

Waste: A Green Strategy

**Submission by the
North Yorkshire Waste Action Group**

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SUMMARY

The North Yorkshire Waste Action Group (NYWAG) believes that there is now an opportunity to create an environmentally sound strategy for waste management. This would reduce the amount of waste produced and maximize re-use and recycling and treat residual waste using Mechanical Biological Treatment (MBT) and Anaerobic Digestion (AD). It would avoid incineration because due to the associated environmental and health risks and the unnecessary long term financial commitments and risks.

This strategy is consistent with the present Government's intention to adopt a "green" approach and work towards a zero waste economy (in the sense of a society where resources are fully valued – financially and environmentally – throughout the economy) are to reduce the amount of waste produced and to reuse and recycle as much as possible of that waste. All sectors of society can act to achieve these first three steps and evidence from around the world suggests that re-use and recycling can account for well over 50% of waste; indeed 50-70% are realistic targets which have already been achieved by some councils in England.

It is necessary to adopt best practice in waste reduction, re-use and recycling and to choose a cost-effective and environmentally friendly option for dealing with the residual waste. This paper discusses each of these in terms of the questions posed by DEFRA in their Waste Review, indicating that a range of measures can be taken by national and local government and by commerce and industry to achieve this goal. The role of central government should include encouraging standardisation (where appropriate) and identifying and promulgating best practice. However, we also discuss regulatory and fiscal issues and suggest policies should be modified to create a level playing field between various competing technologies and to remove perverse incentives that favour incineration and thus act against the Government's stated objectives. These include more stringent environmental monitoring requirements and modification to landfill tax to include taxing incinerator bottom ash at the full normal rate (thereby increasing costs) and removing incineration (also called "energy from waste") from the list of technologies treated as "renewables" and entitled to a Renewable Obligation Certificate. **Introducing a "gate tax" on all waste going to incineration akin to the landfill tax would help accelerate the process of phasing out incineration and replacing it with newer, greener alternatives.**

Minimizing pollution, environmental impacts and risks depends strongly on what alternative to landfill is chosen. There is no single best solution but we favour Mechanical Biological Separation (MBT)/Anaerobic Digestion (AD). AD offers environmental benefits by reducing the pollution load and producing useful product.

By contrast, incineration is a particularly bad choice. Reasons include the high costs associated with this technology coupled with the environmental risks arising from the greater number and toxicity of pollutants including creation of new ones not present in the original waste and its notably high greenhouse gas emissions. Many of the emissions are bio-accumulative and enter the human food chain, with concomitant risks to human health, with groups particularly at risk including the unborn child and children.

Any strategy must be cost-effective and place strong emphasis on waste reduction, reuse and recycling and be as environmentally friendly as possible. This approach points to a strategy that combines maximal waste reduction, reuse and recycling with technologies such as MBT/AD and avoids incineration.

Introduction

The North Yorkshire Waste Action Group (NYWAG) is a pressure group that favours a sustainable solution to waste management and believe that:

- ❖ The optimum strategy for managing Municipal Solid Waste (MSW) is to reduce the amount of waste produced, maximize re-use and recycling of wastes and treat residual waste using Mechanical Biological Treatment (MBT) and Anaerobic Digestion (AD). Such a strategy offers environmental benefits including reducing pollution as well as helping meet the UK's international obligations on greenhouse gas (GHG) emissions and the Stockholm Convention on persistent organic pollutants.
- ❖ Incineration is unacceptable for economic, environmental and health reasons. Its use presents unnecessary environmental and health risks and we feel that the precautionary principle should be applied where there is doubt over the severity of such risks. Since incineration is a capital intensive and front-end loaded technology, it also carries significant financial risks if market conditions and/or the regulatory regime change.

We believe this strategy is consistent with the views of the Coalition Government as recently set out by the DEFRA Secretary of State¹ and with the UK's sustainable development strategy². However, there have been a wide variety of approaches adopted by councils across the country in response to the need to reduce landfill as far as possible and some of these approaches are incompatible with sustainable development and a "zero-waste" economy. The need is to identify best practice and move towards it while encouraging innovation and removing disincentives to re-use and recycling.

In a recent speech entitled "*Waste – new thinking for a new economy*"¹, Secretary of State said that DEFRA is specifically charged in the Coalition Program "*with working towards a zero waste economy, encouraging people to recycle and working to reduce littering*". In addition, DEFRA will be working with the Department of Energy and Climate Change "*to send a much greater volume of our biodegradable waste through anaerobic digestion – generating renewable energy and bringing down levels of greenhouse gases from landfill*". A natural extension of this would be to avoid waste management options that are unusually bad for climate change.

Our Approach to Zero Waste

We welcome the idea of a *zero waste* economy in the sense of a society where resources are fully valued – financially and environmentally – throughout the economy. Provided health and environmental factors receive considerably more weight than in the past, *zero waste* offers a sustainable solution which requires both community responsibility (consistent with the *big society* approach) and industrial responsibility. It means genuine efforts to reduce the amount of waste produced and to reuse and recycle as much as possible of that waste.

¹ Speech at the *Futuresource* conference, Excel Centre on 15th June 2010 entitled "*Waste – new thinking for a new economy*".

² Chapter 7 of the UK Government Sustainable Development Strategy (Cm 6467) states that "*The overall objective of government policy on waste is to protect human health and the environment by producing less waste and by using it as a resource wherever possible. Through more sustainable waste management – reduction, re-use, recycling, composting and using waste as a source of energy – the Government aims to break the link between economic growth and the environmental impact of waste.*"

Disposal of MSW and, indeed, commercial wastes should meet a number of principles or policy objectives. These include:

1. Minimizing the amount of waste going to landfill
2. Reducing the amount of waste produced
3. Maximizing re-use and recycling
4. Minimizing environmental impacts. This includes pollution, including greenhouse gas (GHG) emissions and impacts on the human food chain
5. Eliminating as far as possible risks to human health, including that of vulnerable groups such as children
6. Offering a cost-effective waste management solution.

Meeting these principles and approaching zero waste requires steps that are practical, cost-effective and politically acceptable. These steps can be summarized as:

1. Source Separation
2. Door-to-door Collection
3. Composting
4. Recycling
5. Re-use, repair & deconstruction
6. Waste reduction initiatives
7. Economic incentives
8. Residual Separation and Research
9. Industrial responsibility
10. Interim landfill for the stabilized “dirty” organic fraction.

Some of this is happening already but approaches to waste management vary widely among local authorities and others and this means that examples of good practice co-exist with poor or mediocre practice. The trick is therefore to identify and build on good practice while recognizing that there is significant risk that a number of local authorities will take retrograde measures that are contrary to achieving good waste management. We must recognize that a coherent national strategy with commitment to it from all parties is needed – national and local government have a role and it makes no sense for a local authority to formulate plans that are inconsistent with national government strategy.

The zero waste approach requires widespread acceptance in society for it to work. This means incentivizing people and making it easy for individuals and companies to play their part; it probably also means avoiding penalties that build resentment. However, there will inevitably be tensions between different policy aims and these are implicitly revealed in some of the general questions that DEFRA are asking. Thus:

- Maximizing “*the contribution waste management in England makes to the economy*” and, at the same time, “*our environmental and energy goals*” are only compatible with some but not all waste management approaches. In general, re-use and recycling mean that resources are conserved and the energy required to

process virgin materials and the waste produced in such processing is avoided. Similarly, anaerobic digestion both produces energy in a clean manner and can produce useful product. Both are sound approaches for reducing greenhouse gas (GHG) emissions. By contrast, incineration (often called “Energy from Waste” and other euphemisms) reduces incentive to recycle, destroys materials and products that could otherwise be recycled with concomitant need to exploit virgin resources, and carries health and environmental risks.

- While it seems attractive for *Government to make the best use of the skills and knowledge of the private sector*, there may be tensions between the inevitable self-interest of firms motivated by profit and the democratic wishes *of local communities* and hence *civil society*. Given that moving towards the delivery of a zero waste economy requires public acceptance, it is crucial that local authorities use waste management consultants guided by strong “green” central government policies in arriving at their waste strategies. Only when this has been carried out with full public consultation should waste management firms be brought in. In other words, there has to be a separation of responsibility between those who design the strategy and those who implement it.
- DEFRA ask whether local authorities have the right *responsibilities for waste services*. Whether or not they do, our experience suggests that they may have insufficient knowledge to design a viable and cost-effective strategy that meets the needs of local communities. At a time when waste management is moving away from a landfill-based strategy, this can make them over-reliant on private sector advice but without the experience to act effectively as informed customers. There is also a democratic deficit in that small local councils such as parish councils can object strongly to major developments in their area but have no effective say in whether or not it goes ahead. This needs remedying, giving a much stronger say to smaller councils and the local population.
- It is clearly desirable for *illegal waste activity be minimized*, and for reduced *levels of fly-tipping*. So far as domestic waste is concerned, much of the answer is to make legal disposal of waste as convenient as possible, with an increase in the number of recycling facilities and disposal points for non-recyclable waste. Without an incentive for illegal disposal, why do it? More generally, economic incentives to encourage householders, commercial undertakings and local authorities to adopt good practice are probably more effective than sanctions and less likely to build resentment. However, there have to be sanctions for breaches of waste regulation, especially where they involve hazardous material but we are not in a position to comment on fairness or proportionality.

The final DEFRA question seeks comment on the balance of regulation between ensuring that we protect health and the environment and unnecessarily burdening businesses and local authorities. In our view, this depends on strong guidance to ensure that a “green” approach is taken, especially in dealing with the latter stages of the waste hierarchy. We feel that the precautionary principle should be applied whenever there is doubt concerning environmental and/or health risks, especially in cases where alternative technologies do not present those risks. This means that while there may be some opportunities to reduce or remove regulations, this must be balanced by stronger regulations in some areas, as set out below. In addition, a limited number of fiscal changes could be more effective than regulation in achieving a “green” strategy.

Waste Prevention

We agree that waste prevention (taking measures to reduce the quantity of waste generated) must be the first step in any waste management strategy. There are a number of ways of producing less waste including encouraging re-use of goods. However, this requires action across society, including government and commercial producers and retailers. One key is to find a way to use community responsibility at the back end to drive industrial responsibility at the front end. We seek to address the questions DEFRA pose by looking at waste streams from a variety of sources, while recognizing that these are interlinked.

☒ *What roles should (i) national and local government; (ii) businesses; (iii) voluntary organisations; and (iv) individuals take in order to prevent waste from arising and to reduce the hazardousness or environmental impact of waste?*

❖ Individuals can reduce waste by:

- Composting waste in the garden is ecologically sound and using an enclosed composter to reduce the risk of rats. Some councils subsidize or give composters while others collect green waste. A combination of these approaches is probably the optimum.
- Reduce overbuying food³. In the UK we throw away roughly 1/3 of everything we buy; over 80% is avoidable waste but is thrown away whole, untouched or unopened – some 340,000 tonnes is still in date and some 1.2 million tonnes is simply left on our plates¹. Much of this currently goes to landfill. Retailers may inadvertently encourage this but there is also individual responsibility. An obvious step would be to reduce the prevalence of “buy one get one free” offers (perhaps replacing them with half price offers) but commercial reality means that some way of encouraging such a move needs to be found.
- Re-using goods: charity shops help in ensuring that some types of goods are re-used while charities and auctioneers play a role in re-using furniture. In other areas (e.g. cars and some electrical goods) there is a trade in second-hand goods. Both commercial and charity organisations have an important role and this could be reinforced in some areas (e.g. electrical goods) by better design and reparability (see below)

❖ Reducing waste induced by commerce:

- Junk mail – much is simply thrown out or burnt. Tighter regulation of unsolicited mail and a levy on distribution of such mail through commercial providers may be part of the answer.
- Excessive packaging and non-recyclable packaging undermines householders’ efforts to recycle more and adds to council tax bills⁴. While supermarkets are beginning to address this issue in

³ The Waste and Resources Action Programme (WRAP) estimate the amount of food we throw away increases by 80% around Christmas
Source: <http://www.telegraph.co.uk/finance/personalfinance/consumertips/3472948/Cut-your-festive-food-bills.html>

⁴ The Local Government Association’s third survey of food packaging found that in a typical basket of shopping almost 40% of supermarket food packaging cannot be easily recycled. A survey by the British Market Research Bureau (BMRB) looked at eight supermarkets and the weight of food packaging they use in a typical shopping basket found considerable variation between supermarkets.

response to consumersⁱⁱ, there is adverse media comment⁵ and any official action that encourages this would be welcome. One approach would be to build on the voluntary Courtauld Commitment under the aegis of the government-funded Waste & Resources Action Program (WRAP). Rapidly increased use of biodegradables in packaging and other products should further reduce waste at the front end.

- Free plastic bags can do significant environmental damage. Some 9.9 billion were distributed in the UK in 2008, about 18% of total plastic waste or 3.24% of domestic rubbishⁱⁱⁱ. Few supermarkets have gone beyond offering re-usable bags for sale, perhaps coupled with incentives such as additional reward card points for re-using bags. Further reductions probably depends on charging for plastic bags – the Irish Government put a 15 cent tax on plastic shopping bags and reduced use by 92% in one just year^{iv}. A similar move in the UK should be a priority as it is a simple action that addresses preventable waste while simultaneously contributing to the Exchequer.
 - In Italy several supermarket chains are providing dispensers which allow customers to refill shampoo and detergent bottles as well as wine, water and milk. This shows that other Western societies have been prepared to adopt solutions that are not widely seen in the UK. It should be “win-win” as it presumably reduces costs both to the supplier and the consumer.
- ❖ Waste by Industry; industry could cut waste by better design
- Products and packaging should be designed to further reduce consumption of materials, energy and water and maximize recyclability. The latter may involve some standardization to increase the use of recyclable materials and reduce use of non-recyclable plastics. This must be coupled with clear labeling of what is and is not recyclable to reduce the amount that enters the general municipal waste stream rather than a recycling stream.
 - Electrical goods could be designed to last longer with low-cost repair and maintenance offsetting higher initial cost. However, this may require changes in attitudes and tighter regulations. A company selling an item of electronic equipment is now (2009) legally bound to take your old one in return. Making disposal easy in this way should reduce the amount of illegal dumping of fridges etc. Unfortunately, it does not deter built-in obsolescence or the wasteful demands of changing fashion. One way forward could be through better (and cheaper) repairability and enforcing longer guarantees (e.g. 5+ years in place of the current maximum of around 3 years).
 - Extended Product Responsibility (where firms take physical and financial responsibility for products even after they are sold, collecting their products and packaging after use) encourages firms not to produce non-recyclable and non-reusable products. It has been applied to packaging, tyres, and electronics^v.
 - Measures such as returnable bottles (with a deposit on the bottle) would prevent waste and enhance re-use. In Ontario (Canada) the beer industry has used refillable glass bottles for 50 years

⁵ An example is the *Daily Mail* story on 17th September 2010 concerning excess packaging by supermarkets entitled “It's war on store waste: Landmark case will force supermarkets to end needless packaging” <http://www.dailymail.co.uk/news/article-1312599/Sainsburys-landmark-case-force-supermarkets-end-needless-packaging.html#ixzz0zmmqAdJo>

and achieve 98% recovered so each bottle reused 18 times, saving the company money and creating jobs in collection and cleaning. However, targets need to be well thought through if they are not to be counter-productive^{6,7}.

- Responsibility Deals are concerned with business waste which lies outside our experience. However, we note the success of the Courtauld Commitment and building on this model offers a positive way forward.

☒ *Which waste streams or materials should be a priority for waste prevention?* There are probably two priorities; those where prevention is relatively easy to achieve and those where toxic or hazardous materials are involved. The timescales for achieving these priorities are likely to differ. DEFRA's recent consultation document identifies a number of target waste streams and the above measures would help facilitate reductions in some of them. In the longer run this would make bans or major reductions easier to implement.

☒ *How should waste prevention be measured?* In some cases this is simple, for example counting the number of free plastic bags issued before and after introducing a charge. However, assessing waste not produced is more complex where simple counting or weighing is not appropriate. Metrics such as reduced volume of toxic materials in a product may be useful. Responsibility deals may include formulating appropriate metrics for a sector of business; the key here is standard metrics that everyone can agree to use across a sector and this may depend on the objectives set out in the responsibility deal.

Preparing for Re-use

Re-use prevents or postpones waste and avoids exploiting virgin resources. Important facets are repair and deconstruction whereby products or components of products that have become waste are prepared for re-use. Where there are sufficient economic incentives, re-use will happen, though there may be a case for an initial subsidy in new areas (akin to the Renewable Energy Obligation in concept). In some electrical goods, better future-proofing of design could help in extending the life, as could longer availability of spares for both electrical and mechanical goods. There are significant financial incentives and opportunities for employment – for example, Urban Ore in Berkeley, California, a 30 year-old company, employ 27 people in well paid jobs and grosses \$3 million per year^{iv}.

Which waste streams or products are priorities for reuse? This must include extending present practice in both the commercial and charity sectors. Clothes, books, videos, household goods and old electrical goods and furniture are cited above, while second-hand vehicles are so common no-one remarks on their presence. New areas will emerge but we are not in a position to offer any comment on this. Since *existing barriers to preparing more waste for reuse from the household waste stream* includes a number of social factors (e.g. fashion or preference for the new in some areas) change in attitudes may be slow in some cases.

⁶ For example, packing bananas in modified-atmosphere bags extends shelf life and reduces the number discarded by retailers after customers have broken up bunches. Other examples are potatoes, grapes and salad leaves, while wrapping extends cucumber shelf life beyond the three days to 14 days. - Sunday Times Magazine, 0/2/09.

⁷ The Industry Council for Packaging and the Environment believe that reducing weight of packaging may not always be the best option and that manufacturing and retailers may have the knowledge to best minimize expenditure of resources (e.g. recycled paper packaging is weaker so needs to be thicker and heavier).

More generally, waste should be seen as a resource, whether through re-use or recycling. For example, an increase in the value of mineral resources appears inevitable given that demand for these resources continues to increase markedly, driven by the demands of the new super economies. It is reasonable to anticipate that this will help to fuel demand for real 'recovery' and more recycling in the near future. We believe that local authorities should be looking to capitalise on these resources not destroying them forever through incineration. Not only will this approach stimulate local business development but it will also create far more jobs than the paltry few generated by capital-intensive incinerators. In 1995 Nova Scotia rejected an incinerator proposal that would have created less than 100 jobs, and in the next five years pursuing an alternative plan, along the lines discussed above, created 1000 jobs in the handling and treatment of the collected materials and another 2000 jobs in the industries using these secondary materials.^{vi}

Recycling

Recycling (converting used materials into new products) requires contributions from all sectors of society and local authorities have a major role in either facilitating or blocking this. Evidence from around the world suggests that re-use and recycling can account for well over 50% of waste; indeed 50-70% are realistic targets. In the UK South Oxfordshire District Council has recently achieved 70% after only one year of a new scheme^{vii}, while rates over 70% have been achieved elsewhere⁸ and rates of over 50-70% are common. We now have large cities like San Francisco (population 850,000) achieving 75% diversion from landfill without incineration (with a goal of Zero Waste by 2020) and smaller communities in Italy and Spain achieving over 80% diversion. As WRAP reports "*recycling offers more environmental benefits and lower environmental impacts than other waste management options*"^{viii}. Moreover, DEFRA has admitted that "*In terms of recycling, England is still very much the poor relation among its European partners, with countries like Austria and Belgium recycling more than 50% of their waste*"^{ix}.

Some 46% of municipal waste consists of paper, cardboard, fabrics, glass and metals, much of which could be recycled. Materials such as glass and metal are infinitely recyclable, though others can present difficulties. Materials like paper and textiles can go through recycling a limited number of times; recycling paper is limited by fibres becoming too short to pulp while recycled textiles are used in applications like underlay and car acoustic materials. Paper and cellulosic and natural textiles (though not polyester) can then be anaerobically digested.

Plastics can be difficult since not all plastics are recyclable (leading to public confusion over what can be recycled) and many are chlorinated⁹. Standardizing the use of plastics and reducing the number of plastics used could help and facilitate sorting and recovery. This could include regulatory changes relating to standardization of the plastics used in food packaging to ensure that recycling is maximized and further restrictions on the landfill of biodegradable and recyclable wastes

⁸ Examples are Zabbaleen-served areas of Cairo, Egypt (85%), Opotiki District, New Zealand (85%), Gazzo (Padua), Italy (81%), Trenton, Ontario (75%), Bellusco (Milan), Italy (73%) Netherlands (72%).

⁹ The British Society for Ecological Medicine (BSEM) argues that incineration is a poor answer to these issues as many plastics are organochlorines and form toxic products, notably dioxins, when burnt. In addition an important resource is wasted. We use about 3-4% of our oil to produce these plastics and it makes no sense to simply burn them. BSEM suggest that the best solution would be to stop making chlorinated plastics in the first place in view of their persistence and toxicity. Instead we could make biodegradable plastics (but note these will break down to form the powerful greenhouse gas methane).

There is a need to identify good practice and learn from councils that adopt it. Central Government could have a role to play through such measures as setting high national standards for the collection and processing of household waste (collection of clean and sorted household waste is the only way to ensure quality and maximise value) and introducing fiscal incentives to encourage reuse and recycling and manufacturers to use secondary rather than virgin materials.

☒ *What should the role and nature of local authority waste management collection and disposal services be?*

Local authorities should embrace the full range of waste reduction initiatives, source separation, composting, reuse, repair and recycling as well as being responsible for handling of the inevitable residuals (leftovers) from these activities. There is inevitably controversy over handling of residuals; especially the use of incineration with its environmental and health risks.

Ideally all councils should adopt best practice, giving a national high standard for re-use and recycling but the reality is very different. Currently there is wide variation between councils; some sort between recyclable and non-recyclable waste, others sort into five waste streams with the laggards just making a single unsorted collection. Some collect glass, some don't and the same applies to aluminium foil. Some are equipped to handle the full range of theoretically recyclable plastics while many don't even try. Then there are problems with contamination by other rubbish so plastics and glass fail to get recycled. All this means there are missed opportunities for re-use and recycling.

There is a confusing array of approaches across the UK and this can only discourage recycling. And there seems to be no good reason why regional differences have to be so marked. Why, for example do some areas ask that you put your recycling out in boxes; in another, bins; in another, plastic bags and in yet others a mixture of different types of container. Even more confusingly, coloured bins mean different things in different areas. The *Sunday Times* reports that some councils have as many as seven containers and notes that the Germans (who they say, are five years ahead of us, are back down to three^x.

This lack of standardisation arises because municipal waste disposal is organised locally in Britain. The theory is presumably that the advantage of councils with different facilities and geography being able to can organize themselves more effectively to meet local circumstances; for example, the *Sunday Times* suggests that suburban councils would do more recycling, rural ones more composting and urban councils more incineration. In practice, this is not how it turns out and there is ample opportunity for councils to adopt bad practice (we include incineration in this, even where the heat is used to generate electricity and then used in CHP). There is therefore a strong need for standardization and the avoidance of bad practice. As we shall see later, this also means that Government must level the playing field between various technologies and remove perverse incentives to give newer technologies for managing the residuals a fair chance.

☒ *How can individuals, businesses and communities best be motivated to recycle more?* Financial incentives and convenience are significant factors. Landfill tax is presumably intended to encourage re-use and recycling while discouraging landfill but there is currently a major flaw in the system – incinerator bottom ash (IBA) pays only a low rate of landfill tax despite the environmental hazards associated with it. There is an urgent need to remedy this and apply the full standard rate to IBA. Failure to do so will mean that incineration continues to be subsidized at the expense of approaches that enhance re-use and recycling.

Individuals, and hence the communities they live in, will recycle more if it is easy and convenient for them to do so. This means regular collections of the main recyclables using a standardized set of bins (see above), though not necessarily of the same size for all dwellings. This should be coupled with convenient local recycling centres; there is a role for collection of some items at larger supermarkets and this should include things like plastics and glass, some of which results from the products they sell.. In some areas this implies a need for more such centres.

Finally, confusion over what is and is not recyclable needs to be addressed through clear labeling, using both words and symbols.

☒ *How does the choice, including frequency, of collection service impact on the quantity and quality of waste fit for recycling?* The greater the variety of items regularly collected, the more likely you are to collect them. For example, if plastics are not collected at the doorstep then it is much less likely that they will be collected in any great quantity via other means. Quality may also be affected by lack of, or poorly understood labeling, particularly for plastics.

While collection at source for a range of household waste materials ensures good quality waste, there will always be some of these potentially recyclable wastes put into general waste streams. These wastes are recoverable using, for example, Mechanical Biological Treatment (MBT) – a combination of mechanical sorting systems and Anaerobic Digestion) to process residual mixed municipal waste. MBT is being used by some local authorities but by no means all. We believe that MBT or a technology equally well able to sort waste all (i.e. the best available technology) should become the norm within a few years.

Thus maximising, recycling needs both optimal separation and collection of recyclable material at source (to give relatively pure waste streams) and through mechanical separation (e.g. in an MBT facility).

☒ *Should greater emphasis be placed on using recyclable/recycled materials in manufacturing and production and, if so, how should this be achieved?* The answer has to be yes if we are to move towards a “zero waste” economy. Using more recyclable materials should enhance recycling rates.

Instead of destroying the residuals, it is desirable to research into Residual Separation and Zero Waste. Such research would both monitor the success (or otherwise) of the citizens’ efforts at waste reduction and re-utilization and would provide a feedback mechanism to industry for better design of packaging and products. It would ultimately enhance moving towards sustainability.

By contrast, an incinerator acts as a disincentive to recycle since once it is built it has to be fed; ensuring high throughput is an economic imperative for the operators since they must service the sunk costs over a long period. Already the UK is exporting some MSW to incineration plants in northern Europe, where there is 3m tons of overcapacity. This might enable countries like the Netherlands to combine reasonably high rates of recycling with incineration, but only because they have the import option for “feeding the beast”. The UK will not have this option if anything like the proposed number of incinerators is built, locking this country into a strategy that starves recycling industries of raw materials and prevents a cheaper, greener business model from succeeding.

Energy recovery

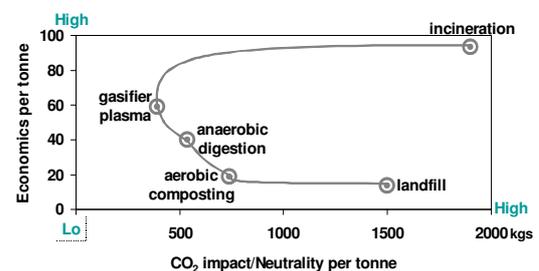
The DEFRA Call for Evidence suggests that energy recovery is about extracting, through various technologies, energy from the waste left once as much as possible has been prevented, reused and recycled. It suggests that Energy from Waste (EfW) covers a range of established technologies including combustion and anaerobic digestion, as well as emerging technologies such as advanced gasification and pyrolysis. We believe that this is technically correct but at variance with the nomenclature that is used – bluntly, Energy from Waste is all too often used as a misleading synonym for incineration. This PR arises because incineration is unpopular, as witnessed by the fact that national and many local pressure groups exist to oppose the use of this technology.

If EfW is taken to have its literal meaning, then we welcome the Government’s commitment to “*delivering a huge increase in EfW through anaerobic digestion*”. On the other hand, we are strongly opposed to incineration for financial (there are cheaper alternatives), health and environmental reasons and because it destroys usable resources.

We believe that handling the residuals left after waste reduction, re-use and recycling should be done in an environmentally beneficial manner that meets the UK’s international obligations on the environment. For this reason, it is worth comparing the environmental issues surrounding different technical approaches prior to addressing the questions that DEFRA ask. Thus:

- ❖ No technology avoids GHG emissions altogether *but landfill and incineration are the worst technologies for greenhouse gas emissions*. Figure 1 (from a recent presentation by Peter Jones OBE¹⁰) shows the relationship between cost and CO₂ emissions for a number of waste management technologies. Incineration is both most damaging and most expensive. As Peter Jones has said “*All incineration processes will raise CO₂ emissions and should therefore be minimized as part of any successful strategy in managing the waste resource*”.
- ❖ By contrast Anaerobic Digestion (AD) also helps reduce GHG emissions by displacing industrially-produced chemical fertilizers and, where smaller, local facilities are used by reducing vehicle movements and by reducing electrical grid transportation losses.
- ❖ Minimizing pollution, environmental impacts and health risks depends strongly on what alternative to landfill is chosen. Thus AD can be beneficial but incineration is particularly bad due to the greater number and toxicity of pollutants, including creating new ones not present in the original waste. Combustion, especially high temperature combustion as in an incinerator, leads to emissions that risk health, making it prudent to choose an alternative technology.

Figure 1
Relationship between cost and CO₂ emissions



Note: Process emissions before net off energy

¹⁰ Peter Jones OBE is a former BIFFA Technical Director and is an Independent Advisor to Boris Johnson on the London Waste Board.

- ❖ The high capital costs of incinerators means that they rely on a high load factor and this tends to discourage reuse and recycling. Incineration reduces our ability to reuse or recycle potentially valuable discarded material. Waste PFI contracts that include incineration depress recycling rates. This can mean that operators see it as more profitable to fall short of recycling targets, effectively capping recycling rates.

These considerations points to a strategy that combines maximal waste reduction, reuse and recycling with technologies such as MBT/AD and avoids incineration. Reasons for this preference include:

- Using the methane and power produced in AD facilities can replace energy derived from fossil fuels, thereby reducing GHG emissions - the carbon in biodegradable material is part of the natural carbon cycle so CO₂ released to the atmosphere from AD has been removed by plants in order for them to grow in the recent past. In particular, food plants are re-grown, so that part of the system is carbon neutral. Indeed MBT/AD is one of the best options for low GHG emissions.
- Digester liquor can be used as a fertilizer supplying vital nutrients to soils, replacing chemical fertilizers which require large amounts of energy to produce and transport. The solid, fibrous component of the digested material can be used as a soil conditioner to increase the organic content of soils.

☒ *What are the barriers to delivering an increase in EfW capacity, including a huge increase in generation from anaerobic digestion? How might these be addressed?*

Answering this question means first addressing the perverse incentives that exist in the waste field which make local authorities act against the declared Government policy for more AD plant. The *Sunday Times* (*op cit*) has explained that councils have sought a long-term alternative to landfill and were attracted by the PFI as a procurement method which secures private funding for public investments, including waste projects. However, bankers were only prepared to lend the large amounts of money involved in return for a very low risk. They believed that only incinerators offered such low risks. This means that there is a danger that decisions by local authorities will lock us in for 25-years to a strategy based on incineration, contrary to the government's stated policies.

Even though toxic emissions from incineration plants are less than in earlier plant because of hotter, better designed burners, extensive pollution control equipment is still needed and emissions and the concomitant environmental and health risks still exist, though at a lower level than with earlier designs. Even setting aside the high costs associated with incineration, there is another reason for opposing incineration: it starves recycling industries of raw materials and prevents a cheaper, greener business model from succeeding (see above).

We agree with the conclusion of the 29th August Sunday Times article that “*incineration should be the last resort, not the first*”. However, specific Government actions are needed to address the paradox that incineration is acting as a barrier to the Government's stated policies of increasing AD. We believe that these measures should include:

- ❖ Changes to the Landfill tax to ensure a level playing field for different waste management technologies: this means charging the standard rate for incinerator bottom ash, not a very reduced rate (as now);
- ❖ Renewable Obligation Certificates (ROCs) subsidize electricity from renewable sources to help reduce greenhouse gas emissions. However, incineration has the highest greenhouse gas emissions from any waste management technology (and comparable to fossil fuel powered plant) so the entitlement to ROCs should be removed.

- ❖ More stringent independent monitoring of emissions from incineration (with the polluter paying) and assessment of Incinerator Bottom Ash for ecotoxic pollutants, possibly through independent monitoring with the cost met by the incinerator operator.
- ❖ Review PFI funding for waste. We understand that prospective PFI funding for waste amounts to some £2 billion and that most of this is accounted for by incinerators including those going under various guises such as “Energy from Waste”. Given that the alternatives such as AD have markedly lower capital costs and that reuse and recycling creates many more jobs, eliminating PFI for incinerators really is “win-win”. It is a win for the taxpayer since replacing incineration with other and cheaper technologies (in particular AD) could save around half (say) of the PFI money, perhaps a billion pounds from public debt. It is a win for the ratepayer who would no longer be faced with the extra rates associated with this most expensive of disposal technologies. It is also a win for employment, hence saving the taxpayer money on unemployment benefits, and it is, of course, a major victory for the environment.
- ❖ Introduce a “gate tax” on all waste going to incineration akin to the present landfill tax. Its aim would be to tip the balance in favour of newer, greener alternatives including not only re-use and recycling but also AD. Such a tax should increase year on year in the same way as landfill tax, following a similar upward path. It would help accelerate the process of phasing out incineration which we see as highly desirable.

☒ *What role should Government, industry and voluntary groups play in communicating the benefits of EfW to local communities?* For the individual, benefits are only real if they benefit financially and some solutions actually increase costs and offer no benefit to the council tax payer. Voluntary groups will make their own minds up on whether or not to extol the benefits of particular types of EfW plant and it should be obvious that many are not going to support incineration. Such opposition would not appear likely for well-designed and run AD facilities.

☒ *How can Government best support local government in the development of waste management plans that include EfW facilities?* We must distinguish between incineration and other forms of EfW. The best way that the Government can support an enhanced role for AD is by removing the perverse incentives that favour incineration. This includes the measures outlined in the first question. In addition, an immediate decision to remove PFI support for incineration projects would save the taxpayer a significant amount of money (and encourage cheaper solutions) and help phase out this technology from the UK. It should advise local authorities to include break clauses in incineration contracts (say every five years) so that they periodically have the opportunity to get out of commitments they no longer see as sensible. Similarly, local authorities should be advised to avoid any element of “take or pay” so that the market risk falls on the operator, not the public purse.

☒ *What steps can be taken to encourage community ownership of EfW facilities?* The local authority might own them and in that sense stand proxy for the community. However, we are not in a position to view this as a good thing since there is a possibility of the community owning incineration plant which we do not wish to see.

Disposal

We agree that disposal should now be seen as the last resort for many types of waste. However, there are essentially three disposal options and we think that all three should be evaluated. The options are

- Disposal of waste at sea, which can be environmentally damaging and pose a threat to marine life if it is not properly controlled. While it is regulated in the UK,^{xi} we suggest that it should be minimized in parallel with efforts to minimize landfill; it should not be regarded as a substitute for landfill. Moreover, potentially hazardous materials such as incinerator bottom ash should not be disposed of at sea; if it is not already regarded as industrial waste under the Food and Environment Protection Act 1985 (and therefore banned from disposal at sea) then it should be.
- Disposal to the atmosphere (air). We have a finite atmosphere and the various Clean Air Acts recognized this fact. Building on this, other environmental legislation has recognized the damage that atmospheric pollution can cause. In addition, climate change has led to international agreements and concomitant UK efforts to reduce greenhouse gas emissions. Against this background, it is prudent to minimize emissions that risk damage to the environment or to human health. Incineration is essentially a route for disposal to the atmosphere (though about 30% of waste remains as ash) and therefore destroys resources and acts as an unnecessary source of pollution that carries both environmental and health risks. Moreover, it is uniquely bad among waste disposal options other than landfill in its greenhouse gas emissions. In consequence, we believe that it should be phased out as quickly as possible and that as a first step the perverse incentives referred to above should be removed and no support given under PFI.
- Disposal to the land (landfill). Alternatives to landfill for MSW are often viewed as having a positive effect on global warming by reducing the amount of biodegradable waste going to landfill. Methane is generated at all landfill sites accepting MSW but this problem can be addressed. Currently, CO₂ and methane emissions make up over 98% of GHG emissions from waste management which contributes about 3% to total GHG emissions in the UK, largely made up of methane emissions from organic waste degrading in landfill^{xiii}. However, this methane can be, but in the UK often is not, captured and burnt to produce energy or converted to produce biofuels, markedly reducing GHG emissions. From a climate change standpoint, methane capture is important and should be encouraged.

☒ *How best to further reduce the amount of waste going to landfill? Any strategy must place strong emphasis on waste reduction, reuse and recycling. This approach points to a strategy that combines maximal waste reduction, reuse and recycling with technologies such as MBT/AD and avoids incineration.*

For municipal waste, local authorities should be given binding targets for re-use and recycling and we believe that such targets can realistically be upwards of 70% within a short time, probably less than two years. Financial penalties to encourage this could include a more rapid rise in landfill tax than is already envisaged **coupled with a new “gate tax” on all waste going for incineration.**

☒ *What are the types of waste where a continuation of landfill might be acceptable? We presume that landfill sites that deal with hazardous waste and special cases such as facilities for dealing with nuclear waste will have to continue. Other than that, a zero waste economy is in principle incompatible in with waste going to landfill (or being incinerated). Therefore disposal must be regarded as the last resort. This is why we favour research into improving our ability to divert waste from disposal routes coupled with interim landfill for the stabilized “dirty” organic fraction.*

☐ *When should we aim to be as close to zero waste to landfill as possible?* This final question is impossible to answer since our ability to reduce the amount of waste needing disposal should improve over time. Thus short term realistic targets could look to, say, 70% diversion from landfill or incineration with higher aspirational targets being set for the next decade and beyond.

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