

The Socio-Economic Dimensions of Recycling Policy

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**Seminar on the Consumption of Recycled Products:
European Policy and Local Stakes**

Brussels April 27th 2000

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Recycling policy in the UK, as in many countries, is primarily considered as an aspect of waste policy and assessed in environmental and financial terms. Both at national and local levels, its potential as an instrument of economic and social policy is largely ignored. Though there have been some studies done on the employment impact of recycling, the key decisions on whether to respond to the Landfill Directive by building incinerators rather than adopting intensive recycling are determined by organisational interests, the availability of finance, and politics. I know of no waste disposal authority in the UK where the impact of intensive recycling on industry, employment, urban regeneration or social exclusion has had any weight in decision making, nor of any British regeneration agency which has promoted recycling as a sector. At national level in the UK there remain contradictory approaches between the Department of the Environment, the Treasury and the Department of Industry, and no connection at all to sections of Government dealing with employment and welfare. Recycling is a paradigmatic case of the need for joined up government and the difficulty of bringing it about.

The only surprising thing about the British case is that, being a latecomer with a municipal recycling rate of only 9%, it is in a position to see the socio-economic advantages of recycling where it has been pursued intensively elsewhere. It could also observe how economic and social policy can inform the way in which recycling is introduced. But the fracturing of government at both national and local level means that recycling remains firmly rooted in Departments of Waste and/or the Environment. It is assessed not as a new economic sector but as an alternative means of waste disposal. It is financed – as far as household recycling is concerned – within the parameters of waste budgets and locked within the structures of a sector that for more than a century has been isolated from the mainstream market.

One result of this is that waste departments (and many waste companies) have found it difficult to adjust to the market relations which recycling demands. For municipal waste officers, markets present themselves as a problem, both because of the uncertainty they introduce into the stable framework of public sector budgets, and because waste officers lack access to market knowledge and expertise. Waste companies, too, whose traditions and culture are largely those of waste disposers, treat markets primarily as alternative disposal outlets not as the lodestar around which the recovery of secondary materials should be organised. As a result, markets have been regarded as one of the major limitations of recycling as a 'waste option'. If recycling rates are to be raised from 9% to 30% in a decade, as outlined in UK policy, the warning is given that markets will have to be expanded threefold, a task that is daunting to politicians and waste managers alike.

These fears run counter to the central concerns of economic development, which are to identify potential sources of growth. Which Development Agency has not searched for a sector which is forecast to grow more than threefold within ten years? Which could regard such potential growth as an argument against support for the sector, and in favour of a non-market, declining sector option? Yet this is the position in the UK (and in Ireland) as local and regional governments respond to the Landfill Directive. Whereas in North America the number of mixed waste incinerators has declined sharply and new construction has all but ceased, in Europe the Landfill Directive threatens to revive the sector and in doing so pre-empt the expansion of recycling and the economic growth associated with it. This is happening because the expansion of recycling is still bound to the apparatus and outlook of waste management, and because economic and social policy has had so little influence in determining the direction of waste development.

Waste and the economy

The reason for the subordination of economic and social considerations in the framing of waste policy is historical and institutional. For much of the twentieth century waste was of marginal economic importance. It was a material terminus, with only a one-way connection to the rest of the economy, at best filling up holes which had been left by

quarrying or generating marginal heat from its process of combustion. For the private economy it was a cost of production. For the domestic sector, its costs were covered by the state. The waste sector itself was a backward industry, run by transport or quarrying-related firms.

The growth of recycling and waste minimisation changes all this. By replacing linear with circular flows of materials, it re-connects the waste sector to the wider economy. As the waste sector emerges from its ghetto, a whole series of new problems are posed. Producing materials for a range of markets and managing those markets, is just one. Re-organising collection and sorting of multiple materials rather than a single flow of aggregated waste is another. Transforming information systems and skills to these new tasks is a third. There is also the major issue of how to relate an industrial process of recovering materials to the household economy which is where source separation begins.

These are issues common to the restructuring of many contemporary industries – from energy to education and health care. They are not arguments against modernisation, but an identification of what it entails. To transform itself into a recycling industry, the waste sector has a set of new production and logistical challenges (similar to those industries which have moved from mass production to flexible manufacturing) and a new set of interfaces. It needs to shed its background in simple freight movements, and adopt the practices of the most modern sectors, capable of managing quality and flow in complex systems.¹

Environmental and public health issues were always central to waste and are the reason for the state's traditional role as a regulator and source of finance. They will remain so, but instead of determining the regulation and management of waste separate from the economy as in the past, they become a prime mover of the new materials economy. From being peripheral to the mainstream economy, managed to minimise costs and environmental damage, waste becomes a driver of resource productivity and hazard

¹ The parallels between the changes required in the waste industry and those introduced by Japanese automanufacturers are discussed in R. Murray et al. *Re-Inventing Waste*, Ecologika, 1998 Chapter 6.

reduction in the rest of the economy. Just as the information revolution affects all parts of the 'weightless' economy, so waste minimisation touches all parts of the material economy. It becomes a key entry point to transform resource use.

Under the new resource paradigm waste assumes a twofold economic function:

(i) it contains secondary materials which can be recovered and reprocessed as part of a 'closed material loop'. This can be termed a 'static material cycle'.

(ii) it highlights questions about the safety and resource productivity of the processes from which the waste arises, and the incremental value potential of recovered material. Waste acts as a trigger of innovation, prompting a 'dynamic material cycle.'

Closed material loops

The first of these is not new, but it has been pushed forward to a new stage. In 1990 only a third of all paper and paperboard used in the US was recovered. By 1996 it had risen to 45% and is now nearly a half, with 68% of old newspapers now being recycled and 73% of cardboard. For steel cans the recovery figure is 61%, for aluminium 67%. Germany has now reached 80% for its steel cans, and there are similar levels for glass bottles in Germany, Holland and Switzerland. These are examples of the expansion of secondary materials. As a sector, it has required new collection and sorting systems, and new technologies for disassembly processes such as de-inking and de-tinning.

For any economy dependent on raw materials this shift to secondary materials has a major impact. In effect it creates secondary mines and forests, and allows the recovered resources to be substituted for imports. In Britain, even though it has lagged in this shift, it has already led to the regeneration of the paper industry and the establishment of the largest aluminium can recovery plant in Europe. The economic and employment effects of this revival are substantial. A study in the mid 1990s by Professor Pearce estimated that a 280,000 tonne newsprint mill created over 1,400 mill related jobs, with a further

2,800 coming through the income multiplier. For the UK this would mean that recycling 2.1 million tonnes of currently unrecovered newspapers would generate 24,000 jobs, one third of them paper related, and have a positive balance of payments effects of £453 million. By comparison incinerator capacity to dispose of this quantity of paper would only employ directly some 250 people.²

For countries farther down the recycling road, the economic and employment impact - without the multiplier effects - is even more striking. The Dresdner, Kleinwort, Benson bank estimated that the waste and recycling industry in Germany now employed 150,000 people, 17,000 of them in packaging recycling alone. A study of ten North Eastern states in the US calculated that recycling had added \$7.2 billion in value to recovered materials through processing, and that recycling industries employ 103,000 people. Studies of particular US states give a similar picture, 18,000 jobs in recycling related industries in Washington state, at least 18,000 in Minnesota, 10,000 in Pennsylvania and so on.³ My estimate for the UK is that intensive recycling would create 15,000 net new jobs in collection and sorting, and at least 25,000 - 40,000 jobs in manufacturing and reprocessing. These are modest indicators of the significance of the expanded secondary materials sector.⁴

Upcycling and eco-design

Establishing 'closed material loops' is the first stage in the new materials economy. But it is already prompting a second stage - the 'dynamic materials cycle'. One aspect of it is to develop new uses for recovered materials which retain or enhance the value already in them (upcycling) rather than return them to their original cycle or inferior use (downcycling). The Clean Washington Centre has worked with local industries which could potentially substitute recycled for primary inputs, and developed new uses accordingly (the use of recovered glass as an abrasive or filtration medium for example,

² British Newspaper Manufacturers Association, *Recycle or Incinerate: the Future for Used Newspapers*, 1995, Annex II section 2.

³ For a summary of the US evidence see R. Murray, *Creating Wealth from waste*, Demos, 1999, pp 72-74

⁴ op. cit. Chapter 4

or of tyres for surfaces). In each case the condition is that the recycled material or composite is equal to or better in quality and/or lower in price than the material it is displacing.

The drive to minimise waste further forces changes in product design. Cars, white goods, building construction and packaging are all under pressure to modify their design to facilitate re-use and recycling, to use renewable materials and to minimise hazards. Processes are under development which allow ink to be floated off paper and re-used. Inks themselves are being made with bio-degradable materials (three quarters of US newspapers now use soya based inks). Starch and sugar are being used instead of petroleum in plastics. What has been happening is that environmental waste collectors have been acting as the whistle blowers on the material manufacturers. If a product is difficult to recycle or dangerous to dispose of, the demand is made on the manufacturer to change. Hazard reduction, resource conservation, and recyclability have become the drivers of the new eco-design.⁵

From the old industrial paradigm to the new

There is a real danger that incineration will ‘crowd out’ these dynamic effects. As a technology of material destruction incineration raises problems of its own which drive its technological development. Emission problems are countered by raising the heat of combustion, and introducing new scrubber technology. Ash contamination is addressed through increased investment in hazardous disposal systems. But no sooner has one contaminant been identified, measured and reduced, than new ones emerge – a recent example is brominated flame retardants – or old ones persist unmeasured and untouched.⁶

⁵ Eco-design is discussed primarily in relation to reduction. But it is equally important in facilitating re-use and recycling, and should be seen as the dynamic element in waste minimisation, rather than attached to any one part of the minimisation process.

⁶ There is also the problem of the effective control and monitoring of these hazardous processes. An increasing number of waste scandals have recently been brought to light in the UK, related to landfill and incineration, which have shown up the inadequacy of regulative structures. In the case of the illicit dumping of contaminated waste in Manchester the main regulative body, the Environment Agency, confessed that they lacked the resources to police the regulations. (The Guardian 6th April 2000, and the same newspapers report on April 5th on the inadequacy of landfill tax regulation.) A major Guardian report

The politics and economics of the incinerator industry is not centred on the reduction of hazardous inputs: there has been no move by the operators to go back up the pipe to promote source separation and the ‘cleaning’ of the waste stream that enters the burners. Rather resources are spent on contesting the claims of hazards in the politics of information, and containing them through the economics of innovation. These are the dynamics of the old industrial paradigm: of the nuclear industry, the chemical industry, and of modern food production.

Recycling and waste minimisation on the other hand are emerging as key to one of the core technologies of the new industrial paradigm – centred on the increased safety and productivity of materials use. To date, the potential of new materials technology has been less recognised than the other two core technologies of the current wave – information and bio-technology. It has been later in starting, and is being driven less by technology than by environmental imperatives. Yet like the electronic and bio-tech revolutions, it promises to reach into every sector of the economy, and combine with them in redrawing geographical and organisational maps. As the Factor Ten club have argued, there is the potential for the kind of radical increases in material productivity that were achieved for labour productivity in previous industrial eras.⁷

Major advances in material productivity require a cyclical rather than a linear view of production, with the life and productivity of materials becoming the focus of attention. Whereas the era of mass production focussed on products and their life cycles, the new materials economy sees products as passing forms taken by re-worked materials. Environmentalists have emphasised the importance of re-usable products. The ‘new

on the failure of the regulative bodies to control landfill tax infringements can be found on www.newsunlimited.co.uk/landfill. For the most recent case concerning the inadequate monitoring of toxic incinerator ash that had been spread on garden allotments in Newcastle see the Guardian 8th May 2000.
⁷ E. von Weizacker, A.Lovins and L.H. Lovins, Factor Four, Doubling Wealth, Halving Resource Use, Earthscan 1997, and P.Hawken, A. Lovins, L.H.Lovins, Natural Capitalism: the Next Industrial Revolution, Earthscan 1999

materialism' emphasises the importance of re-usable materials. Material cycles replace product cycles as the central concept for increased materials productivity.⁸

Waste is a symptom and recycling a way into the deeper structures of material production and material use that are the subject of these transformations. Incineration and other forms of waste disposal run against the grain of the materials productivity approach. Although they are often presented as part of the new cyclical paradigm, with front end recovery, energy generation, and the recycling of waste, these are all low level by-products of the process of mass waste destruction and examples of material loss and down cycling. Waste minimisation on the other hand, by disaggregating waste into its component parts and asking how each can be minimised, sends a range of questions back to producers and consumers which become the basis for economic change. Approached in this way waste is transformed from something to be got rid of, to a reservoir of materials, a hazards laboratory and a spur to innovation.⁹ This is its prime importance for economic development.

The social significance of recycling

As with all industrial change of this magnitude, it can be introduced in a variety of ways, with differing social consequences. It involves the destruction of some jobs and the creation of others, each with its own geographical and social mapping. In the case of waste, the path of chemico-energy modernisation concentrates employment in the capital goods sector, maintaining the traditional systems of waste collection and residual disposal. The key social issues that arise do not concern employment but environmental equity, and the distribution of risk associated with the waste treatment and disposal processes. Where incinerators have been built or retained it is principally in old industrial

⁸ A pioneer of these ideas both in theory and practise is the German chemist Michael Braungardt. For a summary of his views see M.Braungardt and W.McDonough, Design for Re-Incarnation, Resource, April 2000 (available from the CRN, 10-12 Picton St, Bristol, BS6 5QA, UK)

⁹ Nappies make up 4% of the UK domestic waste stream and one of the nasties of the residual dustbin. One response has been to introduce re-usable nappy services. Another to recycle the fibres in the nappy in an enclosed plant. A third is to develop a bio-degradable plastic coated nappy which is then processed through wormeries to provide soil nutrients. Each of these is an innovation in product or service.

zones which are historically low income areas – Coventry, Dudley, Newcastle, Cleveland, Bolton, Sheffield, Dundee, Haringey/Enfield and Lewisham. Middle class areas, particularly in the South of England, have been to the fore in opposing the new wave of incinerators currently being proposed, in campaigns which are now matching in intensity those opposing nuclear power.¹⁰

Recycling itself takes different forms. On the one hand it can be introduced without changing the organisational structures of the former waste industry, with similar systems of collection, and mechanised sorting, supplemented by hand sorting in centralised MRFs, and centralised processing. In the worst cases – so called dirty MRFs – the jobs created are both monotonous and hazardous. An unpublished study by the Federal Agency of Workplace Safety in Germany found that waste sorting stations were among the country's most unhealthy workplaces.¹¹

On the other hand, recycling and composting can be organised as networks of decentralised activity, with kerbside collection and sorting, local bulking/sorting stations and compost facilities, and local and regional reprocessing. This model has quite different employment and social implications from incineration or industrialised recycling. First, it transforms the role of the collector, creating a new type of green collar work. In place of the unskilled dustman, the 'green' collectors require skills in householder relations, logistics, material know how, and management information systems. As in Japanese production systems, the front line worker becomes the prime guardian of quality control and a source of ideas on process innovation. There is also a key function of householder advice (both on source separation and home composting) which can be played by the collector or by specialist home advisers. In the best schemes in the UK the front line jobs

¹⁰ Friends of the Earth have recently confirmed this finding more generally by correlating official industrial emissions data with income data by postcode. They found that the poorest families with incomes under £5,000 a year were twice as likely to live near a polluting factory as households with incomes over £60,000 a year. In some cases there are historical reasons for this correlation. In the case of incinerators – where all but six were closed down by 1996 as the result of the EU Directive – the distribution reflects income based differences in environmental politics.

¹¹ T.Evans, Recycling in Germany, in: R. Murray et al. Re-inventing Waste, op cit. Annex 2.

have not only involved upskilling and multi tasking, but they have opened up waste collection to women.¹²

Secondly, ‘distributed’ recycling has opened the sector up to community business. Evidence from the UK and North America suggests that community collection achieves higher participation and capture rates than local authority or private waste company collection. This is both because the community sector has a different culture to industrialised collection, closer to the household economy with which it is dealing. Householders have also shown themselves more willing to undertake the home sorting required if the collectors are a community enterprise.¹³ The community sector has also played a significant role in the development of re-use, local disassembly and re-processing – in sectors as divergent as nappy laundering, paper manufacture, electronic and white goods disassembly, charcoal production and community composting.¹⁴

Thirdly, recycling is a significant instrument for economic regeneration. Whether the place is a coastal town losing its fishing industry, or a city region facing the run down of mass production complexes, recycling provides an immediate alternative. Not only are collecting and sorting local (and generate an estimated 122 permanent net jobs for a town of 200,000), but so is a significant part of processing. Composting, some parts of plastic reprocessing, textile recycling, electronic and electrical disassembly, wood recovery, and the recycling of construction and demolition waste are all activities which can be targeted to areas of employment need. There has also been a significant growth in urban mini-paper mills, whose disadvantages of production scale are counter-balanced by savings from the use of existing urban infrastructure and from economies of proximity to the

¹² S.Brown, “Women in Waste”, Resource, April 2000, p.17

¹³ In the UK, the community sector provides kerbside collection of recyclables to over one million households. In the case of London where community recyclers cover 7 of the 32 London boroughs, the community based Islington Wastesaver have the highest capture rate for dry recyclables of any of London’s kerbside collection schemes.

¹⁴ For a discussion of the potential of recycling for community economic development see R.Murray et al. Re-Inventing Waste, op. cit. Chapter 14.

secondary material sources and final markets.¹⁵ Secondary materials recovery is thus by its nature a distributed activity, offering a range of types of employment.

Recycling can be introduced in ways which offer a quadruple dividend: environmental, economic, social and geographical. At a policy level each of these issues is the responsibility of a different Department or Ministry, but it is the waste ministries which have remained dominant.

Industrial Policy

The argument of this paper is that economics can no longer be considered a subsidiary dimension of waste and recycling policy, but should stand at the heart of it. It does not displace environmental considerations, but is the means for realising them. The re-orientation of the waste sector towards resource productivity and 'safe production', brings it in from the cold and places it at the centre of a major process of industrial change.

It is at this point that the traditional separation of waste from the mainstream economy (and its sections of government) can become a liability, particularly if waste policy is determined with little regard to its social or economic importance, and is rather subject to the politics of particular interests formed in the old order. Given that the environmental case for recycling and resource economy is now well established, it is economic policy which should be developed to promote this change.

We know from the extensive literature on industrial restructuring, that such change is extraordinarily difficult to bring about. It is made doubly difficult in the case of waste, because the new economy runs across a number of sectors and there are no economic actors – firms or states – which can bring about the change on their own. A small number of steel firms could restructure their industry in the 1930s through agreement between

¹⁵ The Bronx area of New York has recently constructed a community –private sector recycling paper mill, the first industrial development in the area since 1947.

themselves. This is not the case with recycling. A number of the reprocessing industries have established their own supply lines – for doorstep paper collection for example, or bottle and can banks. But there is little contrary movement (I am not aware of waste companies which have integrated forward into manufacturing) and cross sectoral alliances have been limited.

For recycling and waste minimisation to achieve its full economic and social effects, it needs to free itself from the apparatus and outlook of traditional waste management. In some sectors such as information technology the shift from the old to the new has been achieved primarily through the market, with public policy lagging behind private initiatives. But in the waste sector public policy and waste finance have always played such a key part in the industry, and the local and central governments departments are themselves so bound up with the old order of waste management, that it has been difficult for waste to develop its own versions of ‘Silicon Valley’ through the market. With waste policy being framed round the structures and financial requirements of the old industry, there has been little incentive for the major waste companies to transform themselves, or for modern industrial sectors to enter the waste sector.¹⁶ As with all major industrial changes, the key issues are less technological than organisational. How can the economic and regulatory structures built round one economic paradigm be transformed to facilitate a new one?

There is no escaping this question. The tenets of neo-liberal industrial policy which relied on reducing the role of the state in the economy do not apply to waste. As with other environmental industries, the state is becoming more rather than less involved in waste. It is a sector which runs against the contemporary grain. Whereas there is a more general move in the economy to de-regulation, waste is subject to more regulation. Rather than tax reduction, there are tax increases. Whereas globalisation favours the removal of trade barriers, the waste sector is subject to pressures for more stringent barriers and reduced

¹⁶ A Merrill Lynch report on the waste sector in Britain (Pollution Control, September 1998) found the economic hierarchy in waste management based on relative profitability almost the exact reverse of the environmental hierarchy, with landfill as the most profitable and recycling as the least.

international trade. The proximity principle is directly contrary to the basic tenets of trade theory, with respect to specialisation, scale and the free movement of commodities, and discourages even inter-regional trade. In this sense waste is a peculiar sector in which the state cannot avoid playing a determining economic role.

The main force for change therefore has to come from public policy, and the introduction of regulations on the disposal of waste and its recycling. In waste, Governments are in charge of directing the traffic. In doing so, they themselves are having to restructure. Their original role was a protective one. Waste was made into a state service to ensure public health by controlling the way in which waste was disposed of. Now the demands have changed. Government is no longer dealing solely with the debris from the mainstream economy, to be carried away and disposed of separately at public expense. It is being required to engage with the central production and consumption processes of the mainstream economy itself. The issues demand a shift from 'protective regulation' to the developmental state.

This shift poses extraordinary challenges to economic policy – which has not had a good record in transforming production. But the past ten years has seen the emergence of a 'new industrial policy' which together with innovations in environmental economics opens up radical changes to the way in which governments can shape the path of industrial growth and the accompanying social development. They include the following:

- a) phased regulation to promote innovation
- b) the partial financing of teams of 'animators' and technical advisors to facilitate innovation
- c) the encouragement of inter-firm, and inter sectoral co-operation, through joint programmes or consortia in sectors centred on small and medium enterprise

- d) the partial financing of new infrastructure or economic services required by the developing sector (price stabilisation mechanisms for example, investment guarantees, testing laboratories and independent product development centres)
- e) the establishment of time limited entrepreneurial agencies, including venture capital funds, to encourage new connections and secure 'system coherence'.
- f) the use of public procurement as a lever for innovation
- g) the encouragement of third sector players in the sectors, operating within the market, but with social and environmental goals
- h) hypothecated taxes on the old industry to provide finance for the new
- i) new forms of public budgeting and administration, including inter-ministerial bidding for central finance to encourage cross departmental working, and bidding programmes for external partnerships to deliver multiple policy objectives.
- j) new concepts of property to include responsibility for social and environmental costs associated with 'quiet enjoyment'
- k) the recognition of the role of consumers as a lever of change.

The key concept guiding policy is that of the productive system. For new productive systems to come into being, contemporary industrial policy recognises that the state plays a necessary role in parts of the system - in providing a new regulatory regime, for example, or transitional finance, or providing incentives for innovation. But equally important is the leadership role it can play in forming a cross-sectoral alliance of those who have a capacity and interest in establishing the new order. It is not a question of the state compensating for the failure of the market, or of pitting the public against the private. It is rather an issue of establishing a socio-economic coalition which is capable of

transforming the public, private and social institutions within which the market is embedded.

This is not the place for a full discussion of the new industrial policy as it applies to the waste sector, save to note that the above principles all have a place. Rather I want to discuss how this approach bears on the relationship of consumption to the expansion of recycling and the new materials economy.

The role of consumers in the new materials economy.

There are three principal questions to consider. First, can consumption – or to put it in terms of the agents, consumers – play an independent role in promoting the new materials economy? Secondly, even if the main impetus for change comes from designers and producers, what changes are needed in consumption to enable the new forms of production to expand without impediments? Thirdly, what if anything can public policy do to influence consumption in the required way?

Consumers as agents of change.

In previous industrial eras, innovations in production have been the prime movers of change, as they are at the present time in information, communications and bio technology. The pressure for environmental innovation, however, has come from civil society, translated both through political channels and through the economy via consumption. Environmental activists have pioneered new models of consumption, (and – where the market could not deliver – of production) in fields as diverse as energy, water, health, transport, food, forestry and waste. In each of these areas they have had a major influence, demonstrating the possibility of alternatives in practice, at the same time as developing a critique of mainstream production, and mobilising consumer power to change it.

One of the most striking recent examples is the food industry, which in the UK and Japan at least has been transformed in this way over the past fifteen years. In both cases the consumer movement began as a critique of the existing food system, demanded improved labelling and food production practises, and opened the way for alternative local/organic production to expand. In the Japanese case the move to organic farming was orchestrated by consumer co-ops (with 12 million members) which built an independent home delivery distribution system and a network approved suppliers as the result of consumer distrust of mainstream brands. In the UK, the supermarkets were quicker to respond to the demands of the food movement as transmitted through consumer pressure and have devoted increasing quantities of shelf space to organic foods.

What distinguished food politics in Britain was the targeting not just of Governments but the economy. Independent research and information played a key role here, and led to a succession of food scandals from salmonella in eggs to BSE. In other sectors, like transport, energy or health, where markets are managed or heavily regulated by the state and less open to consumer market campaigns, social movements developed their own systems of consumption and production, which contributed to the pressure for change.

A number of things can be learnt from these examples when it comes to waste and recycling. First, the consumer is also a producer. Whether in gardening or preparing food, or improving home energy efficiency, or composting and sorting recyclables, the distinction between consumers and producers becomes blurred. From the viewpoint of the recycling economy, consumers are unequivocally part of the production chain, in the same way as they are in preventative health and education. In each case, consumers take things into their own hands.

Second, the consumer is also a new form of politician. To actively engage in different ways of doing things for environmental ends provides a way for citizens to do more than pay taxes and vote. It offers a space for what can be called 'productive democracy', which in turn influences both the economy (through consumer power) and politics itself. One of the interesting results of householder surveys of recycling schemes, is that

participation in recycling raises awareness of environmental issues associated with recycling and increases support for political programmes which address them. Active participation is its own form of social marketing and political dialogue.

Thirdly, there are marked differences in the way different sections of the population respond to these issues. Opinion polls and focus groups indicate that the degree of commitment runs from a small proportion of pioneers ('the ethicals'), a larger group of people who would be willing to recycle or buy green products if the quality was good and the price premium no more than 10% (semi-ethicals) a further tranche who would buy green if quality and price were equal, and a disinterested residual. For ethical products the proportions are approximately 5%, 25%, 40% and 30% respectively. The balance will vary by country, and by subject matter. In general, the more the issue bears on the consumer personally – people suffering from allergies will seek out organic foods, those threatened by incinerators will be more active recyclers – the greater the number of ethicals and semi-ethicals. Conversely, where commitment is marginal, it is even more critical that the alternatives are economic and convenient. Convenience is a major factor in the success of recycling programmes.

Fourthly for consumer power to extend beyond its 'ethical' fraction, alternative products have to compete on quality and price. Products will not sell in sufficient quantities if they are marketed on a green or ethical basis alone. The challenge for alternatives to mainstream disposable nappies for example is to produce a service which is broadly equivalent in convenience and price. The same is true for recycled office paper or for compost. Too often composting has been treated as an alternative form of disposal, rather than being market led in terms of product specification and the required quality of input. This point is reflected in a change in green and ethical marketing strategies from a product's environmental/ethical desirability towards an emphasis on its quality.

Fifthly the most successful initiatives are those which have appealed to individual as well as solidaristic and altruistic interests. Food safety and personal health have been the key factors behind the expansion of organic consumption for example. It is not that there is a

conflict between the individual and the social, merely that it has been more effective if wider social concerns can be linked to individual ones. This suggests that recycling – promoted because of its impact on resource conservation and global warming – should be paired with the drive for product safety in use and disposal. To know that a recyclable carpet has lower levels of in-house air emissions offers the consumer a double dividend.

Sixthly, green and ethical consumption needs guarantees that the product on offer embodies the values appealed to. The recycled contents of a product, like the safety of food, is not immediately apparent. It relies on information about origins. This information may be supplied directly through a range of channels: content labelling and description; complementary marketing and PR, press coverage of the nature of mainstream products, and now the web. Or it is provided through independent intermediaries who guarantee what is claimed.

Organic agriculture, sustainable forestry and ethical trade have all developed marks, which like brands, stand in for detailed information. They are a seal of approval. For organics the mark has played an important part in the growth of the sector. But there are problems with marks of this kind. Standards have to be set and once set it is expensive and time consuming to change them. This means a mark may lack flexibility to keep up with technical change. As a standard, a single mark can find it difficult to deal with diversity of circumstance, between different recycled materials for example, or the degree of upcycling achieved. None of these are insuperable, but they have led ethical traders to develop brands and a wider range of criteria and consumer information as an alternative.

In the case of the new materials economy when it is resource efficiency, recyclability, product safety as well as recycled content which are at issue it is important not to define the mark too narrowly. In Australia, New Zealand and California there is a gathering ‘zero waste’ movement, aimed initially at municipalities who undertake to achieve ‘zero waste’ within a generation. Councils sign up to a charter and adopt short and medium term targets appropriate to them, and are subject to monitoring. They are allowed to use the zero waste mark in return for a fee to cover administration and support costs. It is

now being recognised that the use of the 'zero waste' mark can be extended to companies, villages, housing estates, supermarkets or factories who make similar commitments. A 'zero waste' label of this kind which is not restricted to particular levels of recycled content may be a more appropriate instrument to use as a mark to mobilise consumer choice than the tightly defined marks of organic food and drink.

Another approach was developed by the Government of Ontario in the mid nineties to promote local green industry. It put together a catalogue of green products which were rated on a three point scale according to their environmental quality, the 'localness' of their production, their cost, and their quality (the GLCQ criteria). Linked as it was to a Green Communities programme, which provided householder advisory services for energy, water and waste, the catalogue acted as a form of independent collective marketing, and as such was in a position to negotiate price reductions for products that had been chosen for inclusion.

Because of the potential impact of these schemes, they need to be independent of the corporate and public sector. In the case of waste, they would act as 'curators' of the goal of waste minimisation, and in this role need to draw on scientific and industrial expertise and finance their own testing. In the long run the impact of such schemes on sales means that they can be largely self-financing.

In summary, the consumer movement has played an increasingly important role in sectoral restructuring in recent years. It has used boycotts and 'buy-cotts' to influence retail sales, and developed approved codes of practice and environmental 'marks'. In some instances the public awareness of the issues has been promoted through political and consumer campaigns. Others have relied on 'cause related' marketing.¹⁷

¹⁷ The growth of 'cause related marketing' is an acknowledgement by the corporate sector of the increased significance of ethical (and environmental) factors in consumer choice. See the book by two Saatchi & Saatchi executives, H.Pringle and M.Thompson, *How Cause Related Marketing Builds Brands*, Wiley,1999.

There is scope for an expanded consumer strategy along these lines to promote recycling and the new materials economy. It needs to go beyond general public campaigns to buy recycled products, to a more targeted approach, product by product. There is an interesting contrast in this respect to the way in which recycled newspaper content has been taken up as a marketing tool by individual North American publishers, as against the weaker general recycled mastheads in British papers. It also needs to adopt a wider focus on waste minimisation and product safety. As with food, it is the hazards of modern materials which provoke a stronger public response than the more general issues such as global warming. The two should be linked if consumer power is to extend beyond niche products to the mainstream market.

To promote materials awareness, the consumer movement needs its own expanded independent sources of technical information and means of circulation and publicity. This should be seen as a complement to kerbside collection, re-use and home composting schemes, with particular attention paid to hazardous materials. I have also suggested a flexible 'zero waste' mark as the focal point of a campaign addressed to product manufacturers and waste producers, but also acting as an instrument of consumer influence in the retail sector.

A new mode of consumption

Analysts of long waves of industrial change have argued that new modes of production based on generic technological innovations require new modes of consumption if they are to fully realise their potential. The era of mass production was accompanied by the emergence of mass consumption, characterised by a stable level of aggregate wages, consumer credit, and the extension of social insurance schemes. Many of the products mechanised or displaced domestic tasks, leading to an increase of materials intensity in the household.¹⁸

¹⁸ The concept of the 'mode of consumption' was first developed by the influential French economist, Michel Aglietta, in *Regulation et Crises du Capitalisme*, Calmann-Levy, 1976.

The outlines of a possible new model of post Fordist consumption are already emerging, which bear on the issue of materials. First there is a move towards 'intelligent' consumption, in which what is termed consumption can add value rather than destroy it. This is part of the previously mentioned point about consumers also being producers – in education and health most notably, but also in many of the caring activities or in transport.

In the case of environmental activities intelligent consumption can be seen as an increase in the efficiency of consumption through reduced energy or water use for example, or the conserving and recycling of materials. As with all intelligent consumption, it presupposes an active rather than a passive consumer, the need for skills and information, and the time to undertake a more labour intensive type of consumption. The result of increased 'productive' consumption is that the role of the home is extended from being a site of traditional domestic labour to an office, a centre for learning and information processing, and – as solar energy takes hold – even a power station.

The need for productive consumption time connects to changes in the structure of employment. The proposals to shorten lifetime working hours and the increase in the ratio of home based to paid work-based activity increases the scope for the new forms of consumption, whether the paid work time reductions take place in the week, the year, or the working lifetime.

The changing nature of the domestic economy may also generate new alternative economic relationships between households, from alternative currencies to joint production projects such as self-build housing. This also bears on the question of the increased utilisation of fixed capital in the home through renting, leasing, and sharing (as in the car sharing schemes that have been developing in Europe).

Environmentalists have argued that improved material cycles will depend on a considerable extension of leasing to encourage manufacturers to invest in durable and recyclable materials. This is part of a more general shift to purchasing services rather

than owning goods. Unilever have announced a new domestic cleaning service, under which they will provide the equipment, the cleaning fluids, and know-how, and propose to extend this to other household production such as gardening. In the transport field the prototype of the first recyclable car available only on lease (covering insurance, fuel and alternative capacity) has just been completed by Ford.

The point I want to raise here is that the model of mass consumption is changing to reflect the new model of service-oriented, flexible, knowledge based production. These will be open to consumer informed pressure for environmental performance, particularly with respect to energy efficiency, recycling and hazard limitation.

The contrast between the old mode and the new can be summarised as follows:

Mass consumption	Post Fordist consumption
Consumption as material destruction	Consumption as production
Passive consumer	Active consumer
Deskilling of consumer	Re-skilling of 'prosumer'
Domestic capital goods	Domestic knowledge services
Low capacity utilisation	Shared goods and knowledge
Owning	Leasing and service contracts
Primary material intensive	Secondary material intensive
Standard working time	Flexible working time
Redistribution through welfare budget	Redistribution of working time
Quantity of commodities	Quality of life

It has been clear for many years that the model of mass consumption is unsustainable as it is extended internationally. A central question for the next industrial era is whether a model of post Fordist consumption can be developed which not only reduces resource pressure in existing industrialised countries, but allows improved living standards to be extended to those living in the East and the South.

Public policy and consumption

There is a strong argument that the major environmental changes have been led initially by the action of social movements rather than by public policy or the corporate sector. They have placed previously hidden issues on the political agenda, through research, writing and political campaigning. In fields where there is a large final consumer market, they have used consumer power as one instrument to change productive practices. In waste the problem is that the principle 'markets' are the public and corporate sector, but as the growth of recycling shifts waste from an economic backwater into the mainstream market economy, it is open to a consumer movement for the first time to contribute to the transformation of the waste economy.

The question is whether there is any role for public policy in encouraging or using consumption to promote recycling, and any way that governments can give further impetus to the development of a more sustainable mode of consumption. After all, governments may follow rather than lead the social movements in environmental change, but public policy is central to generalising the initiatives taken in civil society.

There are six areas of policy which can be considered in this context:

- joint financing of an independent scientific infrastructure on materials
- the promotion of clean materials innovations through public procurement
- introducing a new incentive regime to encourage recycling
- the partial financing of a home visit programme to advise on domestic waste management and materials consumption
- the facilitation of neighbourhood services as a substitute to domestic equipment consumption

- innovations in the distribution of working time

Consumer movements are heavily dependent on access to independent scientific research capacity. While the consumer movement itself should remain independent of the state, governments at local, national and European level can contribute to the funding of an informational infrastructure on existing and alternative materials. There should be a network of independent scientific institutes and agencies (similar to the EPEA in Hamburg) established for this purpose, which could be used for testing and for developing clean materials.

Secondly, the various levels and departments of government can potentially play an important role as a core initial market for innovative clean and recyclable products. Just as the national government in the US and Japan (and the regional lander of Lower Saxony) have sought to promote photovoltaics through providing a market, so similar procedures could be adopted for example for the supply of recyclable office furniture, or of office paper using a mixture of recycled paper and hemp or straw (as a community – paper industry consortium are developing in the UK). In effect the government would run an international competition for innovation, whose winner would be encouraged to establish a plant locally with the guarantee of a core public market. It is not a question of choosing an inferior green product over a cheaper mainstream one, but of encouraging innovation which would generate products of the same or higher quality, and meet the stated environmental aims. Any initial price premium would be a form of innovation funding, more effective when given as a market guarantee than as a cash contribution to research.

A similar approach could be adopted using ‘zero waste’ construction contracts, or the many other services which are now contracted out. Schools meals and other public catering services could specify a ‘zero waste’ component, as some have encouraged the use of local and organic produce. Cleaning companies could be required to use safe materials, thus increasing the market for non toxic products. The large vehicle contracts

given out by Government at all levels – which are being used to promote the European clean vehicle programme – could also be used to promote the kind of green leasing schemes and recyclable vehicles now being developed by Ford. All these are examples of Governments using their buying power to promote ‘zero waste’ products and services.

In pursuing such policies Governments would be acting as partners in a much wider ‘zero waste’ movement, which in the Government’s case would also extend to the way in which they minimised their waste. At the local level, the municipality are in a position to develop local materials loops internally in which it is both consumer and producer. The best example of this is compost. Municipal parks, public housing estates, public sports fields, and highways departments, all consume substantial quantities of nutrients and soil improvers. Yet their organic waste is commonly shipped to landfill. By composting at source and using testing equipment and technical advice to ensure tight quality control, they can ensure that demand creates its own supply.

Thirdly, governments can put in place incentives to encourage recycling. Most policy emphasis in Europe has been on the production side and the introduction of producer responsibility legislation as a way of increasing recycled content. But clearly the consumers need to play a part in the material cycle, and have a responsibility to do so. The main policy instrument has been user pay. If this is to avoid being an incentive to fly tipping, it needs to be introduced only when there are convenient recycling alternatives.¹⁹ But there are many other regulative/fiscal and financial incentives which can contribute to a recycling oriented regime. These include:

- requirements that retailers and manufacturers introduce returnable deposits on packaging and consumer durable waste
- encouraging domestic recycling spaces to be introduced in housing design through the planning process

¹⁹ The increase in the landfill tax in the UK has led to a diversion of trade waste into the state financed domestic stream, and to a substantial increase in illicit dumping.

- supplying domestic ‘recovery’ equipment at reduced prices through municipal purchasing schemes (this has been most common with the garden composters, but could be extended to domestic can crushers, compartmentalised kitchen waste bins, weighing scales, and wormeries)
- providing prizes for recycling (one New Zealand scheme has a weekly prize draw from the bar coded tags on recycling sacks, with large prizes conditional on good quality source separation)

All these spring from an approach to social marketing which employs many of the tools of conventional marketing directed to the goal of voluntary recycling. They do not rely on price alone. Focus groups, service convenience, simple and well designed systems, a range of alternatives to suit different circumstances, PR, community cards, competitions – all these are complements and/or substitutes to price incentives, and need to be considered as integral to a new waste incentive regime.

Finally, there are a wider spectrum of policies which encourage the new mode of consumption. I will pick out three:

(i) active ‘prosumption’ requires technical support, advice and information. An established model is the post natal support services for young mothers at home. In the environmental field, successful programmes have made use of domestic advisers on energy efficiency or the making of compost (so called ‘compost doctors’). The Green Communities programme in Canada uses their home visitors to provide advice on energy, water and waste. Advice has been provided free through Government supported local community consortia, but the householder then had to invest from their own resources, with the aid of cheap loans negotiated by the Programme from a commercial bank.

(ii) micro community facilities. Local governments can reduce the pressure for the growth of consumer durables and domestic equipment by encouraging schemes for town

wide or community sharing or leasing. There are many examples of such schemes in the transport field (from shared/rented bikes or cars, to car free housing linked to good public transport, and to the expansion of home delivery services for household goods). But there are other examples which sit between large scale, centralised provision (the town's swimming pool for example) and the micro domestic version (the multiplying private swimming pools in the back garden). There is a large gap between the two, which can be filled by the development of a whole range of neighbourhood or work-based facilities – from community pools, to local book libraries, video facilities, toy libraries, car repair workshops available for do-it-yourself mechanics, sports and leisure centres, small cyber-centres and workstations and so on. These micro centres seek to reduce the pressure in Western growth models for the domestic multiplication of many of these facilities because of the increasing inconvenience of the ever more centralised public or private versions of the service. In relation to waste, such micro community facilities are particularly relevant to village or high rise composting and recycling, and in some creative rural schemes, to the promotion of re-usable containers through the village shop.

(iii) working time. The public sector is in strong position to introduce innovative schemes to create jobs for the unemployed and increase domestic time for the employed through the redistribution of working time.²⁰ This has mostly been done as a way of preserving jobs during cut backs so that instead of making redundancies, all those with salaries over a certain level take a reduction in pay and working time. But there have been municipalities which have explored the idea as a way of creating jobs – either in the local authority itself or in firms participating in the scheme – through cutting the working hours of existing employees and transferring them to new workers. One such scheme sought to reduce the financial cost of working hours reduction by offering all those who agreed to the proposal free use of existing public facilities at off peak times (this was a way of increasing utilisation of public assets at little if any marginal real resource costs). Such a cut in working hours frees up domestic time for sustainable 'prosumption'.

²⁰ There is considerable work going on in the European Commission on working time. For a UK view see Patricia Hewitt, *About Time: the Revolution in Work and Family Life*, IPPR 1993.

Conclusion

The principle argument of this paper is that changes in the economy of materials, of which recycling forms a part, are of wide reaching economic and social significance, but that these economic and social benefits have had almost no influence in the shaping of waste policy. This is principally because waste has not until now been of any significant economic importance, and the control of waste policy has been primarily located in traditional waste and environmental ministries and municipal departments.

If the focus of waste policy is to move from alternative forms of disposal to the creation of a clean materials economy the institutional axis of waste policy will need to change. One way would be to switch responsibility for waste to industrial ministries or local and regional economic developments departments. The 'new industrial policy' would rather favour the establishment of a separate specialist economic agency, with the brief of expanding the recycling and new materials economy. Agencies of this kind have been established in many jurisdictions outside Europe, in Australasia, Japan, and many North American states. They are charged with the expansion of the supply of secondary materials on the one hand, and on the other, the expansion of reprocessing capacity, and (in a number of the cases) new uses for secondary materials.

It has been less common for these agencies to be given the brief to link their recycling mandate to social policy. In this respect the British 'social exclusion unit' provides a possible model. The unit works from the Prime Minister's Office with the authority to bring together all parts of the Government whose work has a bearing on social issues. Its ability to link priority areas of deprivation with different streams of government spending, and to use the budgetary process to ensure the targeting of these streams as part of an integrated plan, has made the unit an exemplar for joined up Government.

Connections of this kind are necessary if the potential social dividends of recycling are to be realised. Part of the Government funding of the new Agency should be linked to the promotion of recycling and associated manufacturing in areas of deprivation, to the

development of green collar jobs and skills as part of an employment programme, and to the encouragement of community enterprise in the expanding sector.

Earmarked budgeting channelled through the new recycling agency would also be a way of prompting different levels of Government to support the consumer centred initiatives to encouraging recycling, with funds available through an EU type bidding system to support the policies discussed above.

In previous periods of system wide innovation, the countries and regions which have taken the lead are those which have been able to introduce institutional innovation in a way that allows the technical innovation to flourish. In the waste sector, closely linked as it is to established structures in the state, institutional innovation of this kind presents a particular challenge. Even if municipalities retreat from incineration their alternatives are often limited by the old institutional structures of which they form a part. Where recycling and new materials innovation has made most headway is in regions where local government has changed in response to new industrial cultures, as on the West Coast of the United States. In waste as in the knowledge economy, new industry needs the new institutions of developmental state. A recognition of this institutional challenge by all levels of Government is the first step in meeting it.

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