9

Greening organisations: purchasing, consumption and innovation

Ken Green, Barbara Morton and Steve New

In this chapter we examine some previously ignored connections between processes of organisational purchasing and innovation in the context of the greening of organisations. We build an argument around the idea of consumption and we do so to problematise explicitly the issue of collective agency as it relates to organisations. In developing the argument, we ask: who is the consumer and what do consumers do? Despite the thriving field of research in organisational purchasing, it remains tempting to slip into a rather easy and prescriptive anthropomorphism when explaining what organisations do when ‘they’ buy things. Here, we use the interplay between concepts of the individual consumer and concepts of the organisational consumer as a way to explicate some key ideas about the greening of consumption. We use these ideas as a platform for considering how various inter-organisational links limit attempts to green individual organisations. We also consider what goes on inside individual organisations as they receive and respond to external market signals that are pro-environmental.

It is our contention that any attempt to reduce levels of consumption as part of a programme of global environmental improvement needs to consider two things: consumption by *organisations* and the *innovative* activities of organisations, especially their ability to develop new products and processes. Organisations, whether public or private, are major discretionary consumers. Their purchasing will, therefore, be significant with regard to the depletion of resources and impacts of production (including incident pollution and waste) carried out by the organisations from which they buy – and so on, throughout the range of inter-organisational chains and networks. There is clearly scope for intervention in greening these chains and networks through changing how and what organisations consume. This can be achieved both by changing how companies purchase and by changing the processes of organisational innovation. Such interventions are obviously limited, however, by the power individual organisations have as they are embedded in various chains and networks, but there is no doubt that there is room to green the process of organisational purchasing and much pressure

for it. It would be no exaggeration to say that there are currently many more opportunities for professional management commitment to green consumption and innovation than there are for greening end-user consumption.

In the next section below, we explore the view that the traditional image of the ‘consumer’ is inadequate, both for theorising in the social sciences and, especially, for considerations of the environmental challenge of greening organisations and the economy. For theory, attempts to interpret the world which rely on the established models of ‘consumers’ *contra* ‘industry’ and ‘organisations’ (especially corporations) are, in our view, unhelpful. Keeping to such explicit or implicit models means that efforts to ‘green’ the economy are bound to falter without the recognition of organisations, as well as individuals, as consumers. In the following section, we examine deficiencies of traditional definitions of consumption and comment on the implications of these weaknesses. In section four, we introduce the concept of a ‘supply chain’ and elaborate it by discussing the relationship between such chains, environmental impacts and product and process innovation. We conclude by tying these threads together and briefly discussing the implications for future research and for the practical side of greening organisational purchasing.

Consuming organisations

Consumption: a frail convergence?

There has been an explosion of interest in the broad phenomenon of consumption. It has resulted in an exciting convergence of disciplinary interests: economists, historians, sociologists, psychologists and even management theorists have trundled around each others’ aisles and enthusiastically swept brightly packaged conceptual goods into their intellectual shopping trolleys.¹ This coming together is a genuine example of cross-boundary intellectual work, and there is much to commend it. The convergence is possible because all can gather around the apparently unifying idealised image of the *consumer*, which appears meaningful and comprehensible to all of the disciplines. But is this image adequate? We think not.

Firstly, in terms of the scale of economic activity, personal traditional (end) consumption is dwarfed by the spending of public and private organisations. Sales between organisations – in which one organisation will ‘sell’ and the other will ‘buy’ (and then ‘consume’ in some way) – are of major importance in any economy. Unfortunately, the definitional problems we outline below do not allow an easy estimate of the ratio of inter-organisational sales to end-consumer sales from conventional economic statistics; furthermore, the ratio will vary over time with the degree of vertical integration in the economy. Nevertheless, it is easy to see how for a given item the *sum* of its intermediate prices as it progresses down the supply chain will exceed the final price charged to the final consumer. Yet, in most writings on consumption, typically the consumer is seen as an *individual*, passively making choices between brands; this is often contrasted with a concept of ‘production’ or ‘industry’,

which conjures up pictures of smoking factories or lumbering agricultural machinery. The simplistic and dualistic imagery of these traditional models does not stand scrutiny, and limits and confuses the debate.

Some definitional problems

In recent years the discipline of Economics has come to be blamed for skewering intellectual progress by its reliance on simplistic and mathematically biased assumptions, and its abandonment of reality and empirical challenge with a flight to theoretical elegance (see, for example, Lawson, 1997). Consumption is one area that has been particularly fraught with contention and controversy, and this is perhaps to do with the fundamental difficulty of defining the term. Boulding (1948) is in no doubt that 'The process of consumption ... is the *final* act in the economic drama' (p. 614, emphasis added) or that the consumer is 'the supreme mover of the economic order ... for whom all goods are made and toward whom all economic activity is directed' (p. 613). Rather less grandly, Gregory (1987) characterises this view of consumption as 'the dead end of a one-way avenue'.

Problems arise, however, when the precise meaning of the term is required. Boulding (1948) (selected here as an influential and typical example) collapses into a tautological loop: consumers are people who consume ... and consumption is ... what consumers do. To overcome this, a series of ill defined and effectively *ad hoc* qualifications are offered, such as the 'ultimate consumer' defined as 'organisms which buy not in order to sell again, but in order to consume and enjoy; families and orphanages fall into this class' (p. 17). One page later this is expanded to 'Every individual who has to spend money in the purchase of commodities for consumption is an ultimate consumer' (p. 18). This identification of an economic process with an economic actor causes significant definitional problems; 'producers' who consume raw materials in order to make products are deemed then to have their production netted off, to give a value of 'net production'; households who also produce stop being a 'consumer proper' and may need to be considered quasi-enterprises, or have their activities divided according to some convention, a situation which is 'far from satisfactory' (p. 291) and to which 'a satisfactory definition has not been found' (p. 742).

More recent texts are often less candid about the conceptual difficulties which lie behind the elegant curves of standard theories. Sloman (1994, p. 1) defines consumption as 'the act of using goods and services to satisfy wants' which 'will normally involve purchasing the goods and services', but fails to give a clear explanation of the consumer. This is not untypical: in a straw poll of seven dictionaries of economics, six (Eatwell *et al.*, 1987; Knopf, 1991; Bannock *et al.*, 1992; Rutherford, 1992; Livesey, 1993; Greenwald, 1994) omit an entry for 'consumer'; Pearce (1992) is an exception, offering 'any economic agent responsible for the act of consuming final goods and services. Typically the consumer is thought of as an individual, but in practice will

consist of institutes, individuals and groups of individuals.’ However, the rest of his description concerns households only.

This is a tricky but significant problem, as theories of consumption play a major role in several branches of economics. Hollander (1986) points out that the development of the subject as a mathematically oriented discipline was crucially affected by the development of the theory of consumption, and this rests on the need for differentiating economic actors into categories of shared behaviour. It is clear that economics has not always considered the obvious lack of homogeneity of motivations and behaviours. Nor has it been concerned that the aggregate analysis presents a picture that corresponds to any particular reality: the detail of what a firm actually does is, in an important way, not the point. Machlup has commented, ‘to confuse the firm as a theoretical construct with the firm as an empirical concept, that is, to confuse a heuristic fiction with a real organisation like General Motors or Atlantic & Pacific is to commit the “fallacy of misplaced concreteness” (1967, cited in Sawyer, 1993, p. 22).

This would not be an issue were it not for the fact that, in many ways, economics has preconditioned the terms of discourse about consumption: sociologists and economics can share some of the same terms (notably, perhaps, the term ‘consumer sovereignty’) and mean quite different things. Debates about consumption have tended to accept the connection that when we talk about consumption we talk about the *behaviour of individuals* as consumers, when many of the interesting issues which emerge from research and reflection in fact apply just as interestingly at the *organisational* level.

It is true that the restricted notion of consumption that we have rehearsed is less common in accounts of environmental consumption.² Thus Paul Stern, in the authoritative US National Research Council’s contribution *Environmentally Significant Consumption: Research Directions* (1997), criticises the individual and household focus on consumption and defines it more broadly: ‘Consumption consists of human and human-induced transformations of materials and energy.... This is a definition of *environmental consumption*, as distinct from, for instance, *economic consumption*’ (p. 20, emphasis in original).

He explicitly includes ‘producers and distributors’, ‘public officials’ and ‘military organisations’ in the human-induced transformations that figure in his definition. However, despite this broad definition, the rest of the NRC book makes no explicit reference to organisations as consumers, focusing instead on households and ‘global consumerism’. The essence of the argument that follows is that the purchase of products and services, by organisations, is a significant aspect of consumption in its own right.

Organisations as consumers

At a trivial level, it is obvious that organisational purchasing shares many of the same features – not to mention items of purchase – that apply to

traditionally conceived consumers. Car companies need to buy not only car components and raw materials, and lubricants and energy to run the machines, but also pens and telephone services ... and toilet rolls. A moment's reflection shows that most people spend most of their waking time in corporate or institutional environments or contexts; furthermore, the products we buy have generally followed a complex web of paths from raw materials to finished products, with the elements changing ownership many times *en route*. In the world of economic exchange, buying and selling between organisations is the dominant category.

The academic study of organisational purchasing has largely been done under the banner of 'industrial marketing': this has developed over the last forty years into a significant academic industry in its own right, and draws its intellectual origins from the explosion of interest in the study of consumer marketing which followed the Second World War. It is fair to say that early attempts to develop theory were partially hampered by attempts to produce a general theory, and rather underplayed the differences between types of purchasing. Early work was dominated by a handful of academics, and set the tone of further research by concentrating on essentially positivist models with techniques appropriated from quantitative psychology, focusing on the key influencing factors in the purchase 'decision' process. However, both consumer and industrial marketing were moving on from early models of passive purchasers responding to stimuli (see Nicosia, 1966). For organisational purchasing, it was clear that decisions were *spread* among several interacting individuals within an organisation – the so-called 'buying centre' (Webster, 1965; Webster and Wind, 1972; Sheth, 1973; Hillier, 1975). The 1969 book *Theory of Buyer Behaviour*, by Howard and Sheth, attempted to develop a universal theory to cover organisational and end-consumer purchasing, but ended up reflecting a strong emphasis on consumer products. By 1977 Sheth was able to comment on the development of academic interest in industrial marketing and (rather curiously) asserted that the quantity of research in the field was comparable to if not greater than that for consumer marketing. His analysis of work in the field at that point concentrated on the range of sub-decisions present in the purchase decision (for example, choice of supplier, choice of brand, etc.), and the way in which the process of the procurement differed according to the type of purchase. Faris (1967) had introduced the idea of distinguishing between 'new buy', 're-buy' and 'modified re-buy' situations (see also Robinson *et al.*, 1967).

During this period, progress in research in industrial marketing was marked by increasing realism about the 'rationality' of decision processes within organisations: a highly influential text was Cyert and March's *Behavioural Theory of the Firm* (1963), which sought to explore traditional perspectives of economic decision making by taking explicit account of, among other things, the presence of conflictual and satisficing behaviour by organisational actors. This more realistic approach was taken further by the emergence of a group of European academics known collectively as the Industrial Marketing

and Purchasing (IMP) group, who developed the so-called interaction model (Håkansson, 1982; Ford, 1990). This work took as its starting point the empirical observation that most commercial relationships were of some considerable longevity, a point that cast doubt on the importance attached by previous work to the atomistic 'decision'. More significant was the relationship in which transactions occurred, the atmosphere of the exchange, and the economic, social and cultural context. This work emerged at the same time as growing interest from a number of other areas in management studies (notably operations management and industrial organisation theory) which stressed the significance of the relations between buyers and sellers, and the potential advantages of trust and co-operation (e.g. Sako, 1992; Lamming, 1993; Provan and Gassenheimer, 1994; Macbeth and Ferguson, 1994).

There is, then, a considerable body of knowledge about organisational purchasing. What, though, does it tell us about the process of consumption in organisations, and how does it compare with what we know about consumer behaviour as traditionally envisaged? To consider this, we will explore similarities and differences in the purchasing process under three connected headings: roughly, these correspond to the questions *who*, *how* and *why*.

Who is the consumer?

It is tempting to postulate that a key difference between the purchasing of an organisation and the purchasing of a traditional end consumer will be the identity of the person doing the consuming: in many organisations, purchasing/procurement activities are typically carried out by central purchasing departments, whereas the atomistic end consumer acts as an individual. However, we should note that not all organisations have central purchasing departments. For example, the chemical distributor serving a city council we have studied is accredited to ISO 14001³ but is only a seven-person operation in which 'purchasing' is one of many functions undertaken by the managing director. In the city council itself, a team of only four provides purchasing services, while routine purchasing is authorised and managed by departmental heads throughout the organisation who call on purchasing expertise (from the purchasing 'department') as they require it. Even within organisations, therefore, purchasing may or may not be carried out by specialists. Indeed, in smaller organisations it may look more like 'end consumer' purchasing.

However, we need to be cautious of making too much of these differences. The idea of an end consumer buying for her/himself may be challenged as itself misleading. Miller's *A Theory of Shopping* (1998) elegantly describes how the purchasing behaviour of traditional consumers is in fact dominated by acts undertaken on behalf of others (for example, a parent shops for food on behalf of a household). If this counts as 'consumption', then surely so does a purchasing agent buying on behalf of a 'user' within an organisation? One difference that does apply, however, is the character of who does the purchasing: organisational purchasing is now the domain of specialists operating

in dedicated purchasing departments. This means that – in Western economies, at least – a considerable amount of purchasing is controlled by a body of people who have a professional commitment to a set of values, practices and norms, sometimes being members of professional associations. For example, the UK-based Chartered Institute of Purchasing and Supply, CIPS, has a membership of approximately 5,000, administers a training programme at various levels, and also sponsors and accredits courses in universities. There is a similar organisation based in the United States, the National Association of Purchasing Managers (NAPM), founded in 1915, although its roots go back almost to the turn of the century (Farrell, 1954).

Although falling short of the type of professional identity associated with, say, medical doctors or architects, the notion of consumption processes being mediated by specialists has implications both for theorising consumption and for understanding environmental impacts. The ‘consumer’ – as traditionally constructed – is inevitably portrayed as something of a dupe, subject to the wiles of the sinister advertiser and manufacturer. The very point of the purchasing professional is to break out of this stereotype: the organisation of procurement means that there is at least some hope of more balance in terms of sophistication, cunning and knowledge. Many of the rather sanguine analyses of the effectiveness of Green consumerism point to the difficulty consumers face in interpreting and digesting technical information, or being able to make informed judgements of suppliers’ claims. In organisational consumption, there are *a priori* reasons to suspect that the prospects are somewhat better. Moreover, there is the likelihood that professional purchasers are potentially swayed by norms and notions of ‘good practice’ (see, for example, Dobler *et al.*, 1990, pp. 721–41) and that organisations’ buying may be influenced by attempts to define environmental considerations as acceptable practice. Indeed, one initiative in the United Kingdom – ‘Buying into the Environment’, a CIPS/Business in the Environment collaboration – has sought to do just that (CIPS/BIE, 1993).

Another point concerns the reification of organisations as economic and sociological actors. In everyday talk it is common to refer to organisations as entities making decisions, exhibiting behaviour and even having intentionality. Legally, in most countries’ systems, corporations have some kind of legal personality for the purposes of contract and tort. Why not, then, extend the discussion of consumption to organisations directly? This raises a raft of complex theoretical challenges, such as just how questions of social justice are applied to organisations.

How is consumption accomplished?

Even if the separation of purchase from user is conceded, it might be argued that it is still easy to differentiate the realms of organisational and traditional consumer by reference to the *systematic* nature of procurement in organisations. Within an organisation, purchasing is carefully controlled by bureaucratic procedure (see Heinritz *et al.*, 1991), whilst for the traditional

consumer there is no such constraint. The consequence would be, according to this argument, that one would expect a greater degree of *rationality* in organisational purchasing. Hollander (1986) discusses J. S. Mill's separation of economic rationality between consumer and business: 'Mill observed that buyers at retail outlets do not typically make their purchases "on business principles" – a reflection of their indolence, carelessness, satisfaction derived from paying high prices, ignorance, defective judgement and coercion, apart from high search costs' (p. 136).

As organisational purchasing deals with the outflow of money from the organisation, it is not surprising that it is generally accomplished in the context of some systematic procedure. Scheuing (1989, p. 73) comments, 'The procurement process itself is a prime example of a standard procedure.'

The environmental implications of a consumption process that is so heavily structured are paradoxical. This is seen in particular in the public sector, where the proceduralisation of procurement is most evident. On the one hand, the systematic nature of the processes of public procurement is amenable to the incorporation of environmental criteria; on the other hand, the systems are there principally to ensure financial rectitude, and so sit uneasily with other criteria (see New *et al.*, 1998). Despite the paradox brought about by the structure of purchasing, however, there are several ways in which the organisational purchasing process can have an environmental impact, and these include but exceed the scope of action available to the traditionally defined consumer. In short, organisational procurement may be constrained by the degree of structure, but compensated by its broader scope.

To understand this, it is worth considering the ability of the traditional consumer to have any effect on the supply chain. Two of the roles examined in Gabriel and Lang's *The Unmanageable Consumer* (1995) are that of the *rebel* and that of the *activist*. In the former, consumers may instigate boycotts of particular suppliers; in the latter, consumers may agitate and organise to redress the imbalance of power between consumer and big, powerful firm. Organisations are able to play both these roles, but may also have options that are not available to other types of consumer. Firstly, there is the greater scope to play a significant role in the specification and design of the product and service on offer. Secondly, there may exist scope for imposing requirements on suppliers relating to process as well as to product; an example would be using the adoption of environmental management systems (such as ISO 14000) as a prerequisite of approval to supply (Cascio *et al.*, 1996; Krut and Gleckman, 1998). Thirdly, there is sometimes scope for projects which entail the direct transfer of knowledge and technology between buyers and sellers (see Lloyd *et al.*, 1994; Burnes and New, 1996; Burnes and Dale, 1998).

However, whilst the processes of procurement may be markedly different between traditional consumers and organisations, not least in the time taken, it would be wrong to infer too great a variance in the degree of *rationality* applied to the process. One result from the industrial marketing literature that is beyond dispute is that purchasing in organisations is open to all sorts of

influences from the wily salesperson. The interactions implied in the notion of supply relations bring with them even more complexity, and take purchasing decisions beyond the realm of pure idealised analysis. Davis (1994), for example, examines the wide range of reasons which are used by retail buyers when 'de-listing' products (i.e. when they stop taking a product from a particular supplier); owing to the complexity of dealing with the accounting problems, decisions ostensibly based on economic criteria are in fact often made without the information really needed to make a definitive judgement. Furthermore, research on organisational behaviour has proceeded since the days of Cyert and March to reinforce an even more cynical view of the limitations of organisational rationality; Brunsson (1989) explores the way in which conflicting discourses are endemic in organisational life, generating a degree of 'hypocrisy' in the way in which organisations conduct themselves.

Why are things consumed?

A major element in the development of theories of consumption in sociological (and marketing) terms is the establishment of the notions of consuming not for the 'real' value of the thing consumed but the 'meaning' of the act of consumption (Belk, 1988; Bock, 1993; Elliot, 1994; Hogg and Mitchell, 1996). This idea is not new, of course, and analysis of the phenomenon in terms of the current debate dates at least to Veblen (1899). What is new in the field is the refinement of models of the mechanisms of meaning, and the impact of this process on the construction of identity and society. For Baudrillard, for example, consumption and the consumer society are the *motif* of the age (see Poster, 1988); Narotzky (1997) comments that, for some writers, consumers and consumption fill a role formerly taken by class and capitalism in the understanding of social relations. For traditional consumers, the meanings of consumption can be as banal as showing off wealth to one's neighbour or as simple as purchasing a particular brand of detergent to prove to oneself that one is an adequate parent (see Flynn and Goldsmith, 1994).

In order to develop the argument at this point it is important to differentiate between two 'whys' which may apply in this context. The first is the question 'Why consume?' or 'Why consume so much?' The second is 'Why consume this particular thing rather than that?' The idea of consumption as meaning or identity generation arises as an attempt to explain both the volume and the detail of things consumed.

When discussing traditional consumers, it is difficult to engage in this aspect of the debate without sinking into a discussion of 'real' versus 'non-real' needs, a philosophical point of some complexity. For organisational purchasing, however, surely this issue should not arise. Economically, why would an organisation buy anything it does not 'need'? Reflection shows, however, that there are ample cases of corporate 'excess': Why use colour overhead slides for that internal presentation? Why have a fountain in the reception area? An entertaining portrait of lavish expenditure by organisations is found in Burrough and Helyar's (1990) ironic account of the struggle for meaning

in RJR Nabisco (which involved, for example, the purchase of private jets for senior executives and the holding of generous parties); it is true that the market eventually imposed discipline on such ostentation, but only after an extended period of consumption that was certainly directed to *symbolic meaning* rather than need, narrowly defined. Note that excess in one aspect of an organisation's activities need not mean other aspects are organised in the same way; Wikstrom (1997) points out that individual consumers may also display extremely complex patterns of behaviour (such as shopping in charity shops and drinking champagne), so that austerity and excess are entwined.

The scale of ostentation in consumption is not the only issue, however. In terms of the detail of things consumed – the choice between goods rather than the total volume consumed – the significance of particular consumption for particular meaning is also clearly visible in organisations. A mid-1998 UK advertising campaign by IBM suggested to decision makers that they should buy the company's equipment because 'When you give people better tools, you are telling them what kind of company they work for.' This is a variant on an old IBM saying, 'No one ever got sacked for buying IBM', but both are more about the feelings of the person doing the purchasing than the product itself. This point applies to services as well as products: just as an individual's consumption of the arts and education can be seen as consumption for the acquisition of 'cultural capital' (Bourdieu, 1984), an organisation's purchase of training or consultancy services can be seen in a similar light. Organisational purchasing, then, can be easily squared with two more of Gabriel and Lang's roles for consumers: the *communicator* and the *identity seeker*. In our research, two of the organisations with which we have worked provide interesting illustrations of this: one large firm wished to re-evaluate its purchasing activities in the light of environmental considerations, motivated very strongly by a concern for public relations and corporate image. Another firm – a retail buying group – saw environmental concerns as very important to its own identity as an organisation. The reason for examining the environmental credentials of products and suppliers fitted the group's culture and character: what it perceived itself to be, and what it aspired to be, was the sort of organisation that would concern itself with these issues.

The implications of these ideas are significant, but also complex. Organisations and their managers may have many reasons for considering Green issues (Gallaroti, 1995), but if the idea of 'consumption for meaning' is allowed, the problem of connecting the semiotics of greening with some underlying reality becomes significant. Serious difficulties arise for both activists and academics: the identity construction or PR manipulation process may be a driving force for organisational Green consumption but may also entail an element of 'greenwash' (Greer and Bruno, 1996). Is the correct response to encourage firms in their rhetoric, even if the objective reality of what they do falls short of their own claims? Or is blowing the whistle on corporate cant the best idea?

Greening innovation and organisational purchasing

Chains of supply

The discussion above has identified some key aspects of organisational consumption. We now turn to the context in which such activity is set, and develop a series of ideas that develop and expand upon the notion of the 'supply chain'. A supply chain is a metaphor for the linear sequence of connecting links between organisations (which in market economies will usually be firms) (see New, 1994; Harland, 1996). It maps the way in which, for example, materials and components intended for a particular product or service flow from raw material firms, through component firms, assembly firms, retail firms, transport firms, service firms and, finally, disposal and recycling firms. In this sense the supply chain is the organisational 'crystallisation' of real material flows which form the 'life cycle' of the product, from cradle to grave.⁴ Of course, a particular chain – for the production of automobiles, for example – is a complex network of organisations spread over a wide geographical and temporal space. However, the *flow of material* is unidirectional – raw material firms 'supply' other firms further along the product's life cycle, which is why we use the chain rather than the network metaphor.

Different types of products have differently structured supply chains; for example, compare *consumer durables* (assembled by large companies for many end users where product design is concerned with mechanical and electrical engineering) with *construction* (many small firms for fewer end users – property developers – where product design concerned with systems and civil engineering). The structure of the chains will be continually changing, owing to company take-overs, mergers or bankruptcies and the increase or decrease in outsourcing. The structural relationship of organisations constitutes the 'supply chains', but the detail of this structure is fluid and extraordinarily complex; organisations may from time to time adjust the level of vertical integration, and the same organisations can operate in different ways in different product sectors.

The structure of a particular supply chain is crucial in determining how environmental impacts of the various aspects of a life cycle can be reduced. Indeed, it is the decisions and strategies of the organisations in a flow that will determine what that flow is. For example, if a firm decides to accept recycled components, the structure of the flow will change because of this decision. Flows are a result of organisational relations, subject to the obvious time-related aspects of that flow (i.e. the components have to be made first – and raw materials transformed into the components – before assembly can take place), rather than of physical ones.

Therefore, a crucial component of understanding how a supply chain may change is the nature of relations between the organisations in it. This will be related – *inter alia* – to the size and power of the organisations in that flow. Which organisations are the most powerful, and therefore are the most able to make changes in the chain, depends on historical accumulations of economic

and/or political power. Of course, external events, be they government regulations, campaigning by environmental pressure groups or consumer demand, will constrain or redirect that power. In a report published by A. T. Kearney (1994) one of the present authors has hypothesised a scheme of different kinds of power in addition to the 'traditional' ones of monopoly, geographical proximity and ownership: *power by spread* (i.e. diversifying your customer base); *power by focus* (i.e. including the product in an unrivallable service package, and so increasing customer dependence); and *power by initiative*. This last one includes power by *innovation*, represented by a continual flow of innovative product and service elements to keep ahead of competitors.

Innovation

The importance of technological innovation, embodied in new products, processes and systems, to long-term environmental improvement and especially to sustainability should be obvious (Green and Miles, 1996; Porter and van den Linde, 1995a, b; Howes *et al.*, 1997). Of course, new technological developments on their own will not be able to bring about the degree of environmental improvement some consider to be necessary – changes in social organisation and in the mode of delivery of desired final household services will also be needed to bring about any 'Factor Four' – never mind 'Factor Twenty' – changes (von Weizsacker *et al.*, 1997; Vergragt and van der Wel, 1998). However, new patterns of sustainable living inevitably require new methods of production, using, for example, less energy and new methods of household delivery of services: such changes are inconceivable without the availability of products designed on new principles and, in many cases, based on new technologies. Such new products and production methods are the outcomes of the innovation activities of organisations large and small.

To understand how such product and process innovation can be better directed towards 'Green' objectives, we have to take account of the many studies of product/process design, development and innovation that have been conducted over the last twenty-five years (see Freeman and Soete, 1997; Tidd *et al.*, 1997). There is a considerable amount of empirical research (Green *et al.*, 1994; Howes *et al.*, 1997; Christie and Rolfe, 1995) showing that almost all innovative product or process developments in organisations undertaken for environmental reasons are stimulated either by *government regulations* (actual or expected) or by what is labelled as *market demand* (currently experienced or imminently expected). Government regulations can act directly as a stimulus to changes in the selection of which research, development and innovation projects an organisation will pursue (a prime example being the influence of the banning of ozone-harming CFCs on stimulating the innovation of chemical alternatives and, indeed, of completely new forms of refrigeration). The innovation-inducing regulatory 'signal' may be 'received' by an organisation via a variety of routes. Some organisations, usually the largest ones in those industrial sectors, like chemicals, that have been the subject of intense regulatory scrutiny, have R&D departments that maintain

close links with their colleagues who are continuously monitoring external regulatory changes.

Even if there are no direct regulatory constraints operating, an organisation may innovate because it *anticipates* demand from its customers for more environment-friendly products. Indeed, as we have observed from several of the examples we have studied, such organisations may have made a strategic decision to offer such products, expecting to ‘educate’ their customers into purchasing them. However, for many organisations, the key ‘channel’ for receiving such signals will be its *customers*, who may demand changes in the environmental specification of the products they buy from their suppliers. The suppliers are therefore in this case often responding to ‘second-hand’ regulation conveyed through changes in market demand exhibited between customer and supplier.

The literature on the determinants of technological innovation has explored in detail the influences of the market and other factors in inducing innovation, from the 1960s onwards. The focus of economists of technological development has tended to be on the relative importance of ‘demand pull’ and ‘discovery push’ as prime movers of innovation. (Dodgson and Rothwell, 1994). To oversimplify, the current ‘model’ is an elaboration of the view arrived at in the 1970s (resulting from much empirical investigation of how a wide range of innovations actually emerged) that innovation is a result, in varying degrees, of combinations of signals from ‘demand’ and the development of new applicable knowledge produced in firms and in public-funded research institutes. Such a model draws attention to the fact that there cannot be *one* mix of ‘demand’ and ‘scientific knowledge’ that explains the origins of all innovations. Research in the 1980s concentrated therefore on identifying the different mixes as revealed between different industrial sectors, between sizes of firms (the time-honoured debate regarding the highly innovative small firm and the monopolist large firm), between differing national contexts and, crucially, depending on the position the innovations occupy in the life cycle of a particular technological regime. (Tidd *et al.*, 1997)

Studies of the patterns of innovation have revealed the way in which different types of product and process innovation (e.g. radical versus incremental; science-intensive versus redesign) arise in different industrial sectors at different times in the developmental history of a technology. The ‘science-based’ industries (electronics, chemicals) are the source of the more fundamental innovations that are embedded-new-technology inputs (as advanced raw materials or components) to all other sectors; ‘specialist suppliers’ (machinery, instruments) are another major source of embedded technology (principally into other industries’ processes or service-enabling systems); other sectors, however, will have much less room for manoeuvre, in anything other than minor product or process innovation.

Thus some organisations in a particular supply chain will be much less able to respond to customer signals/requests on their own, because the relevant technologies are not directly within their control. For example, a packaged-food

manufacturing firm cannot easily respond to demand from retailers for package reduction but must pass such requests to the manufacturer of the packaging materials, who may in turn be limited by the raw materials available from chemical companies.

So, rather than seeing the link between ‘demand’ and innovation as a simple one between an organisation and its market, we should see it as a *series* of links, with purchaser demands requiring a cascade of similar links up the supply chain. The ability of any particular organisation in the chain to respond to those demands is dependent on its position in the chain (which is connected with the power it has) but also on its possession (or not) of innovative technological knowledge. The fine structure of the chains – especially how organisations relate to each other in terms of their strategic importance in product and process innovation – is crucial to an understanding of how ‘Green’ innovation can take place. We need to focus on how organisations relate to each other as sellers and buyers (marketers and purchasers) and how this connects with their role as product and process innovators and (possibly) carriers out of research and development (R&D).

In addition to the supply chain metaphor providing the external frame of analysis for the activities of organisations, the notion allows the consideration of what goes on *within* the organisation. This brings the discussion back to the ideas of organisational versus individual consumption discussed earlier, and in particular to a detailed consideration of the nature of organisational action and the flow of information.

Purchasing and innovation: consumption in chains

We now turn to the way in which these two preceding discussions interact. In section three we demonstrated some of the similarities and differences between organisational and individual consumption; Section four set out the notion of the supply chain and how it can affect environmentally appropriate innovation. This section shows how these issues can come together and teases out some general themes. The ideas that forge the link are the concepts of (1) *agency within organisations* and (2) the *transmission of market signals*.

We earlier examined the questions ‘Who?’ ‘Why?’ and ‘How?’ These transpire to be important points in understanding the organisations we have studied, and questions that lead to some interesting general conclusions. Various sociological and demographic typologies have been suggested to describe the individual Green consumer: ‘true-blue greens’, ‘greenback greens’, ‘premium greens’, ‘no-cost ecologists’, etc. (Schwartz and Miller, 1991; Simon, 1992; Wagner, 1997). However, we suggest that such convenient categorisation would be inappropriate for corporations and other organisations, owing to the internal structures of agency.

The first point to be made is that the places within many organisations that are able either to translate environmental concerns into procurement activity or absorb and react to concerns from upstream customers is rather ill defined. In

one organisation we have observed – a local authority in the United Kingdom – the buyers' main activity was to provide users with a catalogue of possible purchases, negotiating supply arrangements and contractual terms with suppliers, but leaving the task of selection and ordering to 'users'. As the services of the purchasing department were 'sold' to the user base, there was considerable focus on meeting the wishes of the users. This was felt by purchasing managers to be a natural constraint on the extent to which Purchasing could introduce Green products into the catalogue, and – for the purchasing department – rendered too close an eye on the environmental credentials of suppliers and the details of their processes an expensive irrelevance.

For another organisation we have observed, a major 'Green' cosmetics retailer and manufacturer, in contrast, the analysis of the Green credentials of suppliers was a major business issue, and warranted a department separate from the main purchasing department. In another retailing organisation, a committee charged with considering environmental and ethical issues struggled to develop sensible policies that could be applied among buyers steeped in a more traditional ethos of retail buying. In one health-care product manufacturer, we found an intricate web of influencing bodies and parties to the purchasing process. In a utility services company, we found a senior procurement manager taking the lead, in collaboration with environmental managers, to ensure that Green criteria were used as a component of decision making. In a public-sector organisation we found environmental specialists striving to have an impact on procurement decisions, but feeling constrained by the regulation of public procurement. In contrast, another public body felt no qualms at putting explicit pressure on suppliers to develop environmental policies and attempting to stimulate product and process innovations.

These disparate ways in which organisations approach Green purchasing lead to an interesting comparison with the idealised notion of the Green consumer. The wide range of patterns of departmental and personal involvement, and the widely varying effects (real and perceived) of purchasing procedures, make the simple ascription of an organisation as a 'Green buyer' rather unconvincing. In terms of the importance of individuals, however, we do identify at least three potential roles that may be significant in the stimulation of innovation. The first is that of the 'Green (procurement) champion', someone who for whatever reason (we discuss motivation below) has an interest in introducing Green issues into procurement in some way, and has an organisational position from which such activity can be affected. Interestingly, we found this role could be filled by senior procurement managers, environmental managers or senior general management. The second and more modest role is that of 'Green (procurement) campaigners', people who (again, for multifarious reasons) have an interest in stimulating activity in the topic within an organisation, but may lack the organisational position and status to effect real change. More surprisingly, we also found managers who fell into the category 'Green (procurement) careerists'. This label is not meant in a derogatory sense, but is appropriate to describe managers for

whom launching initiatives in environmental purchasing is connected with other personal or organisational agendas; we encountered the phenomenon in a number of forms, and it seems that whilst it may be a highly effective basis for the greening of procurement in some contexts, it is not necessarily premised on the individuals concerned having a keen personal commitment to environmental issues.

Just as the issue of agency illuminates the process of Green purchasing, the concept of the transmission of market signals is valuable for understanding what goes on when organisations pursue environmental issues. However, the exact mechanisms inside organisations by which demand signals are received, understood by marketing and (where applicable) R&D departments, and then translated into practical innovative product/process development have been relatively unexplored: we need therefore to consider how any environmental signals that are integral to what a firm buys stimulate its suppliers to innovate and how this takes place.

Oversimplifying, we can assume that persistent requests from customers for some particular product features (e.g. that the product should be more environmentally friendly in some way) will be conveyed from an organisation's sales department to its R&D department by whatever interdepartmental liaison systems are in place. The R&D department will respond by amending its portfolio of projects to redesign existing products and processes or develop new ones. Within each organisation, there are a variety of potential links between the sales department, the R&D (product/process development) department and its environmental management procedures. In addition, there are market links between its sales department and the purchasing department of its customers, and between its own purchasing department and the selling departments of its suppliers.

In this model, the only links that are certain are the market connections that link buying from suppliers and selling to customers. However, the other links are less certain; there is a huge variety of forms and combinations they can take, if they are indeed present at all (many companies do not have an R&D department or, indeed, environmental management systems).

The ability of an organisation to respond to any demands/pressures from its customers for more environmentally friendly products will depend on three things. Firstly, there is the matter of how 'attuned' the sales department is to the demands its customers make and how it makes 'sense' of them in terms of the need to re-consider the product and/or its production process. Secondly, there is the question of how effective the mechanisms are that bring sales/marketing together with R&D; this will depend on what particular organisational relationships have been established for the marketing-R&D interchange, whether about environmental issues or about other issues (price, quality, etc.). Thirdly, there is the ability of any R&D department to respond to requests to attend to environmental issues.

As we have already mentioned, the examples we have examined have shown that the environmental signals that the organisations receive often

come from *customers* or *regulators*. Even so, environmental signals from regulators are often the result of legislation affecting customers as users; only a few large proactive final consumer-oriented organisations are developing environmentally superior products as a matter of business strategy. Whilst the environmental performance of products is being improved in many companies, it takes place generally in situations where the environmental performance of the product is a key factor for the consumer. Ironically, however, as Foster (1999) has shown, the focus on 'customer requirements' is very often a *limiting* factor, restricting R&D departments from proactively developing products with improved environmental performance. Organisations which see themselves as driven by 'demand' cannot build environmental objectives into their R&D projects until they perceive them as customer requirements. However, such environmental demands may come up in supplier–customer dialogue only when it is a key performance issue rather than as a matter of course. Conventional market relations between seller and buyer do not of themselves routinely provide a clear channel for environmental signals from 'the customer' to product innovation.

There is, however, a complex relationship between signals being received passively and signals being stimulated *by the supplier*. One organisation we observed – a large, internationally active telecom equipment firm – sought to tackle 'environment' as an issue involving a range of people inside and outside it: customers, account managers, purchasers and suppliers. Players in environmentally well regulated markets are very likely already to have tackled management systems (internal solutions to their environmental problems), Life Cycle Assessment for product development and supplier environmental appraisal and assessment. Environmentalist specialists in such firms are now faced with the task of getting the 'environment' recognised as a key business issue. Environment, in their view, needs to be seen as strategically important to the business. So they introduce environment to account managers (sales and marketing) and customers at the same time; they want to have another set of connections with the customer – through environment – and want their customers to think of the firm as a reliable source of information on the environment, as well as thinking of it as a reliable, quality supplier. Firms can indeed *stimulate* signals from customers through 'dialogue' and education. For example, we have observed that health-care product companies operating in the UK market will increasingly seek to introduce 'environment' on to their (National Health Service) customers' agenda. In this case, it is reasonable to say that with environmental as with other product and process features, innovation activity is a complex mixture of 'supplier push' and 'market pull'; the caveat is that both these mechanisms need careful disaggregation, and that the detail of organisations, processes and products needs to be considered.

Conclusion

The role of the ‘consumer’ (the end consumer, you and me, who buy commodities from retailing organisations) in ‘greening’ the economy has long been recognised by environmentalists. Since the late 1980s, environmentalist activist organisations have advocated the use of consumer pressure, for example through boycotts of environmentally harmful products and through positive purchasing of ‘Green’ products, to influence what firms offer for sale and, indeed, to influence their policies towards the environment overall. End consumers’ views and preferences on environmental performance (‘consumers as stakeholders’) are increasingly part of the rhetoric of business organisations in their attempts to interpret sustainable development for their own ends.⁵

However, as we have argued in this chapter, it is our contention that the traditional image of the consumer is inadequate, both for theorising in economics and sociology and, especially, for consideration of the environmental challenge of greening industry and the economy. We have set out the arguments for treating organisations as consumers, and developed a framework for examining the differences and similarities between the two categories.

Using the concept of the supply chain, we have discussed how it frames both the external context of organisations and is also helpful in understanding the texture of behaviour within them. Focusing on the ideas of agency and the transmission of market signals, we have indicated areas that point to a much richer and more complex story than the simple accounts of Green supply might suggest. Certainly more work needs to be conducted on these topics – developing a better understanding of how organisations operate in the context of changing environmental pressures from their suppliers as well as their customers as well as conducting more empirical studies.

With regard to any ‘policy’ conclusions from our discussion, we have seen that market mechanisms for the ‘greening’ of organisations and of product innovation can be seen as just as problematic as other mechanisms, whether they be tighter regulation or changes in ‘management values’. The ‘greening of innovation’ requires attention to these internal company management and organisational issues as much as it does to the public policy issues over regulations. For both private and public sectors, we suggest that Green supply practices need to be implemented concerning organisational structure and strategy. Where this is not so, greening initiatives will flounder.

Acknowledgements

The research on which this chapter is based is supported by the Global Environmental Change Programme of the Economic and Social Research Council, project No. L320253242. We acknowledge the support of the ESRC and of a large number of firms and other organisations that have taken part in the research. Thanks also to Chris Foster and to anonymous referees of the earlier versions of this chapter. This paper was originally published in *Organization and Environment* (vol. 13, no. 2, 2000). It appears here by permission of Sage Publications Inc.

Notes

- 1 For example, in economics see Ekins (1992); in environmental studies see Redclift (1996) and Sagoff (1995); in sociology see Warde (1997) and Gabriel and Lang (1995); in cultural studies see Miller (1995, 1997); in psychology see Friedman (1994); in geography see Bell and Valentine (1997), in history see Brewer and Porter (1993) and Horowitz (1992).
- 2 See Elkington and Hailes (1998), Irvine (1989), Charter (1992), Wagner (1997), NRC (1997).
- 3 ISO 14001 is an internationally recognised environmental management standard.
- 4 Writers on industrial ecology and industrial metabolism describe flows of physical materials through industrial sectors. See Ayres and Ayres (1996) for examples of flow charts for copper, chromium, zinc, cadmium and also tyres; these charts show the flow of materials (in masses) from mining through processing to end products and, occasionally, to waste/recycling.
- 5 The World Business Council for Sustainable Development, a coalition of 120 international companies, has sponsored a number of books arguing for greater business consideration for 'sustainable consumption' and 'meeting consumers' real needs'; see Willums (1998); DeSimone and Popoff (1997).

References

- Ayres, R., and Ayres, L. (1996), *Industrial Ecology: towards closing the materials cycle*, Cheltenham, Elgar.
- Bannock, G., Baxter, R. E., and Davis, E. (1992), *The Penguin Dictionary of Economics*, Harmondsworth, Penguin.
- Belk, R. (1988), 'Possessions and the extended self', *Journal of Consumer Research*, 15, pp. 139–68.
- Bell, D., and Valentine, G. (1997), *Consuming Geographies: we are where we eat*, London, Routledge.
- Bocock, R. (1993), *Consumption*, London, Routledge.
- Boulding, K. (1948), *Economic Analysis*, revised edition, London, Hamish Hamilton.
- Bourdieu, P. (1984), *Distinction: a social critique of the judgement of taste*, Cambridge MA, Harvard University Press.
- Brewer, J., and Porter, R. (1993), *Consumption and the World of Goods*, London, Routledge.
- Brunsson, N. (1989), *The Organisation of Hypocrisy*, Chichester, Wiley.
- Burnes, B., and Dale, B., eds (1998), *Working in Partnership*, Aldershot, Gower.
- Burnes, B., and New, S. J. (1996), 'Understanding supply chain improvement', *European Journal of Purchasing and Supply Management*, 2 (1), pp. 21–30.
- Burrough, B., and Helyar, J. (1990), *Barbarians at the Gate: the fall of RJR Nabisco*, London, Arrow.
- Cascio, J., Woodside, G., and Mitchell, P. (1996), *ISO 1400 Guide*, London, McGraw-Hill.
- Charter, M. (1992), *Greener Marketing*, Sheffield, Greenleaf.
- Christie, I., and Rolfe, H. (1995), *Cleaner Production in Industry: integrating business goals and environmental management policy*, London, Policy Studies Institute.
- CIPS/BIE (1993), *Buying into the Environment*, Stamford, Chartered Institute of Purchasing and Supply.

- Cyert, R. M., and March, J. G. (1963), *The Behavioural Theory of the Firm*, Englewood Cliffs NJ, Prentice Hall.
- Davis, G. (1994), 'The delisting of products by retail buyers', *Journal of Marketing Management*, 10 (6), pp. 473–93.
- DeSimone, L. D., and Popoff, F. (1997), *Eco-efficiency: the business link to sustainable development*, Cambridge MA, MIT Press.
- Dobler, D. W., Burt, D., and Lee, L. (1990), *Purchasing and Materials Management*, fifth edition, New York, McGraw-Hill.
- Dodgson, M., and Rothwell, R., eds (1994), *The Handbook of Industrial Innovation*, Cheltenham, Elgar.
- Eatwell, J., Milgate, M., and Newman P, eds (1987), *The New Palgrave: a dictionary of economics I*, London, Macmillan.
- Ekins, P. (1992), *Wealth beyond Measure: an atlas of new economics*, London, Gaia Books.
- Elkington, J., and Hailes, J. (1998), *Manual 2000: life choices for the future you want*, London, Hodder & Stoughton.
- Elliot, R. (1994), 'Exploring the symbolic meaning of brands', *British Journal of Management*, 5, special issue, pp. 13–S19.
- Faris, C. W. (1967), 'Market segmentation and industrial buyer behaviour', *Proceedings of the American Marketing Association*, 25, pp. 108–10.
- Farrell, P. V. (1954), *Fifty Years of Purchasing: the story of NAPA*, New York, Shipman Medalists, NAPA.
- Flynn, L. R., and Goldsmith, E. (1994), 'Opinion leadership in Green consumption: an exploratory study', *Journal of Social Behaviour and Personality*, 9 (3), pp. 543–53.
- Ford, D., ed. (1990), *Understanding Business Markets: interaction, relationships and networks*, London, Academic Press.
- Foster, C. (1999), 'Environmental Issues in R&D Management: the influence of the Green agenda on the innovation process', unpublished M.Phil. dissertation, Manchester School of Management, UMIST, Manchester.
- Freeman, C., and Soete, L. (1997), *The Economics of Industrial Innovation*, third edition, London, Pinter.
- Friedman, J. (1994), *Consumption and Identity*, New York, Harwood.
- Gabriel, Y., and Lang, T. (1995), *The Unmanageable Consumer: contemporary consumption and its fragmentation*, London, Sage.
- Gallaroti, G. M. (1995), 'It pays to be Green: the managerial incentive structure and environmentally sound strategies', *Columbia Journal of World Business*, 30 (4), pp. 38–57.
- Green, K., McMeekin, A., and Irwin, A. (1994), 'Technological trajectories and R&D for environmental innovation in UK firms', *Futures*, 26 (10), pp. 1047–59.
- Green, K., and Miles, I. (1996), 'A clean break? From corporate R&D to sustainable technological regimes' in Welford, R., and Starkey, R. (eds), *Business and the Environment*, London, Earthscan.
- Greenwald, D., ed. (1994), *The McGraw-Hill Encyclopedia of Economics*, second edition, New York, McGraw-Hill.
- Greer, J., and Bruno, K. (1996), *Greenwash: the reality behind corporate environmentalism*, Penang and New York: Third World Network and Apex Press.
- Gregory, C. A. (1987), 'Consumption and production', in Eatwell, J., Milgate, M., and Newman, P. (eds), *The New Palgrave: a dictionary of economics I*, London, Macmillan.

- Hånkansson, H., ed. (1982), *International Marketing and Purchasing of Industrial Goods: an interaction approach*, Chichester, Wiley.
- Harland, C. M. (1996), 'Supply chain management: relationships, chains and networks', *British Journal of Management*, special issue (March), pp. S63–S80.
- Heinritz, S., Farrell, P. V., Giunipero, L., and Kolchin, M. (1991), *Purchasing Principles and Applications*, eighth edition, Englewood Cliffs NJ, Prentice Hall.
- Hillier, T. J. (1975), 'Decision making in the corporate industrial buying process', *Industrial Marketing Management*, 4, pp. 99–106.
- Hogg, M. K., and Mitchell, P. C. N. (1996), 'Identity, self and consumption: a conceptual framework', *Journal of Marketing Management*, 12, pp. 629–44.
- Hollander, S. (1986), 'The relevance of John Stuart Mill', in Collison Black, R. D. (ed.), *Ideas in Economics*, London, Macmillan.
- Horowitz, D. (1992), *The Morality of Spending: attitudes toward the consumer society in America, 1875–1940*, Chicago, Dee.
- Howard, J. A., and Sheth, J. N. (1969), *The Theory of Buyer Behaviour*, New York, Wiley.
- Howes, R., Skea, J., and Whelan, B. (1997), *Clean and Competitive? Motivating environmental performance in industry*, London, Earthscan.
- Irvine, S. (1989), *Beyond Green Consumerism*, London, Friends of the Earth.
- Kearney, A. T. (1994), *Partnership or Power Play?* London, Kearney.
- Knopf, K. A. (1991), *A Lexicon of Economics*, New York, Academic Press.
- Krut, R., and Gleckman, H. (1998), *ISO 14001: a missed opportunity for sustainable global industrial development*, London, Earthscan.
- Lamming, R. (1993), *Beyond Partnership: strategies for innovation and lean supply*. Hemel Hempstead, Prentice Hall.
- Lawson, T. (1997), *Economics and Reality*, London, Routledge.
- Livesey, F. (1993), *Dictionary of Economics*, London, Pitman.
- Lloyd, A., Dale, B. G., and Burnes, B. (1994), 'Supplier development: a study of Nissan Motor Manufacturing (UK) and their suppliers', *Proceedings of the Institution of Mechanical Engineers*, 208, pp. 63–8.
- Macbeth, D. K., and Ferguson, N. (1994), *Partnership Sourcing: an integrated supply chain approach*, London, Pitman.
- Machlup, F. (1967), 'Theories of the firm: marginalist, behavioural, managerial', *American Economic Review*, 57, pp. 1–33.
- Miller, D. (1995), *Acknowledging Consumption: a review of new studies*, London, Routledge.
- Miller, D. (1997), *Material Culture and Mass Consumption*, Oxford, Blackwell.
- Miller, D. (1998), *A Theory of Shopping*, Cambridge, Polity Press.
- Narotzky, S. (1997), *New Directions in Economic Anthropology*, London, Pluto Press.
- National Research Council (1997), *Environmentally Significant Consumption: research directions*, Washington DC, National Academy Press.
- New, S. J. (1994), 'Supply chains: some doubts', in *Proceedings of the Third Annual Conference of IPSERA*, Cardiff, April, pp. 345–62.
- New, S. J., Green, K., and Morton, B. (1998), 'Green supply: private versus public sector responses', in Coughlan, P., Dromgoole, T., and Peppard, J. (eds), *Operations Management: future issues and competitive responses*, papers from the fifth International Conference of the European Operations Management Association, Trinity College, University of Dublin, June, pp. 339–44.
- Pearce, D., ed. (1992), *Macmillan Dictionary of Modern Economics*, fourth edition, London, Macmillan.

- Porter, M. E., and van der Linde, C. (1995a), 'Green and competitive: ending the stalemate', *Harvard Business Review*, September–October, pp. 120–34.
- Porter, M. E., and van der Linde, C. (1995b), 'Toward a new conception of the environment–competitiveness relationship', *Journal of Economic Perspectives*, 9 (4), pp. 97–118.
- Poster, M. (1988) *Jean Baudrillard*, Cambridge, Polity Press.
- Provan, K. G., and Gassenheimer, J. B. (1994), 'Supplier commitment in relational contract exchanges with buyers: a study of inter-organisational dependence and exercised power', *Journal of Management Studies*, 21 (1), pp. 55–68.
- Redclift, M. (1996), *Wasted: counting the costs of global consumption*, London, Earthscan.
- Robinson, P., Faris, C., and Wind, Y. (1967), *Industrial Buying and Creative Marketing*, Boston MA, Allyn & Bacon.
- Rutherford, D. (1992), *Dictionary of Economics*, London, Routledge.
- Sagoff, M. (1995), *The Ethics of Consumption*, College Park MD, University of Maryland.
- Sako, M. (1992), *Prices, Quality and Trust: inter-firm relations in Britain and Japan*, Cambridge, Cambridge University Press.
- Sawyer, M. C. (1993), 'The nature and role of the market', in Pitelis, C. (ed.), *Transaction Costs, Markets and Hierarchies*, Oxford, Blackwell.
- Scheuing, E. (1989), *Purchasing Management*, Englewood Cliffs NJ, Prentice Hall.
- Schwartz, J., and Miller, T. (1991), 'The Earth's best friends' *American Demographics*, 13 (2), pp. 26–35.
- Sheth, J. N. (1973), 'A model of industrial buying behaviour', *Journal of Marketing*, 37, pp. 50–6.
- Sheth, J. N. (1977), 'Recent developments in organisational buying behaviour', in Woodside, A. G., Sheth, J. N., and Bennett, P. D. (eds), *Consumer and Industrial Buying Behaviour*, New York, North-Holland.
- Simon, F. L. (1992), 'Marketing Green products in the Triad', *Columbia Journal of World Business*, autumn–winter, pp. 268–85.
- Sloman, J. (1994), *Economics*, second edition, New York, Harvester Wheatsheaf.
- Tidd, J., Bessant, J., and Pavitt, K. (1997), *Managing Innovation: integrating technological, market and organisational change*, Chichester, Wiley.
- Veblen, T. (1899), *The Theory of the Leisure Class*, New York, Macmillan.
- Vergragt, P., and van der Wel, M. (1998), 'Backcasting: an example of sustainable washing', in Roome, N. (ed.), *Sustainability Strategies for Industry: the future of corporate practice*, Washington DC, Island Press.
- Wagner, S. A. (1997), *Understanding Green Consumer Behaviour*, London, Routledge.
- Warde, A. (1997), *Consumption, Food and Taste*, London, Sage.
- Webster, F. E. (1965), 'Modelling the industrial buying process', *Journal of Marketing Research*, 2, pp. 370–6.
- Webster, F. E., and Wind, Y. (1972), *Organisational Buying Behaviour*, Englewood Cliffs NJ, Prentice Hall.
- Weizsacker, E. von, et al. (1997), *Factor Four: doubling wealth, halving resource use*, London, Earthscan.
- Wikstrom, S. R. (1997), 'The changing consumer in Sweden', *International Journal of Research in Marketing*, 14 (3), pp. 261–74.
- Willums, J-O. (1998), *The Sustainable Business Challenge*, Sheffield, Greenleaf.