E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

science in society

End of Award Report
Using Public Environmental Knowledge in Industry

1. Background

The desirability of incorporating lay knowledges in environmental decision making, whether for substantive, normative or instrumental reasons (Stirling 2004) is now widely acknowledged.

Research on use of lay knowledge has concentrated on the public sector; this project focuses on the private sector. Incorporating lay knowledge in these two spheres differs in important respects (Chess 1999, 2001, Udo de Haes et al 2002). In addition much of the value of lay environmental knowledge has been demonstrated around local identities and place based experience. (Irwin & Wynne 1996). How does this relate to the relationship between industry and the public where 'experts' are company executives and lay people are consumers of their products and neighbours of their factories? Consumers may have experience of the product in use which differs from information gathered in laboratory conditions (Wynne, 1989), and neighbours may have access to information of the local impacts of factory operations (Brown: 1993; Irwin: 1995). In addition publics may make valuable contributions about social values and managing uncertainties and by questioning the management, use of and priorities for science (Wilsdon & Willis, 2004) .

While the rhetoric of public engagement is increasingly commonplace within industry (partly as a result of the Corporate Social Responsibility agenda) there have been few investigations of how lay knowledge is conceptualised and whether it is used (but see Doubleday: 2004).

Taking the chemicals sector as an example, our research explores how companies conceive of 'the public and 'public environmental knowledge', and how this relates to ways in which they access and use such knowledge and seek to interact with the public.

2. Objectives

1. To identify how public environmental knowledge is conceptualised and used within industry

2. To identify what motivations and barriers exist for companies to make better use of lay environmental knowledge as part of their corporate social responsibility

3. To evaluate the relationship between organisational functions and use of lay environmental knowledge

4. To develop recommendations as to how lay environmental knowledge can be incorporated more effectively within industry

5. To develop recommendations for Non Government Organisations and members of the public on how they might improve the efficacy of their interaction with the corporate world.

6. Develop a large data set on the use of public environmental knowledge accessible to future researchers.

    - Section 4.3. discusses our findings in relation to these objectives.

    - We have sent our survey data file to the ESRC data archive.

3. Methods

It was necessary to select a broad industrial sector for study. The chemicals sector was selected, because it is characterised by complex interlinked supply chains leading to a range of consumer products; it includes companies ranging from small to multinationals, with many business-to-business (B2B) transactions as well as business-to-consumer (B2C) sales; it is currently being required to re-engineer business processes as a result of external pressures, notably the EU's REACH (Registration, Evaluation and Authorisation of Chemicals programme);and yet it has been studied less than other sectors. Prof. Clift was involved in the project specifically because of his familiarity with this sector. Within this broad sector, specialty chemicals/cleaning products were selected as the focus for the research.

3.1 Interviews

Interviews were conducted in four companies, selected on two criteria: whether they are B2C or B2B, and size. We anticipated differences in engagement practices and views of the public according to whether the company sells to the public, and between small and large companies because of differences in resources, legal frameworks within which they operate, public visibility and organisational structures.

Business-to-Business large (B2BL)	Business-to-Business small (B2BS)
Business-to-Consumer large (B2CL)	Business-to-Consumer small (B2BS)

34 semi-structured interviews were conducted (4-12 in each company, number varying with company size). Interviewees were senior executives from marketing, R&D, public relations, production, management and health and safety. Interviews explored definitions of the public, characterisation of public environmental concern and knowledge, communication with the public and policies of corporate social responsibility and sustainability.

Interviews were transcribed in full and analysis facilitated by WinMax software.

3.2 Survey

A questionnaire was developed to test hypotheses generated from the interviews, piloted extensively and then sent out with a letter of support from the Chemical Industries Association (the relevant industry body). Data were collected on patterns of interaction with the public, how relevant different publics were to the company and attitude items assessing willingness to engage, qualities of the public and barriers to engagement (Annex 1).

A data-base of 971 chemical companies (selected using US 1987 SIC codes, (Annex 2)) was purchased from a commercial list-manager. We focused on companies in product areas similar to those targeted in the interviews (rather than surveying various industrial sectors as initially proposed) as this gave us the best opportunity to build on our qualitative findings. All were contacted by letter then telephoned. After extensive follow up calls 261 (27%) participated. Non-respondent companies were not significantly different from respondents in size or commercial profile.

The survey was administered by telephone to one representative in each company across: senior management, research & development, environment, health and safety, sales and commerce, communications & external relations and corporate affairs. We decided to interview just one person from each company in order to include as many companies as possible in the sample giving diversity of company size and sector (see Q6 on ESRC questionnaire).

4. Results

4.1 Interview analysis

Who are the public for industry?

Interviewees rarely used the notion of 'the public' spontaneously; more readily talking of 'consumers' and/or factory 'neighbours'.

Some of our interviewees drew on the discourse of a heterogeneous public (Rayner: 2003, Petts: 1994) and the idea of individuals having multiple roles and responsibilities was recognised by some interviewees in our large B2C company.

Ideas about 'the public' were linked with ideas about public opinion - they were described as 'a silent, strong force' and the bearers of opinions and values which might impact upon the company. Respondents drew on ideas about individuals acting within the public realm; 'the man in the street' rather than the consumer within the supermarket or private individual within the home. While drawing on notions of people as citizens this term was only used by employees within the large B2C company.

For the two B2C companies, the public of primary interest were their consumers. In the large B2C company almost everyone was thought to be a consumer of their products prompting a clear interest in understanding the variety of public concerns, interests and priorities. In contrast our small B2C company identified their consumers as a specific (older, richer, better educated, greener) subset of the public.

We expected that B2B companies would be less likely to focus on consumers as they do not sell directly to them. For our large B2B company, however, the picture was rather different and suggests that closeness to consumers should not be understood simply in terms of the number of links in the value chain but may also be influenced by the nature of the product.

For the small B2B company consumers were conceptualised as too far away to focus upon, however, they, had a much closer 'public' who were of concern to them – factory neighbours:

> The public I see as our neighbours so that's going to be any local residents, it's going to be any local companies that are adjacent to us, anyone in the vicinity is the public to me (B2BS 3)

Neighbours were also acknowledged as important by the other companies.

Characterising public environmental knowledge

The notion of lay environmental knowledge had almost no resonance with those we interviewed. The public were conceptualised not primarily as bearers of environmental knowledge but rather as people who may present concerns and complaints.

Respondents emphasised the basis of their knowledge in science contrasting this with the self interested basis of public concern:

> I think that people generally speaking are, and I don't mean this in a nasty way but are pretty self-motivated, a little bit selfish and are, are only girded into action when they can see you know the direct impact on them or their loved ones (B2BL 5)

Media coverage and NGO activity were identified as shaping public attitudes. Respondents were negative about media content, depicting it as partial, superficial and preferring bad to good news. A linear model of knowledge transfer was assumed in which the public are depicted as passive recipients of biased media information. NGOs were seen to influence media messages and ultimately public opinion:

> I think the concerns are, to a great extent, raised by NGOs and they feed the press and the public (B2BL 6)

All the influences on public concerns were presented as essentially negative or misleading. There was little sense that the public may have prior knowledge, draw on multiple sources of information or actively evaluate information.

Interviewees in the B2C companies downplayed the extent and significance of consumers' environmental concerns. Consumers were thought not to prioritise environmental issues being more interested in whether products worked and were reasonably priced. They also argued that it was the company's responsibility to ensure that products met health, safety and environmental regulations so that consumers need not have concerns over the environmental impacts of purchases. Consumers were depicted as having relatively superficial 'soft' knowledge about the product and not wanting 'hard' scientific understanding.

Neighbours' concerns were thought to focus on factory 'nuisance' (e.g. noises, smells, traffic). They were often described as 'perceptions'(in contrast with the 'reality' known to industry scientists) based on immediate sensory experience which was considered an unreliable source of information about risk.

Concerns about specific local hazards were sometimes seen as underpinned and amplified by more fundamental suspicions about the industry:

> If you take the views of our local residents…their concerns are a perception that industry is the dark satanic mill, …there is an almost a cloak and dagger perception of industry that they have, something secret going on, something nefarious that looms at night when no one can see and this sort of stuff …there's a massive level of ignorance about what industry does (B2BS 2)

Shades of the deficit model

Research in the public understanding of science initially assumed ‘deficit models’ of public understanding, in which the public were characterised as ignorant, requiring education to provide correct information about science. Such models have since been criticised by research which has illustrated the complexity, consistency and validity of public(s) beliefs; demonstrated the public’s capacity to assimilate complex scientific information when it is in their interests to do so and highlighted the circumstances in which ‘ignorance’ of science may be a rational position (see Wynne, 1992; Irwin & Wynne, 1996). However we found that the idea of a public deficient in scientific and environmental knowledge remains pervasive in the chemical industry.

Respondents in the small B2B company characterised the public as ignorant of the chemical industry and described how they tried to address this:

> we .. open the door and let people in ..the Open Day we did last year that was open to anybody to come to that and see and they get a tour to give them more of an insight...So we’re not the scary, scary place down the road…and we’re not all mad professors in labs …that’s what they expect. (B2BS 1)

The role of education and information is seen here primarily to address deficiencies in public understandings of scientific process and in the trustworthiness of scientists. Reframing the problem ‘as one of lack of trust rather than one of irrational public conceptions of risk’ (Owens 2000:1142) might be seen as an acknowledgment of the fundamental role that lack of trust in the institutions responsible for managing risks plays in public assessments of risk (Wynne,1992). Notions of an ignorant public remain, however, and are extended rather than replaced. Lack of trust in the industry is characterised as further evidence of ignorance and irrationality.

The characterisation of public understanding of the science behind products and their potential environmental impacts (what’s in it, how it’s made, impacts in production, use and waste) was more complex. One dimension of the deficit model was evident; the public were seen to lack knowledge and not know ‘the facts’. This ignorance was, however, often seen as something that need not be rectified; the ‘providing information and education to fill the gap’ component of the deficit model was absent. Instead consumers’ deficits of knowledge about the science behind products were explained by arguing that the science is ‘terribly complex’ (it is unreasonable to expect the public to grasp it), and by emphasising the company’s responsibility to ensure that their products were responsibly produced so consumers need not have knowledge about their purchases. In addition deficits of knowledge were justified by questioning why anyone would want to acquire such knowledge – our respondents argued that their products were not interesting to the public:

> They buy them and use them every day but I don’t think they give them a lot of thought (B2CL 2)

An alternative to deficit models of public knowledge was presented by some interviewees in the large B2C company who acknowledged that lay people may have different, but valid perspectives:

> your scientist tries to objectify and quantify and put numbers on it so it’s one death in a thousand, the lay person interprets the information differently, ‘well I don’t care how many it is, one is too many’ and that’s a more emotional

> response, it's still valid and it's still an important consideration in what we do (B2CL 3)

Constructing publics and engaging with them

In this section we summarise how the companies communicated with and engaged with their publics and highlight how this relates to the ways in which those publics are constructed.

B2C companies had a range of ways of communicating with consumers. Both emphasised the role played by their carelines (telephone numbers provided on product packaging for consumers to call) and websites and depicted the majority of contact through these channels as coming from consumers and focusing upon the product. Publicly initiated communication about issues going beyond the product (e.g. company conduct, environmental record, animal testing) was reported as rare and coming from students or activists with a particular use for such information.

Most consumers contacting companies were not thought to want dialogue with the company or to have an influence upon them; rather they were seen as wanting to make their point, gain advice, information or recompense. If public contact is understood in this way, then engaging with the public is seen more in terms of making sure that people feel that they are being taken seriously and allaying their concerns rather than as a potential source of new ideas or useful knowledge for the company.

Both B2C companies carried out market research. The large B2C company, however, had also sponsored research aimed at developing a more sophisticated understanding of peoples' values and concerns.

'Neighbours' interests were always seen as local. This public was not viewed as also being consumers, activists or citizens with the interests that these entail. Irwin and Michael argue that: 'lay publics can no longer be thought of solely in terms of embedded local communities: as if they were separable from larger social forces and changing cultural patterns' (2003: p85), yet this is almost exactly how the B2B companies talked about their 'neighbours'.

Understanding of local concerns is developed through the interaction company representatives have with local people in public meetings, but also through 'outreach' such as open days, social events, working alongside local charities, working with schools, being involved in local development forums and environmental initiatives. Such forums may provide opportunities for building trust and exploring issues which go beyond the concerns which 'neighbours' are assumed to have.

When viewed as 'consumers' or 'neighbours' then it seems that the public are not typically regarded as a source of either 'facts' or broader 'values', 'which might shape company thinking and practice (Irwin & Michael 2003: 8). This is not, however, to say that broader lay environmental knowledge is not taken seriously by companies, but rather that it is only recognised when it comes from a perceivably more powerful or organised public in the guise of NGOs or other stakeholders:

> I don't think that in fact that lay environmental concerns would be enough, I think it would be environmental concerns by people who are a bit more informed and a bit more vocal who can actually do something, who can say well actually we think this isn't right or wrong and what are you going to do about it but it may make a difference to something that (company)would do.(B2CL 4)

Barriers and motivations for public engagement

Some respondents acknowledged that public engagement might have 'business benefits' particularly 'making you stand out from your competitors' and providing positive brand image. However they also identified such processes as potentially costly, time consuming, difficult and also risky through raising unrealistic expectations. Embarking on a serious process of public engagement takes companies into new territory: an understandable reaction from interviewees was 'is this really our job?' The obverse problem of assessing the legitimacy of lay participants was also raised. Members of the public were characterised as relatively uninterested in engaging with industry. This is a clear barrier to public engagement; it is not only companies but also the public who need to see the benefits (Gregory, 2005). The fact that little public engagement was taking place was cited by some as evidence that there is little demand for it.

We looked for examples of the substantive use of lay environmental knowledge within industry, by asking interviewees whether they could think of any instances when something had changed within the company because of ideas, concerns or questions from members of the public (whether or not these had been formally elicited or spontaneously volunteered). Few could think of any such instances. However, participants suggested that lay environmental knowledge *might* result in substantive changes (beyond changing features of the product) in certain circumstances: if people were raising health and safety concerns; if enough people made the same complaint; if official bodies or influential individuals involved; if the issue received media attention or affected the company's market.

4.2 Survey Analysis

The Sample

78% of the companies in the sample classified themselves as B2B and 7.3% as primarily B2C. 14.5% adjudged their company as being both B2B and B2C. This is a fair representation of the sector.

Sales are used as the proxy for company size. The number of companies within each category are indicated in Table 1 (Annex 3). The majority of firms (52.3%) reported less than £5m turnover p.a. in the last year of reporting. However, larger firms reporting £100m+ are still well represented (10.3%) which is significant as these companies are likely to be more visible to the public.

34% of survey respondents were senior managers (reflecting the large number of smaller companies in the sample), but a significant proportion also came from Commercial (12%), and Corporate Affairs generally (17%). Those who professionally might be assumed to deal with lay people (Communication and External Relations) constituted a small minority (4.2%) (see ESRC Questionnaire Q6).

How relevant are the public to industry?

We asked survey respondents about the relevance to their company of the public as 'consumers', 'neighbours' and 'NGOs'. We used the category of NGOs as a proxy for the mobilised public opinion and influential stakeholders mentioned by our interviewees.

- Both B2B and B2C companies were often willing to acknowledge the relevance of different publics (Table 2).

- 43.6% of B2B companies considered consumers to be very or extremely relevant, with 47.8% expressing this view of local residents and 37.1% considering NGOs in this way.

- 61.4% of B2C companies considered consumers to be very or extremely relevant, 42.3% expressed this view of local residents and 47.4% assessed NGOs in this way.

- Set against this, the results also show that at least 25% of both B2B and B2C companies saw all three publics as of at best limited relevance.

- The only significant difference in their rating of relevant publics between B2B and B2C companies lay in the relevance of consumers - B2C companies rated them as more relevant than B2B companies.

- Generally the larger the company the more relevant all three publics were seen to be (Graph 1). Companies with sales above £100m turnover p.a. rated all the publics as being significantly more relevant than did the smallest companies.

How influential are publics?

Given that many companies recognise the relevance of different "publics", we examined how influential these publics are seen to be. We addressed this in the survey in relation to their influence around product development, business strategy and reputation.

- We found some agreement that consumers and NGOs have influence in all three areas (Graph 2). There is considerably more variation in relation to local residents; they are perceived to wield the most influence in relation to reputation and the least in relation to product development.

- As company size increases, so does the influence accorded to the public (with one exception) (Table 5).

- B2C companies rated consumers as being more influential around product development, business strategy and reputation than did B2B companies.

- Each of the publics is seen to be most influential in relation to reputation. This is suggestive of the likely importance of instrumental motivations for stimulating communication or engagement practices.

Contact with publics

Although there are few significant differences between the different size companies in terms of public contact there are two key findings (Graph 3).

- The amounts of contact that companies perceive themselves to have with publics is generally low. It is noteworthy that the public with whom companies of all sizes have the most contact - local residents - is the public generally considered to have limited influence except over company reputation.
- There is a clear relationship between company size and reported contact: larger companies are more likely to report having contact with each of the three publics.

Attitudes to the public

One section of the survey consisted of 28 attitude items that were developed on the basis of the qualitative work and designed to assess the esteem in which the public was held, their areas of influence and possible barriers to engagement. Participants were asked to indicate their agreement with each item on a scale of 1 to 5.

A factor analysis was carried out in order understand the pattern of responses that underlay responses to this large set of variables (Annex 4). We identified three factors as 'Willingness to Engage'; 'Qualities of the Public'; and 'Public/Product Relationship'. High scores on each factor indicated greater willingness to engage with the public, more positive views of the public and more positive views of the public product relationship.

Significant findings are:

- The smallest companies are significantly less willing to engage than those companies with sales of over £20 million (Graph 4).
- Those who say their most important public are local residents are more willing to engage than those giving this significance to consumers or NGOs (Graph 5).
- Companies that have had relatively high contact with publics are more willing to engage and more positive about the public product relationship. Interestingly however, such companies are significantly *less* positive about the qualities of the public (Graph 6).
- Perceiving the public to be more influential accompanies greater willingness to engage and more positive attitudes about the public product relationship.
- Environmental Health and Safety staff express significantly more willingness to engage than Senior Managers, Scientists, Commerce and Sales and Corporate Affairs (Graph 7).

4.3 Key findings & conclusions

Our findings are complex, multi-layered, and (in common with other mixed-methods studies) sometimes seem contradictory. For clarity some of our key observations are presented in relation to our original objectives.

i) To identify how public environmental knowledge is conceptualised and used within industry

- Although acknowledging a potentially powerful 'general public', respondents viewed 'consumers' and neighbours' as their most relevant publics.
- Publics were regarded as largely ignorant about industry practices and the science behind products.
- Consumers and neighbours were regarded not as groups with knowledge meriting engagement but as having concerns which should be allayed.

ii)To identify what motivations and barriers exist for companies to make better use of lay environmental knowledge as part of their corporate social responsibility

- Our survey shows that larger companies present themselves as more positive than smaller companies about the public; viewing them as more influential and being more willing to engage with them.
- Conceptualising the public as ignorant is, in some cases, a motivation to have contact with them, and in others a reason not to engage.
- Interviewees recognised that public engagement might make good business sense but identified barriers of: expense; time required; expectations raised; lack of public demand; the difficulty of assessing the legitimacy of participants and unfamiliarity with the role.
- Companies are likely to take public concerns seriously if: the volume of complaints is large*;* official bodies or influential individuals are involved; the issue receives media attention or affects the company's market.
- The public was recognised as potentially having most effect on company reputation. This suggests that instrumental motivations are the most likely to propel industry towards engagement.

iii) To evaluate the relationship between organisational functions and use of lay environmental knowledge

- Our survey showed that Environmental Health and Safety staff express significantly more willingness to engage than those in other functions.

iv) To develop recommendations as to how lay environmental knowledge can be incorporated more effectively within industry

Our empirical findings do not lend themselves to the development of a formal 'guidebook' for industry (and the RSA have recently developed such guidance: (http://www.techforum.org.uk/guidance/), but have broader implications for practice.

- If companies do not acknowledge 'public environmental knowledge' exhortations for them to engage with it are likely to be problematic.

- Large, profitable, companies may have the resources and motivation to invest in public engagement initiatives, but small companies usually do not. Encouraging public engagement requires consideration of company resources and likely motivations.

- Calls for greater industry engagement assume that there is a public who are eager to be engaged, but interviewees saw little evidence of this.

- Our survey suggested that reported patterns of contact did not accord with the relevance and influence that were attributed to the public. This discrepancy raises questions over where best to aim attempts to increase public-industry engagement. Changing conceptions of publics will not necessarily lead to changing practices.

- Companies have channels for engagement with consumers about products and with neighbours about local issues. Rather than recommending the introduction of new processes and practices engagement might better be encouraged by thinking about how these points of contact might be used to facilitate engagement with the public as 'citizens' around broader issues.

- Companies are most willing to engage with local people. This may provide the most productive access point for engagement initiatives.

v) To develop recommendations for Non Government Organisations and members of the public on how they might improve the efficacy of their interaction with the corporate world.

- Industry does not naturally recognise 'the public'. If publics are keen to engage with industry, they need to make themselves visible.

- If industry need to understand the public and appreciate public knowledge there is a corresponding onus on 'the public' and NGOs to understand the priorities, constraints and realities within which industry operates.

- We found that public knowledge is taken seriously, possibly necessitating action when: many people say the same thing; it comes via NGOs or other powerful stakeholders; it gains media attention.

5. Activities

5.1 Feedback to Companies

We provided non-technical reports of our qualitative findings to each case study company, and survey findings to all survey respondents.

5.2 User Workshops and dissemination

- We worked with the Project Director of the RSA 'Forum on Technology Citizens and the Market' (see http://www.techforum.org.uk/index.htm) to share findings and plan dissemination. In April 2005, the RSA held a meeting 'Science based Business and Social Research' for science-based businesses, in collaboration with the ESRC's Science in Society programme. We invited all our project participants to attend. The seminar attracted people from a broad range of businesses as well as those with academic and policy interests (Annex 8). We presented our research and it was responded to by a business panel.

- The British Association for the Advancement of Science (the BA) and the ESRC Science in Society Programme have developed a seminar series that brings together practitioners and academics committed to improving public engagement (Annex 5). At a seminar in November 2006. Kate Burningham will discuss our project and Gill Samuels (Chair of the Biosciences Futures Forum) will highlight practical applications of the research and its implications for industry.

5.3 Conference papers, presentations and participation

- We have presented findings from this project at three International conferences.
- We have participated in ESRC seminar series on Environmental Citizenship, Knowledge and Power and Scientific Connoisseurship

Details in Annex 6.

5.4 Other planned dissemination

We are currently in discussion with contacts at the Chemical Industries Association, Forum for the Future and the National Consumers' Council to see how best to share ideas and insights from our research.

6. Outputs

6.1 Publications

We are currently completing three papers which we will submit to journals by the end of 2005:

- Burningham K., Barnett, J, Carr, A, Wehrmeyer, W. 'Chemical Industry's constructions of and communications with publics' to be submitted to *Public Understanding of Science*
- Barnett, J., Carr, A., and Burningham, K. "The relevance of public engagement Initiatives for Science based Industry" to be submitted to *Business Strategy and the Environment*
- Wehrmeyer, W., Barnett, J. Burningham, K. & Carr A. "Who is the public, and how does engagement happen in the chemical industry? Implications for CSR", to be submitted to *Journal of Corporate Social Responsibility*

6.2 Data sets

We have submitted our survey data to the ESRC data archive. With their agreement, the qualitative data have not been submitted (see 'Ethics' below).

7. Impacts

Two workshops have been set up by high profile external organisations (RSA, BA) specifically to share our findings with a wide user audience.

8. Future Research Priorities

- Continuing to develop practical implications of our findings for public/industry engagement.

- Exploration of the relationships between science, business strategy, participation and CSR.

- Investigation of the applicability of our findings in other industrial sectors.

9. Ethics

Maintaining company confidentiality was crucial because it is particularly difficult for social researchers to gain access to private companies and we wanted to be careful not to betray our respondents' trust in any way that might damage the field for future researchers. This meant not providing details such as products manufactured by our case study companies or company history and ethos. This was frustrating as such information helps to explain how a company thinks about the public and relates to them.

After discussion with Susan Cadogan at the data archive it was agreed that our qualitative data should not be submitted for archiving due to the difficulty of protecting company anonymity. In order to preserve the anonymity of our companies we would have had to remove so much detail from the transcripts that the data would be unlikely to be useful for future researchers.

List of Annexes

Annex 1

Survey Questionnaire

All of the questions simply require a few words or for you to choose one option from a list. May I start please by getting some background information?

1 What is your job title? (*open-ended*)

2 What is your company's core business? (*open-ended*)

3 Is your company primarily a business-to-business company (1), or a business-to-consumer company (2) Both (3), Can't choose (9) *Don't prompt these*.

Now I'd like to ask some questions on the public, especially how relevant the public is to *[insert company name]* because some people think that it is important for companies to communicate with the public, while others think that this is unimportant.

4 One way of thinking about the public is as household consumers at the end of the supply chain. How relevant are these consumers to your company? Are they:

Of no relevance (1)	of limited relevance (2)	somewhat relevant (3)	very relevant (4)	extremely relevant (5)	*Don't prompt* Can't choose (9)

5 How strongly do you think consumers associate your company with the products you produce?

Not at all (1)	weakly (2)	moderately (3)	strongly (4)	very strongly (5)	Can't choose (9)

6 How much contact would you say your company has with consumers?

No contact at all (1)	very little contact (2)	some contact (3)	quite a lot of contact (4)	a great deal of contact (5)	*Don't prompt* Can't choose (9)

7 Does your company provide information to consumers?
Yes (1) No (2) Can't choose (9)

If they do not provide information, skip to question 10.

8 How much information would you say your company provides to consumers?

Very little information (1)	some information (2)	quite a lot of information (3)	a great deal of information (4)	Can't choose (9)

9 What are the two main ways in which your company provides information to consumers? *NB this question is open-ended, un-prompted, responses may include things like:*

Annual reports Print media/ media releases Newsletters Web-site
Face-to-face meetings Public meetings Phone calls TV & radio

9a Method 1: 9b Method 2:

10 Does your company find out what consumers think about your company or its products?

Yes (1) No (2) Can't choose (9)

If they do not find out what consumers think about the company/its products, skip to question 13.

11 How much information would you say your company finds out from consumers?

Very little information (1)	some information (2)	quite a lot of information (3)	a great deal of information (4)	Can't choose (9)

12 What are the two main ways in which your company finds out what consumers think about the company or its products? *NB this question is open-ended, un-prompted, responses may include things like:*

Focus groups/ Surveys Media scans Anecdotes / word of mouth Public meetings / open days Through Trade Associations Face-to-face meetings Phone calls Through consultancy/marketing firms

12a Method 1:
12b Method 2:

Now I will read you a series of statements about consumers as those people at the end of the supply chain. You can disagree strongly (1), disagree (2), neither agree nor disagree (3), agree (4) or agree strongly (5) with each of these statements.

13 Consumers are important because they may have an influence on our product development

Disagree strongly (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Agree strongly (5)	Can't choose (9)

14 Consumers are important because they may have an influence on our business strategy

Disagree strongly	Disagree	Neither agree nor disagree	Agree	Agree strongly	Can't choose

(1)	(2)	(3)	(4)	(5)	(9)

15 Consumers are important because they have the ability to affect our reputation

Disagree strongly (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Agree strongly (5)	Can't choose (9)

A second way of thinking about the public is as the people who live near your company's factories.

16 How relevant are these factory neighbours to your company? Are they:

Of no relevance (1)	of limited relevance (2)	somewhat relevant (3)	very relevant (4)	extremely relevant (5)	Can't choose (9)	**No Neighbours** (99)

17 How strongly do you think factory neighbours associate your company with the products you produce?

Not at all (1)	weakly (2)	moderately (3)	strongly (4)	very strongly (5)	Can't choose (9)	**No Neighbours** (99)

18 How much contact would you say your company has with factory neighbours?

No contact (1)	very little contact (2)	some contact (3)	quite a lot of contact (4)	a great deal of contact (5)	Can't choose (9)	**No Neighbours** (99)

19 Does your company provide information to factory neighbours?

Yes (1) No (2) Can't choose (9) No Neighbours (99)

If they do not provide information, skip to question 22.

20 How much information would you say your company provides to factory neighbours?

Very little information (1)	some information (2)	quite a lot of information (3)	a great deal of information (4)	Can't choose (9)	**No Neighbours** (99)

21 What are the two main ways in which your company provides information to factory neighbours? *NB this question is open-ended, un-prompted, responses may include things like:*
Annual reports Print media/ media releases Newsletters Web-site
Face-to-face meetings Public meetings Phone calls TV &/or radio

21a Method 1:
21b Method 2:

22 Does your company find out what factory neighbours think about your company or its products?

Yes (1) No (2) Can't choose (9) No Neighbours (99)

If they do not find out what factory neighbours think about the company/its products, skip to question 25.

23 How much information would you say your company finds out from your factory's neighbours?

Very little information (1)	some information (2)	quite a lot of information (3)	a great deal of information (4)	Can't choose (9)	**No Neighbours** (99)

24 What are the two main ways in which your company finds out what factory neighbours think about the company or its products? *NB this question is open-ended, un-prompted, responses may include things like:*

Focus groups/ Surveys Media scans Anecdotes / word of mouth
Public meetings / open days Through Trade Associations Face-to-face meetings
Phone calls Through consultancy/marketing firms

24a Method 1:
24b Method 2:

Now I will read you a series of statements about factory neighbours as those people who live near your company's factory. You can disagree strongly (1), disagree (2), neither agree nor disagree (3), agree (4) or agree strongly (5) with each of these statements.

25 Factory neighbours are important because they may have an influence on our product development

Disagree strongly (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Agree strongly (5)	Can't choose (9)	No neighbours (99)

26 Factory neighbours are important because they may have an influence on our business strategy

Disagree strongly (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Agree strongly (5)	Can't choose (9)	No neighbours (99)

27 Factory neighbours are important because they have the ability to affect our reputation

Disagree strongly (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Agree strongly (5)	Can't choose (9)	No neighbours (99)

Another way of thinking about the public is as NGOs or lobby groups.

28 How relevant are environmental NGOs to your company? Are they:

Of no relevance (1)	of limited relevance (2)	somewhat relevant (3)	very relevant (4)	extremely relevant (5)	Can't choose (9)

29 How strongly do you think environmental NGOs associate your company with the products you produce?

Not at all (1)	weakly (2)	moderately (3)	strongly (4)	very strongly (5)	Can't choose (9)

30 How much contact would you say your company has with environmental NGOs?

No contact at all (1)	very little contact (2)	some contact (3)	quite a lot of contact (4)	a great deal of contact (5)	Can't choose (9)

31 Does your company provide information to environmental NGOs?
Yes (1) No (2) Can't choose (9)

If they do not provide information, skip to question 34.

32 How much information would you say your company provides to environmental NGOs?

Very little information (1)	some information (2)	quite a lot of information (3)	a great deal of information (4)	Can't choose (9)

33 What are the two main ways in which your company provides information to environmental NGOs? *NB this question is open-ended, un-prompted, responses may include things like:*

Annual reports Print media/ media releases Newsletters Web-site
Face-to-face meetings Public meetings Phone calls TV &/or radio

33a Method 1:
33b Method 2:

34 Does your company find out what environmental NGOs think about your company or its products?
Yes (1) No (2) Can't choose (9)

If they do not find out what environmental NGOs think about the company/its products, skip to question 37.

35 How much information would you say your company finds out from environmental NGOs?

Very little information (1)	some information (2)	quite a lot of information (3)	a great deal of information (4)	Can't choose (9)

36 What are the two main ways in which your company finds out what environmental NGOs think about the company or its products? *NB this question is open-ended, un-prompted, responses may include things like:*

Focus groups/ Surveys Media scans Anecdotes / word of mouth
Public meetings / open days Through Trade Associations Face-to-face meetings
Phone calls Through consultancy/marketing firms

36a Method 1:
36b Method 2:

Now I will read you a series of statements about environmental NGOs. You can disagree strongly (1), disagree (2), neither agree nor disagree (3), agree (4) or agree strongly (5) with each of these statements.

37 Environmental NGOs are important because they may have an influence on our product development

Disagree strongly (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Agree strongly (5)	Can't choose (9)

38 Environmental NGOs are important because they may have an influence on our business strategy

Disagree strongly (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Agree strongly (5)	Can't choose (9)

39 Environmental NGOs are important because they have the ability to affect our reputation

Disagree strongly (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Agree strongly (5)	Can't choose (9)

40 Of the three sets of publics we have been talking about, consumers, factory neighbours and environmental NGOs, which is the least relevant to your company?
1 consumers
2 factory neighbours
3 Environmental NGOs

41 And which is the most relevant to your company?
1 consumers
3 factory neighbours
3 Environmental NGOs

Right, in this last section I'm going to read out a series of statements to find out your opinions about ***repeat their choice of publics*** as the most relevant public to your company. Please don't think too much about each statement, just give your first response.

You can disagree strongly (1), disagree (2), neither agree nor disagree (3), agree (4) or agree strongly (5) with each of these statements.

42 The public contact chemical companies mainly to complain

43 Public opinion has the potential to benefit our company's product development activities

44 It is too time-consuming to engage with individual members of the public

45 Our company is open to discussing our environmental performance with the public

46 The public contacts us mainly about our products

47 It is important for the public to be able to voice their concerns about the environment to chemical companies

48 It is not our company's job to engage with members of the public

49 We don't anticipate the need to change the way our company provides information to the public

50 The public do not know much about environmental issues

51 Our company has gained from communicating with the public

52 There is no need for our company to engage with the public as their concerns are adequately addressed by government regulations

53 It would be useful for this company to learn new ways of finding out about public environmental concerns

54 The public are only concerned about environmental issues when something affects them directly

55 Input from the public can help shape corporate policy or practice

56 Communicating with the public should be a job for the trade associations rather than individual companies

57 Our company anticipates an increasing need for dialogue with the public

58 Most environmental complaints stem from NGO campaigns

59 Care lines provide companies with valuable data for strategic planning

60 It is best to avoid talking to the public about environmental issues when there is scientific uncertainty about the facts

61 The public are not scientifically literate

62 Chemical companies should engage with the public in order to offset potential liability issues

63 The public have a right to be able to influence corporate environmental strategy

64 The public are inherently suspicious about new technologies

65 Current stakeholders in the chemical industry adequately represent public views

66 The public are well informed about the chemicals industry

67 The costs of listening to the public outweigh the benefits

68 It is difficult for us to make sense of what the public want from us

69 We cannot act upon public views because they vary so much

INTERNAL COMMUNICATION SECTION

70 I regularly receive complaints or enquiries directly from the public

71 I am regularly asked to respond to public complaints or queries by my colleagues

72 We have one person or department that deals with all contact with the public

73 I regularly receive information from colleagues within the company about public environmental concerns

OK, finally.

74 Does your company have a policy on or does it practice any form of corporate social responsibility?
Yes (1) No (2) Don't know (3) Can't choose (9)

That concludes this survey

75 Would you like to receive a report of this survey? Yes (1) No (2)

If yes,

76 How shall we send it to you? Email (1) Post (2)

77 What is your current address please? *(open-ended)*

78 Lastly, do you have any comments you wish to add to this topic?

Thank you very much for your time. Goodbye

Annex 2

Survey Sample Details

The industry selected was the chemical sector, with the following distribution of companies by subsector:

The survey sample included the same type of companies sampled as qualitative case studies. Assessment of SIC codes to in/exclude was made by one member of the research team with very detailed knowledge of the chemical industry. The quantitative survey therefore focused on these sub-sectors:

US 1987 SIC codes: 2812 or 2816 or 2819 or 2823 or 2824 or 2833 or 2834 or 2836 or 2841 or 2842 or 2843 or 2844 or 2851 or 2861 or 2865 or 2869 or 2891 or 2899

Section	Name	No employees
DG SubSection	Manufac. of chemicals, chemical products and man made fibres	3817
DG.24	Manufacture of chemicals, and chemical products	
DG.24.10	Manufacture of basic chemicals	1206
DG.24.12	Manufacture of dyes and pigments	91
DG.24.13	Manufacture of other inorganic basic chemicals	207
DG.24.14	Manufacture of other organic basic chemicals	155
DG.24.30	Manufacture of paints, varnishes & similar coatings, printing ink & mastics	555
DG.24.40	Manufacture of pharmaceuticals, medicinal chemicals and botanical products	477
DG.24.41	Manufacture of basic pharmaceutical products	115
DG.24.42	Manufacture of pharmaceutical preparations	362
DG.24.50	Manuf. of soap, detergents & perfumes; toilet, cleaning & polishing preparations	678
DG.24.51	Manufacture of soap and detergents, cleaning and polishing preparations	358
DG.24.52	Manufacture of perfumes and toilet preparations	320
DG.24.62	Manufacture of glues and gelatines	89
DG.24.63	Manufacture of essential oils	56

SIC codes excluded from the sample were manufacturers of chemicals or chemical products with whom the public has little or no contact with other than in a very specialized capacity. For example, excluded SIC sub-codes of DG.24 contained manufactures of fertilizers, pesticides and other agro-chemical products

The sample was further refined by specifications about company size (not less than 10 employees) and geographic location (UK based).

A data-base of companies in the relevant SIC codes was acquired from an independent market research/list management company. The data-base represents a saturated sample of 971 UK companies in the chemical sector identified by SIC codes 2812-2899 in the broad category labeled ‘manufacturers of chemicals, chemical products and man-made fibres’ excluding those with less than 10 employees.

The data-base provided information on company contact details (company name, company number, telephone number, fax number, address and up to 8 named individual employees); SIC code and SIC code description, total number of employees, total number of local employees (UK-based), sales in £, profit in £, net worth and year of incorporation.

Annex 3

Tables

Table 1 Sales distribution of sample

Categorised Sales	Frequency	Percent
<£ 5m	137	52.3
£5m-£20m	61	23.3
£20m-£100m	35	13.4
£100m+	27	10.3
Total	260	99.2
Missing	2	.8
Total	262	100.0

Table 2 Relevance of publics by business type

		No Relevance	Limited Relevance	Somewhat relevant	Very Relevant	Extremely Relevant
B2B	How relevant are Consumers to Company?	21.6%	21.1%	13.7%	15.7%	27.9%
	How relevant are Loc Residents to Company?	14.2%	18.2%	19.9%	25.6%	22.2%
	How relevant are NGOs to Company?	13.7%	20.5%	29.8%	25.9%	10.2%
B2C or both	How relevant are Consumers to Company?	10.5%	15.8%	12.3%	15.8%	45.6%
	How relevant are Loc Residents to Company?	19.2%	11.5%	26.9%	13.5%	28.8%
	How relevant are NGOs to Company?	12.3%	19.3%	21.1%	26.3%	21.1%

Table 3 Mean Influence of Publics by Sales

Size/Sales		Consumers: influence Prod Dev	Consumers influence Bus Strat	Consumers influence Reputation	Local Residents influence Prod Dev	Local Residents influence Bus Strat	Local Residents influence Reputation	NGOs influence Prod Dev	NGOs influence Bus Strat	NGOs influence Reputation
<£ 5m	Mean	3.51 [a]	3.28 [a, b]	3.51 [a, b]	2.41	2.68	3.23 [a, b]	3.18	3.17	3.33 [a, b,c]
	N	136	134	136	111	111	111	137	136	135
	Std. Deviation	1.294	1.193	1.277	1.179	1.175	1.312	1.183	1.177	1.178
£5m-£20m	Mean	3.59	3.32	3.67	2.35	2.92	3.61 [c]	3.34	3.49	3.93 [a]
	N	61	60	61	54	53	54	61	59	61
	Std. Deviation	1.371	1.142	1.076	1.012	1.207	1.123	1.109	1.023	.910
£20m-£100m	Mean	3.97	3.94 [a]	4.00 [a]	2.48	3.22	4.03 [a]	3.54	3.51	4.09 [b]
	N	35	35	35	33	32	33	35	35	35
	Std. Deviation	1.200	1.235	1.163	1.176	1.289	1.212	1.094	.981	1.011
£100m+	Mean	4.41 [a]	4.19 [b]	4.44 [b]	3.00	3.40	4.65 [b, c]	3.52	3.67	4.44 [c]
	N	27	27	27	26	25	26	27	27	27
	Std. Deviation	.888	1.039	.847	1.200	1.291	.562	1.051	.920	.577

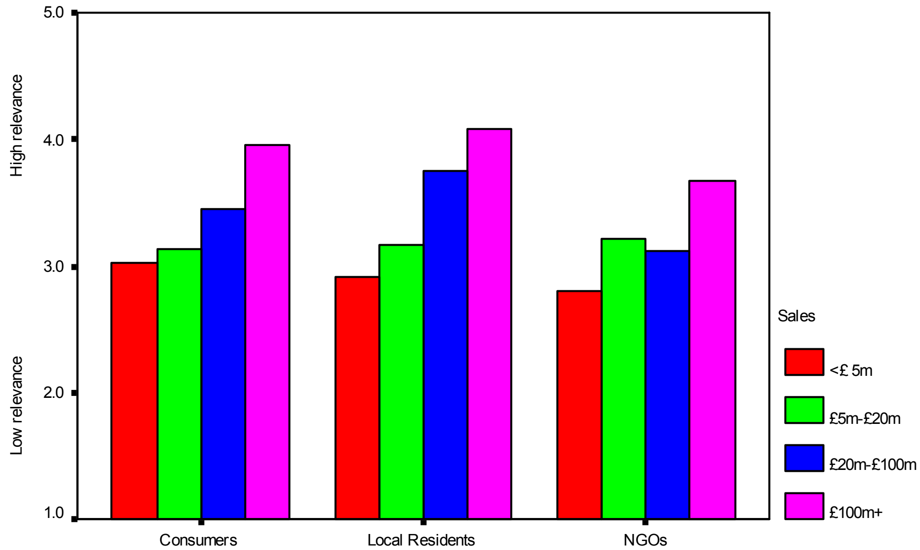
Means with the same superscript are significantly different from each other

Graph 1

Relevance of publics

Consumers, Local Residents & NGOs

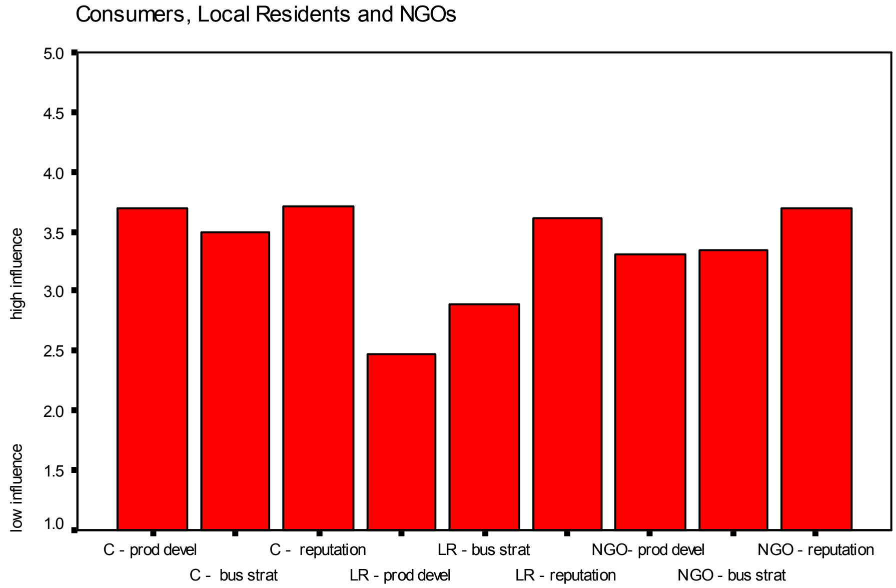
by Size of Company



Graph 2

Perceived influence of publics

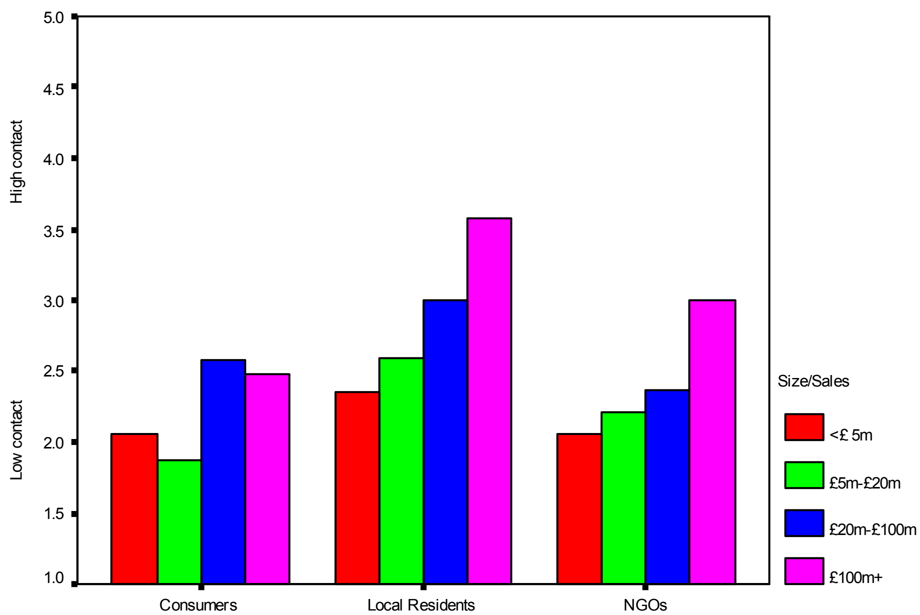
Product development, business strategy and reputation



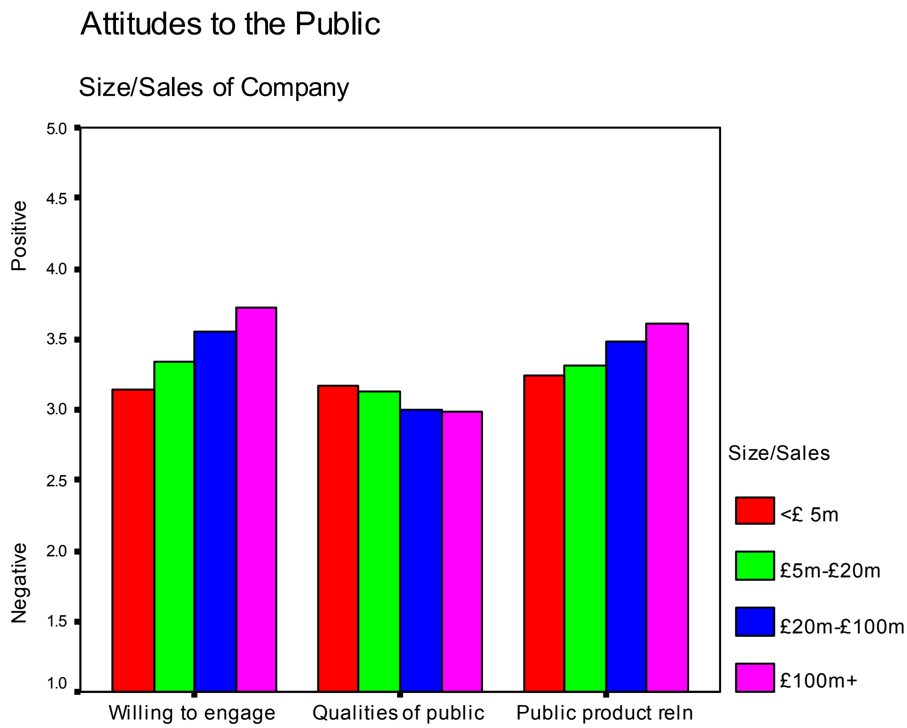
Graph 3

Contact with Publics

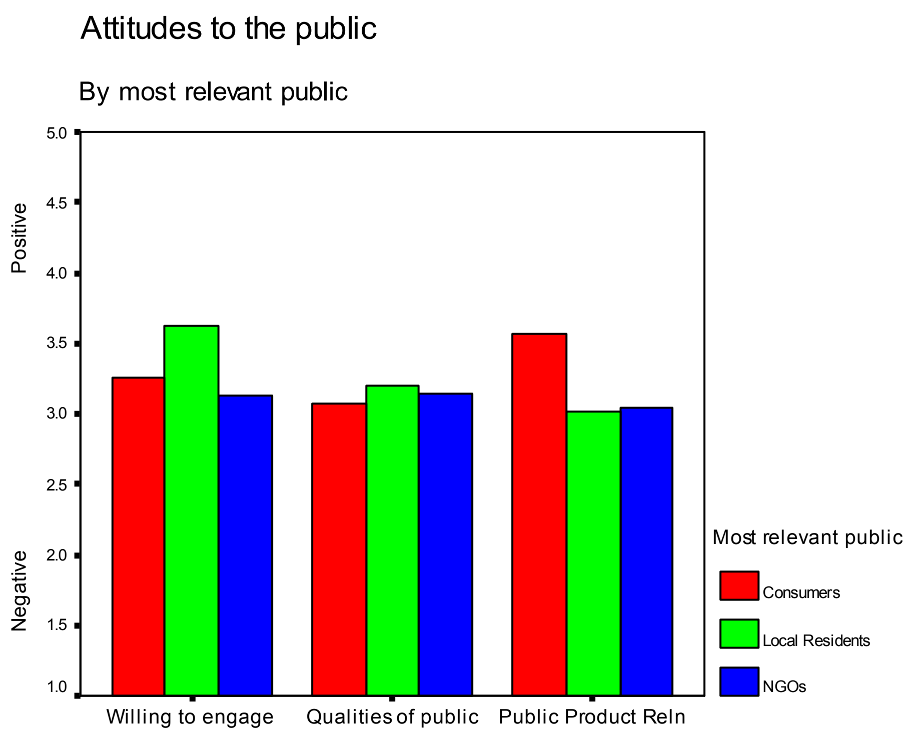
Consumers, Local Residents & NGOs



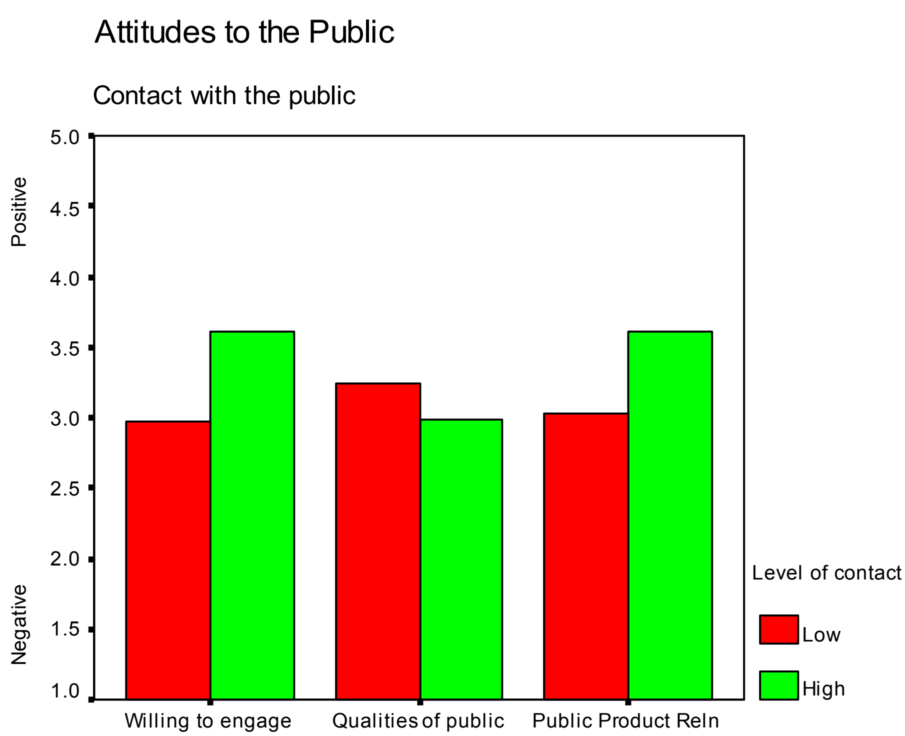
Graph 4



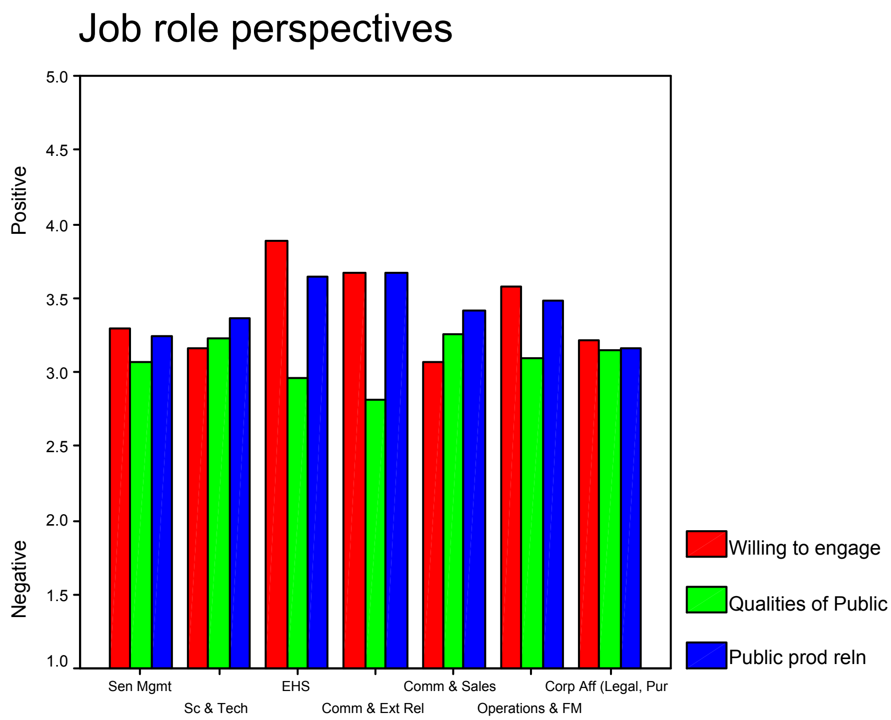
Graph 5


Attitudes to the public
By most relevant public
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
Positive
Negative
Willing to engage
Qualities of public
Public Product Reln
Most relevant public
Consumers
Local Residents
NGOs

Graph 6


Attitudes to the Public
Contact with the public
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
Positive
Negative
Willing to engage
Qualities of public
Public Product Reln
Level of contact
Low
High

Graph 7 Attitudes to the Public by Job Title



Annex 4

Details of Factor Analysis

Attitude scale runs from 1 strongly disagree to 5 strongly agree

FACTOR 1: WILLINGNESS TO ENGAGE
Willingness to engage with public (7 items. α. =.74)

1. q48 It is not our company's job to engage with members of the public
2. Q52 - There is no need for our company to engage with the public as their concerns are adequately addressed by government regulations
3. Q56 Communicating with the public should be a job for the trade associations rather than individual companies
4. Q45 - Our company is open to discussing our environmental performance with the public Q60 - It is best to avoid talking to the public about environmental issues when there is scientific uncertainty about the facts
5. Q58 - Most environmental complaints stem from NGO campaigns

6. q49 - We don't anticipate the need to change the way our company provides information to the public

DIRECTION: Once the items are reversed – on all but q45 (ie we are open to discuss env performance with the public) - the higher the score – the greater the willingness to engage. The variable in the data file that reflects this reasoning is *man1_new*

Factor 2: QUALITIES OF THE PUBLIC
Qualities of the public (8 items α. =.62)

1. Q50 The public are not well informed about environmental issues
2. q61 The public are not scientifically literate
3. Q68 It is difficult for us to make sense of what the public want from us
4. Q64 The public are inherently suspicious about new technologies
5. Q42 The public contact chemical companies mainly to complain
6. Q69 We cannot act upon public views because they vary so much
7. Q54 The public are only concerned about environmental issues when something affects them directly
8. Q67 The costs of listening to the public outweigh the benefits

DIRECTION: All the items run in the same direction and so when there is strong agreement there is a high score and this is more positive about the qualities of the public.
The variable in the data file that reflects this reasoning is *man2_new*

Factor 3: PUBLIC PRODUCT RELATIONSHIP
Public product relationship (4 items α. =.61)

1. Q43 Public opinion has the potential to benefit our company's product development activities
2. Q59 Care lines provide companies with valuable data for strategic planning
3. Q46 The public contacts us mainly about our products
4. Q55 Input from the public can help shape corporate policy or practice

DIRECTION: All the items run in the same direction and so when there is strong agreement there is a high score and this is more positive about the qualities of the public
The variable in the data file that reflects this reasoning is *F3_manual*

Annex 5

BA and ESRC Science in Society Seminars 2005

Public engagement needs to have an essential foundation stone on which work can be built. For this foundation stone to be developed there needs to be greater interaction between the science community, science communicators and social scientists.

The ESRC Science in Society programme explores the rapidly changing relations between science and wider society, while the BA seeks to help develop a national strategy for science communication. The two organisations have joined together to develop a seminar series that brings together practitioners and academics committed to improving public engagement to disseminate social science research and build relationships between science communicators and social scientists.

Each seminar will focus on one of the ESRC Science in Society research projects. The lead researcher will present their research results and at a practitioner of science communication will comment on how this research could help shape their science communication strategies explore its impact on the field.

The series is aimed at people engaged in science communication, including policy makers, professionals, academics and students from a broad range of organisations including government departments, science centres and museums, research institutions, universities, industry, NGOs, education, funding organisations, learned societies and PR.

The first three seminars in this series will be held in November at the Dana Centre in London. Places are free but must be prebooked. For further information visit www.the–ba.net/scicomm or email events@the-ba.net

Thursday 3 November 18:30 – 20:00
How do we communicate uncertainty and risk?
How can we make sure our events and programmes take account of the diverse ways in which ‘publics' construct notions of risk? Can we make discussions on scientific risk relevant to and more meaningful for everyday lives? The emerging view from social science research is that new models of science governance are required, involving innovative social and institutional solutions which reach far beyond attempts to promote better communications about the science of hazards and risk assessment. Should we be developing a new approach to risk science and governance?

Professor Nick Pidgeon and Dr Tee Rogers Hayden, Centre for Environmental Risk, University of East Anglia and researchers on the ESRC funded ‘Public perceptions of risk, science and governance’ will discuss the implications of their research with XXX

Thursday 10 November 18:30 – 20:00
Spinning science: Nanotechnology and financial news
How will popular journalism shape public debates over nanotechnology? Given the crucial role of financial institutions in the current and future development of nanotechnologies what role will the financial and business media play in the debate surrounding risks and uncertainties? Are there differences between how public risk and business risk are communicated and how does the interplay between nanotech companies, financial journalists, public relations and press officers affect the debate?

Dr Mary Ebeling, University of Surrey and principal investigator from the ESRC funded ‘Spinning Science: the Nanotech Industry and Financial News’ will discuss plans for her new research project addressing these questions along with Financial Times Science Journalist Clive Cookson.

Thursday 17 November 18:30 – 20:00
How does industry access and use public knowledge?
Are their fundamental differences between how industry and the science communication community carry out dialogue with the public. How do companies conceptualise, access and take account of lay knowledges? How can science communicators embrace a wider perspective so that industry is not seen as a separate entity in the debate?

Dr Kate Burningham the principal investigator from the ESRC funded ‘Using public environmental knowledge in industry’ will discuss her research and share experiences of how those working in the chemical industry conceptualise, access and take account of lay knowledge. Kate will be joined by Gill Sammuels, Chair of the Biosciences Futures Forum who will highlight practical applications for the research and its implications for those working in industry.

Annex 6

Conference Papers, Presentations and Participation

Papers

Carr, A., Barnett, J., Burningham, K., Wehrmeyer, W. and Clift, R. (2004). 'Laying low: environmental knowledge and the public from a corporate perspective'. Paper given at the Technologies, Publics and Power conference, Akaroa, New Zealand February 1-5.

Carr, A., Barnett, J., Burningham, K., Wehrmeyer, W. and Clift, R. (2004). 'On the use of lay environmental knowledge by businesses'. Citizenship & Environment ESRC seminar, Milton Keynes, 29 & 30 April-04

Carr, A., Burningham, K., Barnett, J., Wehrmeyer, W. and Clift, R. (2005) 'Moving public engagement upstream: corporate understandings of the public' presented at 'Science for Sale? The Public Communication of Science in a Corporate World' conference 15-17 April 2005, organized by the Department of Science & Technology Studies and the Department of Communication, Cornell University, Ithaca, NY

Burningham K., Barnett, J, Carr, A, Wehrmeyer, W. (2005) 'Industry conceptualisations of Public Environmental Knowledge' 37th World Congress of the International Institute of Sociology, Stockholm, July 2005

Burningham K., Barnett, J, Carr, A, Wehrmeyer, W. (2005) 'Using Lay Environmental Knowledge in Industry' Presentation to Policy Studies Institute Environment Group 11May 2005.

Participation

ESRC *Scientific Connoisseurship* workshop, Minster Lovell Mill March 2004

Seminar 3 & 5 of ESRC Transdisciplinary Seminar Series *Knowledge and Power* Cambridge, 2003 & 2004.

Green Chemistry and the Consumer workshop, One day workshop organised by the Green Chemistry Network and Marks and Spencers PLC , London, April 2003.

Environment, Science and NGO Activism Workshop, University of Hull , June 2003.

Sustainable Fragrance Workshop. Organised by Forum for the Future & SC Johnson, Ascot October 2003.

Annex 7

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