to 'package' information and expertise in a way that people can readily access and interpret.

### *5.2. Expertise and credibility*

A strong theme that pervades the social and cultural literature on public perceptions of risk is that of trust. Social trust is the process by which individuals assign to other persons, groups, agencies and institutions the responsibility to work on certain tasks.[25] Trust is based upon cultural similarity: i.e. we trust people we take to be similar to ourselves.[26] The components of trust include perceived competence; objectivity (i.e. lack of bias in information); fairness or procedural equity (i.e. acknowledging all relevant points of view); consistency; and 'faith' (i.e. a perception of goodwill in composing information).[27]

Analysis of who was looked to as a provider of expertise identifies a range of perceived experts: officers from the decision-making authority; environmental consultants; representatives of the waste-treatment industry; and health experts, academic toxicologists, and regulators from the UK and from overseas. Although the County Council officers and elected representatives held decision-making responsibilities, it was evident that expertise as measured by technical knowledge and scientific understanding was not *expected* to be held among these people, except in relation to matters that were the direct responsibility of the County and Districts, such as collection systems and recycling. Expertise among officers was hoped for, although the public did not expect them to be able to answer all of their questions without further enquiry. Officers were seen more as generalists, whose expertise was related to their need to receive and balance diverse information as input to the decision process. One member of the CAF expressed his surprise and also his satisfaction at 'the very apparent efforts by the officers to take decisions based on the all of the information'—perhaps indicating the lack of credibility that the County had faced at the beginning of the exercise. When asked about the input of officers 74 per cent (14 out of 19) of CAF members across the spread of interests and knowledge indicated that they felt that officer input had been 'balanced.'

There was evidence of intuitive scepticism about risk messages: CAF members were aware that the thrust of these messages can be predicted from the political agenda of their sources; and that presenters of messages can package information to convey a message favourable to the interests they represent.[28] CAF members wanted 'independent' and 'specialist' evidence wherever there appeared to be uncertainty of knowledge, or disagreements in the literature, or just no local experience (for example in relation to anaerobic digestion). A few members of the CAFs identified that no-one, and hence no expertise, is completely independent: as one person explained, 'everyone has a paymaster at the end of the day.' This included recognition that academics increasingly have paymasters

and can not necessarily be viewed as independent. However, the issue of independence and of divergent views from different experts did not seem to affect the ability of individuals to balance information (see Section 7).

The importance of credibility of information was translated into the final conclusions of the CAFs, and into their concerns that any facilities that are built should be monitored. The CAFs requested that the authority use public money to employ independent monitoring consultants, which would be in addition to data collection by the regulatory body and the operator of any facility. In the final report of the CAFs there was also a request that monitoring information should be open to public scrutiny and involvement. Information that would be provided by the operator, although regarded as important as the first source of local information, was also viewed as potentially being 'doctored' to provide reassurance and to hide any problems (this is similar to the public's experience, as reported by Irwin *et al.*,[29] in relation to the chemical industry). Information from the regulator was regarded as potentially deficient because of insufficient monitoring. Some expressed the view that 'the regulator is in the pocket of industry'—a view which has been reiterated in more recent waste-management discussions.[30]

Table 2 identified uncertainty as a significant issue. The primary problem seemed to lie in the caution that experts adopted in explaining these uncertainties, and the evident difference of opinion between experts as to their significance. The problem was exacerbated by the lack of time to explore the differences. CAF members chose to increase efficiency of discussion and to manage uncertainty through requests for panels of experts and public debates between experts. The County did organize the round-table on health risks, following criticism from CAF members that the public meetings being organized by CATS were not being challenged, and that this was resulting in 'a loss of credibility' for the County.

The search for available information to feed the concern over the mismatch between the demands for, and the availability of, independent expertise was highlighted when one member of the core forum walked into the evening session to discuss the environmental impact of incineration with a copy of the summary volume of the draft US Environmental Protection Agency's (EPA) report on dioxins,[31] with pages marked where they had questions. This was only a few days after the report had been released, and the authority did not have its own copy at the time; there were no experts in the room who could talk to the report. Information in this context was moving from the bottom up, rather than from the top down. It was probably the most telling example of an information 'gap'. It also highlighted the increasing ability of interested members of the public to access information with relative ease from sources worldwide—an ability that is likely to progress exponentially over the next decade. Expertise is no longer the prerogative of the scientist or technical expert.

The waste industry itself was rarely mentioned as a possible expert source of information on the impacts of emissions. There seemed to be an inherent, almost subconscious, understanding that the industry may not be the primary source of expertise. Even if it is, for example in relation to the operation of facilities, its messages would be primarily ones of reassurance rather than of science.[29] However, responses to the success of the site visits were tempered by the realization that the information being provided was biased in the case of only two out of 13 people. The opportunity to 'see with my own eyes' seemed to outweigh any reassurance element inherent in the provision of information.

Individual performance impacted upon perceived organizational credibility. A telling example of this was in the performance of a representative of the regulatory agency at one of the public meetings. The individual appeared unprepared for the questions, could not provide accurate information about the last inspection of one of the incinerators in the area, and was not able to address fully some technical questions about the plant. In general, it

appeared that the expert was trying to offer reassurance rather than prove capability. In a short space of time, the credibility of the regulatory process was called into question by those who had no prior views, and a perceived lack of credibility was reinforced in the eyes of those with existing prejudices.

## 6. Information shaping

Public questioning of health risks influenced directly the authority's decision to send officers to the USA, to meet with the authors of the draft dioxin reassessment and to elicit answers to questions raised in the CAFs. This was facilitated by the independent consultants who were organizing the public involvement programme, and who had extensive contacts in the USA. At the round-table seminar on health and emissions issues organized in February 1995, the authority invited two experts from the USA to give presentations: a physician in occupational and community health who had transferred to the EPA for three years to work on the dioxin study, and an environmental consultant who had worked with citizens' groups in the USA and had served as New York City's expert on incinerator emission control technologies. Despite strenuous efforts to find UK academic experts to speak on health risks, none had been willing to attend: they cited conflicts of interest in working for the incineration companies, or an unwillingness to discuss unpublished work. Information and expertise was being shaped by public questioning, but there was a definable gap in the willingness of the experts to deliver.

While the health risks of incineration emissions were a topic where information was required, the discussion in public soon focused on the apparent deficiency of knowledge about the *relative* health risks and environmental impacts that might arise from different waste-management options (as discussed in Section 5.1). There proved to be no published UK information, and by the end of the CAF process it was identified as one of 'the important issues which had not been adequately addressed,' according to the report of the public relations consultants to the County. The County Council's scientific officer was given a specific brief to investigate the issue. It is not apparent that this step would have been taken in the absence of the CAF questioning.

There were some topics that took on a higher profile in the CAFs than the County had planned: these were waste minimization, for which the authority has no direct responsibilities, and the management of hazardous household waste, which had not been considered as a specific issue and over which there was no administrative or regulatory control. Both illustrate the public frustrations that become apparent when control systems appear to artificially compartmentalize issues. The CAFs' concern over the compartmentalization was largely responsible for the setting up of County working parties on waste minimization and hazardous household waste.

While understanding of waste management issues was significantly increased among those people who took part in the process (see Section 8), it is equally true that expert understanding of public concerns was also significantly shaped, most particularly within the authority. The following are just some views as expressed by officers during interviews:

> 'The process has been beneficial in helping us understand what people want to know and what they expect of us.'

> 'The CAF members have been challenging.'

> 'It is hard work for the County to look at things without a bias—community consultation has forced us to slow down and to reflect a bit.'

This last comment above all shows the potential for the learning process at the public–expert interface if appropriate methods of discussion and debate are adopted. However, it might be seen as a significant challenge to the traditional expert view of their relationship to the public.

## 7. Information balancing

Members of the CAFs seemed to be capable not only of assimilating and balancing different sources of information on the same topic, but also to *prefer* to have different sources. There was an inherent belief that since there was no right answer to many of their questions, only different opinions, it was important to listen to as many opinions as possible. At the first CAF meeting members were asked how they wanted to gain information. The requested options illustrated this perceived importance of multiple sources and opportunities to challenge expertise: for example, the seminar to address 'state of the art' technology; site visits to look at what was currently being done in the County and to other sites to look at what would regarded as best practice; videos showing operational experience of options for managing waste not currently used in the UK, and briefing papers prepared by officers but forming a collation of views and information from different sources. As reported in other similar public involvement programmes,[32] those who were able to go on the site visits enjoyed the didactic value of and opportunity to question experts, and most of them were concerned that there should have been more time devoted to questioning the experts.

To illustrate their views and to request information, people frequently drew upon direct personal experience, for example of recycling; upon observations from visits to other countries or evidence from friends and family members who lived elsewhere in the UK or abroad; and upon information they had seen or heard in the media. Most of this evidence was used to test experts as a means of questioning assumptions or information which seemed to be in conflict with views they had gained from elsewhere.

Personal and socially constructed information was important in the balancing process, but there was some evidence that where credible expertise was available that could offer 'solutions' that enhanced the potential public control over risks, this expertise was influential. For example, the issue of the environmental assessment of proposed developments had been particularly familiar to those in the Portsmouth area as the Environmental Statement which had been submitted with the proposal had been subject to exhaustive scrutiny, but with different consultants often reaching conflicting conclusions. Criticisms of the Statement included concerns about the modelling of air emissions and the apparent failure to address the worst-case scenario. This background was brought to the CAF process. An explanation of the approach to the risk assessment of emissions that could be encompassed within an Environmental Statement and subject to public scrutiny and testing of assumptions, as was happening in at least one contemporary siting process, provided an element of reassurance, and resulted in an undertaking from the authority that this would be done.

Three members of the CAFs who attended one of the meetings organized by CATS where an American academic spoke on the health risks of dioxins, expressed concern that the County officers seemed to have neither the information nor organizational networking capacity to respond. They said that the authority should have asked the same expert to attend a County meeting to debate with other experts. The County's relationship with CATS was primarily one of a 'watching brief,' reflecting the group's refusal to take part in the public involvement programme. There seemed to be a reluctance to counter the arguments presented by CATS directly and in public, with the County remaining focused on its own messages. The members of the CAFs were concerned that the activists were

packaging messages favourable to their own interests which might sound convincing to members of the public who did not have access to other information sources, including the information available to the CAFs:

> 'People are being worried on false grounds.'

> 'The rumours must be on the table but I am concerned at what I heard as it was contradictory but few people in the audience countered it.'

'Extreme' views expressed within the CAF process seemed to be manageable through discussion and the evident process of information balancing which people were prepared to adopt. There was a clear distinction made between the processes of group value elicitation and accountability which is possible in small groups, and the difficulty of countering and challenging 'extreme' views in the larger public fora. In these sentiments many experts will find a sympathetic tone relevant to their own concerns about public meetings.

## 8. Knowledge shift

All of the CAF members who were interviewed, including the environmentally alert, indicated that they had not only increased their personal knowledge considerably, but also now knew how much more they still did not know. Most people were able to discuss waste management issues with a far broader perspective than at the beginning of the process, many to a greater degree of expertise than some of those who would be taking decisions within the County. Some were asked to explain the waste management life-cycle, and it was clear that they felt more confident about their ability to discuss the links between recycling and disposal and the factors influencing the choice of different options. The majority of people (79 per cent) said they had 'enjoyed' learning.

However, it is difficult not to conclude that this learning process might have more personal benefit than direct impact on the general public. Given that CAF members did have different community interests, there had been some hope among the County that they might be able to disseminate information. A few people did take copies of videos and information packs and gave presentations to their respective groups and organizations on the waste management problems facing the County. One CAF member who continued on the core forum developed a 'thrift badge' for her Brownie group, using some of the literature from the County. In general, dissemination activity focused more on the less contentious and knowledge-demanding topics such as recycling; these were also the topics most readily transferrable to personal experience.

Some anti-incineration views were placated through information on the controls, design and operation of modern plant. One CAF member said that the visit to the new South-East London Combined Heat and Power plant had 'completely changed' his anti-incineration views, which had been predicated upon experience of one of the old Hampshire incinerators. However, in contrast, another person in favour of the technology of incineration reported 'being shocked' on the same visit over the scale of the plant in its urban setting 'which must not be allowed to happen in Hampshire.'

The strongest, most developed, anti-incineration views were held by some of the environmentally alert. Since they were already relatively well informed, it was unlikely that their views would be modified by access to information about technologies, controls, emissions, etc. There was some evidence that anti-incineration views equated with 'egalitarian worldviews,'[33] but it was not possible to test this in the research.

However, there was evidence that through the CAF process this minority had 'learnt to understand other people's point of view,' as one of the 'Ban the Burner' campaign members

explained. Effective public involvement should promote 'social learning' encompassing both the acquisition of knowledge and 'moral' development, i.e. being able to take on the perspective of others.[34] However, the mechanisms and timescales required to achieve this differ considerably from the traditional view of top-down consultation, as is evident in the costs and timescale of the Hampshire process.

Within the CAFs a consensus was reached about the need for an integrated strategy and about the role of energy-from-waste incineration within that. A small minority (about five of the 42 active CAF members) remained opposed. Others still concerned about incineration, and particularly about the need for rigorous assessment and control, came to the conclusion that a zero-risk option was not tenable: there is a limit (physical and economic) to what can be recycled and there will always be a residue of materials that require disposal. The majority view could be described as cautiously pragmatic, and there was evidence that the process of expertise had assisted in this realization. The CAF conclusion about incineration might seem to reflect the results of the general public survey,[23] which showed that 73 per cent preferred incineration over landfill, but that 67 per cent would be 'very concerned' or 'concerned' about an incinerator in their neighbourhood, with emissions being the main reason for concern (59 per cent). However, there was some evidence that, in the CAF process, views reflected a more sophisticated balancing of risks and benefits. It will be interesting to observe whether this balancing process is still possible at the siting stage.

## 9. Interrelationship with decision-making

The County agreed that it would listen to, and take on board, the recommendations of the CAFs, and also any other comments received from the general public. The CAFs' report of their conclusions was presented to the Waste Strategy Panel and to the County's Public Protection Committee. The conclusions were listed under each of the options for managing waste. Minimization activity was seen as a significant issue that had not been fully recognized in the implementation plans because of the authority's lack of regulatory responsibilities. There was pressure for the County to take on a stronger lobbying role with government, industry and the public. On recycling, the CAFs indicated that the national target of 25 per cent should be seen as one to be surpassed, although, as indicated in Section 5.1, with the failure to address the issue of costs it is not clear that the conclusions were based on a full view of their likely acceptability. Commitment to too large an incineration capacity was concluded to be potentially damaging to the goal of increasing recycling over the long-term (although evidence to the contrary had been presented to the groups). Primarily for this reason, but also with regard to environmental impacts, the CAFs concluded that 'small-scale' incineration facilities (i.e. less than 200 000 tonnes—half the size of the original Portsmouth proposal) should be developed. Anaerobic digestion, where suitable, was thought to be preferable to incineration. Landfill was the least preferred option, although it was recognized that there would be a continuing need for some capacity.

As a result of the conclusions of the CAFs, and in particular of the minority anti-incineration view, the County specifically required the companies who tendered for the waste contract to include a no-incineration option. However, as the tender process was entirely confidential, the nature of the proposals on this matter and how seriously they were taken by the County were not known. Furthermore, in the light of the shortage of landfill void space, an in-County landfill option to deal with a significant proportion of the waste was not possible, and no other available waste management option can deal with the full components of the stream. The no-incineration option specification recognized anti-

incineration concerns, but it may not have been perceived as a genuine alternative opiton. The County also required details of a public involvement programme that would operate not only at the siting stage for any facilities, but also during operation, following CAF requests.

The short-listed tenderers attended a special session of the core forum to listen to concerns, particularly about openness and communication and about maintaining flexibility in the waste management system. This was the first time that the waste companies had any opportunity to express views, being largely passive observers until that time. The successful contractors presented their proposals to the core forum and to members of the initial CAFs who had been invited back to hear the proposals. At this time the CAF members' views about the difference between their understanding and that of the general public crystallized into a recommendation that the contractor should commence contact with local communities immediately.

## 10. Conclusions: optimizing the process of expertise

This case study provides evidence that the adoption of proactive discourse methods at the technical–democratic interface can enhance the process of expertise. At the technical–democratic interface there is the potential for friction but also for learning, by both experts and the public. While a member of the public may not have the time to devote to 'learning for the sake of learning,' when faced with an issue of concern to them they will take an active role in finding out information to help them to feel that they have some control over the situation; they enjoy the learning process; and can access, handle and balance complex information if given sufficient time. The public are not information-poor: they can capitalize upon a range of cultural and experiential resources.

The waste management debate at the local level reveals that there is no single expert or science. There is no 'right' answer. Members of the public are inherently aware that there are degrees of expertise from the general to the specific which are key to the decision and which are to be used as appropriate. The experts at the interface are there to provide information, they are also there to be challenged and tested. People want opportunities to hear and test the range of opinions and science: indeed, there is evidence in the information shaping in the Hampshire process that members of the public can act as quality assurers in the risk management process.[35]

Contrary to expert fears, it is evident that when scientific uncertainty or lack of expertise is openly acknowledged, and when management mechanisms to deal with the situation are explained, demands for zero-risk options are not forthcoming from the majority, and experts are not rebuked. Members of the public who have an opportunity to address issues in an informed manner are willing and able to balance risk and benefits.

It is the credibility of the expert that is at least as important, if not more important, than his or her knowledge. Credibility is gained by personal and organizational performance, by evidence of independence, and by evidence that the expert is acting with the interests of the public in mind. It is the process of interaction with the expert that provides the opportunity for credibility to be either lost or enhanced.

Optimizing expertise as a process at the interface provides the best opportunity to enhance social learning and to manage controversy in risk management decisions. We must use and adapt models of rational, non-adversarial discourse to provide a means of optimizing the process of networking which is inherent in the expert–public interface. This study has confirmed that there are a number of opportunities and barriers:

*Opportunities*

- Members of the public are interested in taking part if they can see that the issue affects them and that decisions have not already been made.
- If given access to all of the expertise that they require, the majority are willing and able to balance information. Individual 'expertise' is enhanced.
- Inclusion of people with developed views either 'for' or 'against' a technology does not bias discussions which are managed to ensure that values are elicited and made accountable. Participative discussion fora can lead to extreme views being 'managed' and can enhance interest mediation.
- Experts are challenged by public questions, and gaps in expert knowledge are identified. If responded to positively, this can lead to enhanced expert technical understanding.
- Public involvement can act as an effective quality assurance mechanism in risk assessments. The public's role in this context is increasing with the enhanced opportunities for access to information offered by global information networks.
- Expert credibility is enhanced by a willingness to admit to, and explain, uncertainties.

*Barriers*

- The additional time and resources which are required.
- Traditional local decision-making processes tend to preclude discussion by making decisions before discourse is commenced.
- The 'artificial' compartmentalization of decision responsibilities and limits of remit inhibit broader discussions.
- There is a perception that representative democracy already provides for public concerns to be addressed.
- There is continued reluctance among some experts to accept that 'objective science' is rarely, if ever, the primary influence upon public reactions.
- There is a lack of 'experts' who are prepared to contribute to public discussion on some subjects.
- Experts are unwilling to admit to uncertainties in the public domain.
- Experts fail to accept the range of expertise which becomes important in any local debate—there is rarely 'a right view'.
- Authorities fail to organize effective debates between experts to allow the public to understand divergent views and to balance information.
- There is an apparent lack of perceived independent expertise in some subject areas, and an apparent lack of trust in some regulators/decision-makers.
- Experts can be ineffective communicators, concentrating on messages of reassurance rather than on evidence of capability.
- Some extreme, activist groups refuse to take part in the discourse process. Their networking separate from the main information flows must be responded to rather than ignored.

At the time of writing the Hampshire debate is moving to the process of siting specific facilities. There will be renewed debate as public and personal interests are threatened. New expertise will emerge, and the networking processes will change to reflect new social and cultural contexts. This challenges an expert preference for 'one-shot' communication. The greatest challenge at the interface in local decision-making is to provide on-going opportunities for rational discourse.

## Acknowledgments

The author acknowledges the support of Hampshire County Council Waste Disposal Authority in this research, and particularly of the members of the public who participated. The original research that formed the basis of this paper was carried out under contract as part of the New and Renewable Energy Programme, managed by the Energy Technology Support Unit (ETSU) on behalf of the Department of Trade and Industry. However, the views and judgements expressed in this paper are my own, as are any errors of interpretation.

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