FROM WASTE TO MATERIAL RESOURCES MANAGEMENT

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There is no factor 10 for waste.

Whatever society did to lessen the impact of 'waste' it would not improve sustainability to the level of change needed. Wastes are the outcomes of unsustainable communities. To promote the way a sustainable city would function in the future it is not enough to start with the unsustainable outcomes of today's society and try to improve the situation.

The current 'end of pipe' situation creates a mind set that positions waste as a problem. One to be treated and dealt with, an overhead, and something always there but low on the agenda because the way we deal with it generally is by old systems and technological approaches that have been developed by 'waste' companies.

In the developed world over the last 50 years waste, especially that from construction, commercial and households, i.e. the majority, has by and large been dumped into landfill. In a number of European countries notably Scandinavia, Germany, Austria, Holland incineration has been used to create energy and heat to meet specific community needs.

Substantial environmental damage was occurring as a result of emissions to water courses, to air via methane from landfill or various substances from low standards of air controls on incinerators.

In Europe, Japan, USA, and Australia at least legislatures started to tackle the issue by considering the need to move to safeguard the community and the environment by various means, especially legislation which set standards on emissions, set management practices via ISO type processes and fiscal measures such as taxation to raise the price of landfill higher than other more environmentally sound alternatives.

This led to what in Europe is called the 'waste' hierarchy which establishes and ordered list that promotes how better it is first to minimise waste, then reuse, then recycle followed by energy recovery and the last resort being landfill.

This was the worst piece of positioning that could have happened – albeit for the best reasons no doubt. What it did was create a scenario where the public only wanted their waste to be minimised. The hierarchy was paramount and no-one would talk about the latter elements of it until everything had been done at the top end.

The result has been nearly 20 years of debate about how to minimise, reuse and recycle waste with massive public opposition to 'waste' facilities to deal with the many millions of tonnes that emerge from society every day, putting immense pressure on decision makers and waste companies who found it difficult to get the day to day job done when there was a clamour for some theoretical world where there was no need for final disposal facilities at all.

At the same time developed societies were consuming more and as a result throwing more away. The majority of this was dealt with by waste companies. So despite legislation and intent the solutions delivered on the ground tended to be the lower end of the hierarchy despite a clamour to move to the upper reaches. In the middle some modest recycling started to take place and in some countries reasonable levels of material recovery has been achieved but with substantial potential for more.

I have had personal experience of working from the bottom up, trying to move up the hierarchy. It is painful. You can work on the hierarchy for municipal waste. In Hampshire county, where I had responsibility for implementing an integrated waste management system, it took ten years to achieve. However, despite attempts at influencing the reduction in volume of municipal waste, growth on average rose by 2% per annum.

There is a network of recycling centres where a lot of reuse goes on, but this may only put a delay in the system before the products enter the waste stream. I doubt if it really has a major effects on societies resource use even though it is important in behaviour terms.

Recycling has been successful with a net 30% of domestic waste material recovered. It was easy to get to 25% which was achieved in the years 1996–2000. From then to 2006 the figure has risen only another 5% points despite every one of the 600,000 households being able to recycle at least 45-50% of their waste. Despite substantial efforts and expenditure recycling has levelled off despite the best efforts, plans and commitment of all those involved.

Three energy from waste incinerators have been constructed which process 45% of the residual waste producing 35 megawatts of electricity. To achieve this has taken a long time. It was difficult and is not totally a sustainable solution. Many elements are very good but it was done for one sector only, households, and within the overall objective of 'dealing with Hampshire's household waste'.

In 1993 when we were engaging our community in what to do with their waste the overriding view was NOT to deal with domestic waste but waste from all sources.

Hampshire could not do that for a variety of reasons but the most influential was that the law had changed in the UK and local government had to let contracts to the private sector within a specific time period. It did not help matters when one of the means by which Hampshire disposed of its waste, by incineration, would not be available beyond the end of 1996 because none of the five incinerators built in the 1970's would meet new EC standards on emissions and would have to be shut with waste reverting to landfill.

Despite Hampshire receiving many accolades for delivering what is still in the UK the most integrated and successful domestic waste system we had not delivered what was really needed and what the community wanted. It was this that haunted me for some time and I did not want to be associated with the wrong answer.

In 1998, when we had managed to complete all the major decisions and legal issues to deliver what is now known as Project Integra I called my team together, many of whom had been involved in the whole difficult process of implementation and suggested that we should have a major rethink about what we should be doing, the role of local authorities, and to consider what we called a paradigm shift in our thinking.

We banned the word 'waste' from our thoughts. Our objective was to consider society's of resources. We thought that by starting at a different point we would finish with a more sustainable solution and one that would deal with materials in quite a different way.

Many of the societal issues of engaging people in waste awareness and behaviour change were mirrored in other natural resource areas such as water, energy and soil.

At this time the EC were also considering their strategies for natural resources. Many green organisations, think tanks, environmental organisations were already on this agenda and produced many well thought through papers setting out the need for change. As always there was never any mention of HOW this was to be achieved or the economic impacts but that was not their task.

Local government had to take a role in this debate. It had to listen to the advice being given and if necessary it should change it policies and its service to the community.

Most debates at this level take place at high level, EC or Governmental, and action on the ground is slow and unresponsive by both public and private sector alike. In Hampshire, with brave political

support, we decided to see what we could do locally but also by engaging with each vertical level so we were actively involved in the policy and tactical debates.

In mid 2006 we have just about developed the vision of what the paradigm shift is and HOW to make it happen. It has taken a long time but the level of complexity to make a shift from business as usual to something akin to a factor 10 shift is substantial.

Our basic premise is that we want a society that values its use of natural resources. This is clearly not a quick fix.

This paper will only focus on the use of materials but the wider agenda on resource use is available for reference on www.hnri.org.uk

The means to deliver eventually will involve science and technology but at this stage it is a people issue. People, who can lead, influence and take decisions.

To create a factor 10 change in waste requires a total rethink. The issue is about the management of materials in a market economy and not about waste at all.

Managing materials has been more prevalent in manufacturing industries where consideration is given to the type of materials used in goods, how to minimise the amount used for cost and price reasons and reject scrap is reused. There is, of course, much more that can be done even in this area and for me the major driver should be in the design departments, but the point that this example makes is that if you have a reason to do something you can easily get your mind fixed so you behave in such a way as to conserve resources.

At present the mind set is not in the total process chain and that is the challenge. Society at large needs some incentive to value its use of materials and for this to happen the process chain must become the shared goal of organisations and their supply chains and consumers alike. How to get there is the key challenge.

The situation we have is a global free market place, a very fragmented decision making logistic, compromised legislation as a result of lobbies by vested interest which slow down the process of change and the innovation required and a confused community who do not know which message to follow as there are so many conflicting ones and this is not their number one agenda priority.

On the face of it the challenge looks ominous but there are substantial grounds for optimism.

There is more general awareness of the big picture agenda of climate change and CO_2 emissions as well as energy and water management issues about the type and scarcity of supply. Demand for resolving these issues will come from grass roots. Governments will legislate. At some stage in the future there will be the tipping point which will see substantial concerted action when technological R&D in for example fuel cells, bioplastics and so on will give affordable as alternatives to current systems. Industry will be able to move fast and within a short period supply side change will happen. There will still be a problem with material recovery though unless the total system is worked out in advance because it is easier for one company to supply to millions but much more difficult for millions to supply back a range of mixed materials on a weekly basis to a few companies.

Our quest is not for the theory, not for the technology, not for the legislation, but for the means by which those principal decision makers influence new behaviours and systems throughout the process chain.

There are some excellent examples of single product producer responsibility, some retail reverse logistics which recovers packaging material, some municipal leadership within some specific material streams, e.g. biofuels in Graz, and some developing product design for recovery mainly in electronic goods which use innovation in material use and also make sense of the reuse of parts so that the product does not become a burden on the waste stream.

In London it is estimated that 650 new facilities are needed just to reprocess collected post consumer material that currently go to landfill. The total UK investment potential for new facilities runs into billions.

Investors are aware of this and are keen to lend capital. The big risk is material flow. It is pointless to build new facilities to process materials if you cannot get hold of the material to the consistent volume and quality.

Even if the price mechanism was right there are too many issues to overcome. Land use planning is the first. This is the role of local government and if they do not know what is required they will not provide for it. There is no difference between the glass bottle that is discarded from a company or from a house. It needs to go into the same collection stream but currently in the UK there are two means of collection, private and municipal. The factor 10 change is right here at the collection part of the process chain. It is here where both technological changes could be implemented using smart IT systems so that this part of the reverse logistics starts to determine what is needed further down the line when the material is prepared for market.

Current process technologies here are usually run by waste companies who employ old technology to trammel and sort materials. They operate one step away from the landfill. What is are needed are organisations who will appreciate that this material should have the status and value accorded to virgin material and that it needs greater sophistication in its handling. All the time we call it 'waste' we will treat it is a pejorative way but if we see it as an important raw material with high value we should see new entrants into the market who will bring new ideas and incentives into collection and processing.

Some new issues now present themselves. Who makes the first move and builds new facilities? Who will change behaviour?

Of the three pillars of sustainability this issue usually is given a more environmental leaning but I contest that it is the social dimension that needs the greater focus. We have the environmental understanding and we have the laws. We have an economic dimension that will influence prices soon and create change.

If we allow the economic to be the determinant for change we will see some improvement but not to the level possible. It is more likely that waste companies would put in more close to end of pipe systems to separate more materials and deliver poor quality to market.

The reason we need a different starting point is because the main measure is not the amount of waste not land filled but the need to disconnect society's use of material resources and GDP growth. Whilst the market economy starts to make its imperfect changes most of our focus should be on the neglected social pillar of sustainability.

This pillar is generally associated with health, education, well being, etc. It is about building strong, safe and vibrant communities. Most dialogue in this area focuses on subjects like HIV awareness, or empowering communities.

These are practical responses to a tangible need. Material resource use might by the same broad analysis seem to be responding to the environmental tangible need to tackle the damage done in extraction and processing.

Factor 10 change will come about when society changes its habits and does not demand or consume products and food that it does not need; when material is routinely segregated and recovered as part of a value process chain.

The socials dimension is about behaviour change. This is the X factor in factor 10 for materials use. But it is about education, because we need an informed community, manufacturers, and householders to understand what actions and decisions are needed and why.

It is about health, because there are quite a number of concerns about emissions to air and water that might affect people. There is a negative perception still about processing waste which there is not about materials.

The public will not be fooled by a simple word change. They will want to be involved and understand that system changes will not have detrimental impacts on their health especially if new technology is to be used which they do not understand.

It is about the well being of the community, because there are more jobs created, more prosperity and also the outcomes of energy recovery can benefit schools, industrial estates etc with heating and cooling.

The X factor is to describe this social dimension within a material recovery economy which results in environmental enhancement.

To achieve this does not mean throwing the marketing and communication departments at the issue. These functions have their place but before money is spent on outward facing communications strategies there is a need for collective agreement by those with the key interests to decide what is to be done. The big picture vision is required. Without it public money can be spent with little real impact.

The innovation required is to bring the key decision makers who operate at each phase in the process chain together. People who would not normally meet and would have seen no reason to do so need to appreciate that they are now quite interdependent on each others' actions.

Is this possible? It is but it will require some influential organisations to be the key movers and shakers. It can be done. At a very local level we have done this in Hampshire where the right people from the right organisations worked out how to make the type of change necessary.

Whether this can be escalated to national and pan national level is the challenge. Isolated local action cannot deliver no matter how well its intentions and networks do exist at higher levels. The issue is to interact in a different way. It is not difficult or costly. It needs some champions.

There is inevitability in new partnerships emerging of public and private sector. The role of local government is also set to change and take on a much wider dimension in local leadership of which this agenda can be one of the early priority ones.

There are a number of questions that this agenda throws up:

- Who is the ring leader?
- At what level does this role operate?
- Is the outcome a template for change?
- Is the outcome a commitment for change?

Will those organisations who have determined the way forward work together in different modes of partnership and contractual relationships to deliver different systems?

Will the community at large respond effectively to the changes in behaviour necessary?

Just by asking these questions and by not focussing on technologies themselves is a paradigm shift in thinking about the subject.

References

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