

Consultation on petition P-04-341 Waste and Incineration
Response from David Roman

Prosiect Gwyrdd Consultation

In response to the National Assembly Petitions Committee consultation on Prosiect Gwyrdd these are my views as a professional with extensive experience of recycling systems, including at international level, but also as a resident of the area:

The Wales waste strategy has goals for reducing, recycling, composting and recovering energy from discarded materials using a sophisticated evidence base of not just what is necessary but what is achievable. The incineration of residual waste – a mixture of materials assumed to be outside the scope of recycling and composting services – is presented as a complementary technology which is better than landfill. In the form proposed for Prosiect Gwyrdd it detracts from more resource efficient processes and commits to an expensive, unpopular approach that is already outdated and will become more so over the course of the generation the project spans.

Local authorities and contractors in Wales have demonstrated that they are capable of high recycling and composting performance, but have a lot of room for improvement even when compared with other European nations in 2011, let alone in future years as resource and energy use become more pressing issues. Many local authorities in Wales have introduced changes to collection services and materials destinations in an ad-hoc fashion at a level that will meet statutory targets with minimal disruption to existing structures or arrangements. With the benefit of high recycling performance in many areas and a long term strategy they could now make informed decisions which pool knowledge and management capacity (as well as possibly resources, though this is not as important), while retaining flexibility and optimising market opportunities as they arise. The Prosiect Gwyrdd proposal however takes a lot of options away and requires only the delivery of consistent tonnages of mixed high-calorific

material to a single point. There is nothing wrong with incineration per se, but the materials mix, tonnages and alternative uses will undoubtedly change over time and there is already every reason to predict that an incinerator of this size will represent at very least a huge missed opportunity for local economies.

There will be a need for treatment and disposal of residual waste at least in the medium term. The best fit in the circumstances is a relatively low capital investment – mechanical biological treatment (MBT) – that can adapt to the flow of materials rather than try to dictate it, and has the potential to separate any remaining recyclable or compostable materials and to ensure that unusable outputs do not pose an environmental or health threat. The incinerator proposed requires initial expenditure of over £1 billion and a consistent tonnage of a particular type, but does not propose to sort or even screen the inputs and therefore can make no guarantees about outputs. The materials most useful as feedstock for incinerators – plastic and paper – have high potential for recycling and include some substances believed to be harmful to human health when present in incinerator emissions. The substances that will also be fed into the incinerator and could leave as airborne particulate are in truth unknown and therefore pose an unacceptable risk to local populations.

The petition calls for review of three policy areas:

1. Councils to be allowed a choice in their waste technology and procurement. Whilst giving a choice to councils right now, I would agree that Prosiect Gwyrdd greatly restricts future choices. I do not believe that any decision needs to be made at a more local level however, as the implications will be felt across a wide area.
2. Residents to be given more choice on waste disposal. The options considered do not reflect those available and I agree that they should be presented with reference to best practice elsewhere and with no false assurances about future waste composition.
3. Recyclable waste to be banned from incineration by 2020. This approach is a typical legislative technique to underpin market development in recycling, but in this context is too crude – there are circumstances in which incineration is environmentally and economically preferable to recycling or landfill – and would suggest fiscal measures instead, eg an Incineration Tax along the lines of the Landfill Tax.

Attached are my answers to the questions put in the Petitions Committee letter with explanatory notes. I am willing to provide evidence in person if required.

David Roman

Question 1

What, in your view, is the best method of disposing of non-recyclable waste?

This is a good question but in the case of Prosiect Gwyrdd rests on the flawed assumption that over 30% of municipal waste is not recyclable. The Assembly has already established through its own evidence base for its waste strategy that the best environmental option for most waste materials is recycling or composting. There are very few materials that have no potential for either – high recycling systems elsewhere indicate that most barriers can be overcome with an effective mix of market development and legislative/fiscal policy. Most of the very small amount of truly unavoidable, truly non-recyclable waste arising during the lifetime of the proposed project will have a low calorific value and/or high moisture content, and would be best stabilised and sent to landfill. MBT (Mechanical Biological Treatment) can derive some value from this residual material and reduce hazards from decomposition or any leachate or emissions.

The 2010 Environmental Life Cycle Assessment report by the Environment Agency Wales examines four scenarios using the WRATE modeling tool - 100% recycling, 100% energy recovery, 70/30 and As Is - for each 'priority material'. It gives LCA (Life Cycle Analysis) based on GHG (Greenhouse Gas) emissions over 100 years and abiotic (inorganic) resource depletion as well as freshwater aquatic ecotoxicity and human toxicity. It makes a distinction between biogenic and anthropogenic carbon emissions, the difference between releasing carbon which is cycled through photosynthesis and therefore considered natural and sustainable, and releasing fossil carbon which can not be captured sustainably.

In only looking at the 100 years emissions it does miss the point that methane is about three times more potent on a 20 year timescale than it is on 100 years, it peaks in the short term and therefore has more weight on the tipping point timescale than CO₂. The report also makes a comparison on energy generation as is, recycling starts to look more attractive as renewables (true renewables) increase in the mix of energy sources.

The report's findings are that paper and wood should be incinerated, food should be sent for anaerobic digestion, while plastics, metals, glass and textiles should be recycled. Metals in incineration produce low grade alloys, so environmentally not only is it pointless feeding them into incinerators, it degrades them. Green waste basically gives no meaningful result, because it is biogenic and therefore WRATE does not accept that green waste composting is anything outside natural cycles, it is the baseline, so bizarrely burning it gives a positive energy impact, but even the report authors point out that this a nonsense. They do not concede the same re paper incineration though the report mentions WRAP and others disagreeing with this point

because they use different parameters and assumptions. The only material that is consistently likely to be better incinerated than recycled or composted is non-reusable, post-consumer wood, which has had minimal energy input in processing and has limited value in compost.

I would argue that everything else is better recycled or composted. Biogenic and anthropogenic emissions all have the same effect and the short term tipping point for climate change is of more significance than GHG emissions over 100 years.

Any effective treatment for residual waste should be tailored to specific materials and capable of adapting to changing flows and types of material. Mechanical Biological Treatment (MBT) plants are designed to extract recyclable and compostable materials and return them to industrial and biological cycles, recognising that there are very few materials that need to fall outside these cycles. A well planned MBT plant, unlike an incinerator, does not depend on inputs of any specific type, volume or calorific value. The Prosiect Gwyrdd business case for instance included an assumption that 97% of glass in the municipal waste stream was already captured for recycling, therefore it would be present in miniscule quantities in future residual waste. This was wishful thinking which could be disproved by reference to more recent Waste Data Flow reports, and is just one glaring example of how the business case for an incinerator can fall apart more readily than a recycling led strategy.

Many incinerators built a generation ago or more have not been replaced and are no longer needed. At the time they were commissioned recycling infrastructure and participation was not as developed as now, landfill gas recovery was unheard of and it seemed better to recover energy from waste than get no benefit from it. This is no longer the case. Within Europe alone there are regions and countries larger than Wales achieving recycling rates of above 70% (excluding incinerator bottom ash), eg Flanders, Netherlands. The experience of high diversion programmes (70-80% or more) is that the residual waste is no longer dominated by a high calorific mix of paper and plastic, it consists of food waste, sanitary products, DIY waste, multi-layer packaging and miscellaneous mixed material items. The road to these high recycling performances includes provision of comprehensive, accessible services – this includes kerbside, commercial, public bins, etc – but also behavioural change over time. Flanders has passed the 70% mark after 25 years of strategising, although even now the municipalities don't target as many materials as here in Newport.

Approving Prosiect Gwyrdd in its present form effectively puts a ceiling on Wales' recycling rate for years to come of well below 70%. While suppressing recycling and reducing incentives for local authorities to separate materials it still does not guarantee that residual waste will be suitable for combustion. The logical approach for a high performing local authority involved in Prosiect Gwyrdd is to either withdraw recycling collections of certain plastic or paper based

materials or to use them when presented for recycling to supplement mixed incinerator feedstock.

Finally there is legislative and fiscal policy. The Welsh Assembly has only recently had the power to introduce statutory recycling targets and it is not yet clear how or whether this will make a difference to local authority strategy. The Landfill Allowance Scheme, the limited producer responsibility legislation, material specific taxes and landfill bans so far introduced have shown some results in the behaviour of manufacturers, retailers and collection/disposal authorities. Legislatures that have chosen to extend producer responsibility, tax or ban landfill for a wide range of materials, and set binding targets over time, are now seeing recycling rates of over 80%.

Question 2

What are the advantages and disadvantages (in terms of the environment, health, local economy etc) of incineration?

Advantages and disadvantages of incineration should be considered in relation to each individual material, in the context of a diminishing and changing municipal waste stream and in comparison with viable alternatives over the lifetime of the project. There is nothing wrong with incineration per se. The changing materials mix in residual waste demands a flexible solution which allows for success in prevention, recycling and composting. An optimal approach will put these processes at the forefront, will seek to divert materials even when presented in residual waste, and will base any physical disposal method on risk minimisation rather than an attempt to offset the energy wasted by failing to recycle. In the process literally thousands of jobs could be created in collection, handling and importantly re-manufacturing against the 45 or so permanent positions expected by building an incinerator.

Incineration of some materials in some circumstances, as described above, is the best option in environmental and economic terms, and has minimal health impacts if carried out to suitable standards. I am not an expert in the advantages or disadvantages of incineration in any of these terms, but I know that there is at very least a valid debate about the health/environmental impacts of incinerating some common waste materials and that there is no proposal to eliminate these from the feedstock. If the profile of residual waste in existing high recycling areas is used as a guide the energy and resource input compared to the output will make incineration the most inefficient technology to use and will increase an already disproportionately large budget.

In reality plastic, as a fossil-based commodity, is likely to become scarcer, more valuable and less prevalent in 'disposable' packaging; it is also likely to be captured for recycling at a greater rate, as its value will be greater as a raw material than a fuel. Paper and other fibres might or might not be present in the same quantities and there are various predictions about changes in consumption patterns and resource use, but the one known fact is that the current waste composition will change and that any technology chosen to treat it should be adaptable. At a minimum it should have flexibility in terms of volume and composition and it should allow for success in the application of processes higher in the waste hierarchy – if less resources are consumed, if recycling and composting are optimised, does the business plan for an incinerator lose its validity?

There is a very real danger that incineration will hamper rather than complement the preferable alternatives. A simplistic but recurring analysis of under-capacity incinerators is that the capital investment once committed to artificially suppresses the handling cost per tonne to an anti-competitive level through subsidised gate fees and penalty payments. This distorts the market to such an extent that health and environmental arguments are almost irrelevant – recouping a multi-million pound investment and avoiding further budgetary waste could become the main driver for local authorities in the short to medium term, because non-financial considerations are longer term issues they can not afford to face. This is IF the incineration project goes ahead. If it doesn't there is no obvious reason to doubt that there will be market capacity in paper mills and plastics reprocessors for the high calorific materials.

Recycling provides economic benefit through job creation in collecting, sorting, processing and re-manufacturing – a labour intensive collection and sorting process alone can generate approximately one new job for every 200 tonnes per annum diverted. It encourages manufacturing and associated industries close to the consumption point of materials, whereas incineration or any other process which destroys their physical properties only partially offsets energy inputs and leaves a requirement for extractive, agricultural and manufacturing processes. These are currently based overseas in many cases, especially in the production of plastics. The local economy will benefit from recyclate, particularly oil-based, more than an energy source which contributes less than the embedded energy in its manufacture. Similarly the environmental and health benefits of recycling are realised in comparison to the alternatives – incineration releases potential toxins (depending on the feedstock) and has a net energy (therefore GHG) cost, while recycling produces no net emissions of any significance if the energy input is responsibly sourced.

Question 3

Do you think it's a good idea for local authorities to collaborate on waste policy, which could lead to resource savings, or [is] it more important for them to find the most appropriate solution for their locality? What are the reasons for your answer?

The differences in waste policy between local authorities in Wales are not generally based on the demands of residents or on best practice for the demographics or geography of each area. They are more likely to be based on historic approaches to refuse collection and disposal and the skill set available within the authority. There is an opportunity to greatly improve collection services and align them to the best environmental and economic options for each material. However this is not about local autonomy or about large scale, long term contracts for processing (without reappraising collection systems), it is about starting with the end point in mind, concentrating on performance and value and inviting competition at the appropriate level.

There are savings to be made from joint procurement in collection, sorting, processing and other elements of recycling and waste management. In terms of collection and (depending on the method) sorting there is little advantage to working on a scale larger than the average Welsh local authority, as long as the management and methodology draw on relevant best practice. The key is to use a service configuration that suits the area and realises the value of residents' efforts in sorting materials, rather than adopting methods based on existing resources, practices or targets.

In the case of many local authorities this has meant adapting a refuse collection system rather than taking a step back and looking at long term development. In the case of Welsh local authorities there has been very little open competition for collection contracts which might improve the performance and efficiency of the whole system over time. This is tied up with a tendency to extend the influence of refuse collection experts within the authority rather than developing recycling experts, who are best placed to redesign the service in which residual waste is a minority material. Best practice examples for different population densities and demographics are now abundantly available in Wales, the UK and further afield. The chief limitation on replicating these successes seems to be contract timescales – where an English local authority might have a five to seven year contract cycle and struggle to make significant changes in between, a typical Welsh local authority has no fixed cycle at all, which can mean no reappraisal of systems, resources or management.

It has already been determined by the Welsh Government that Wales is not getting good value from its current recycling services, and that they will become even less competitive as recycling rates increase. This is not the fault of individuals so much as the widespread resistance to competitive tendering. Local authorities may have the ideal system for the area, the ideal fleet of vehicles, depot distribution and management team to deliver on the Welsh waste strategy, but without the introduction of a contract cycle they have no opportunity to prove that or to improve performance in the face of competitive challenge. Private companies that operate a number of recycling contracts have an automatic knowledge advantage, which can not only give cost savings but can draw on high level expertise in health and safety, communications, marketing the recyclate collected. To an extent a consortium of local authorities could achieve the same, and regional contracts such as Somerset and Wiltshire have proved the effectiveness of a shared methodology and client team. These collaborations were effective because individual local authorities were prepared to harmonise their systems over time in the interests of overall efficiencies and savings. The key was pooling of knowledge and management, rather than resources, which tend to remain tied to particular areas.

I've concentrated on collection systems because they have tended to be the driver for processing, recovery and disposal decisions in the past, and I believe they may continue to be. This is clearly the wrong way round and is why in many cases inappropriate policy decisions are being made. If it is assumed that the collection method is essentially the same for refuse and recyclate – bins/bags, no pre-sorting, some level of compaction – the options for the materials collected are instantly reduced. The question is only what facility will charge least/pay most (depending on market conditions) for what the RCV (Refuse Collection Vehicle) is delivering? Turn this the right way round and the question is two fold:

- A. What is the most appropriate and practical use of the materials arising in the municipal waste stream?
- B. What is the best collection, sorting and processing configuration to achieve this?

There may be some Welsh local authorities that are so far away from some materials markets that the best environmental and economic option for these materials is to incinerate or even landfill them in the short term. For example the landfilling of an inert substance – glass – may be preferable to the net energy expenditure of shipping it great distances by road and/or sea to get it recycled. In the lifetime of this project however the answer to Question A for nearly every material in nearly every part of Wales will be recycling or composting. The answer to Question B might vary in many ways operationally – containers, vehicles, collection times, bulking points – but the objectives are the same, ie to present a useable quality of food waste to anaerobic digestion plants, green waste to composters, paper to paper mills, plastic to

plastics reprocessors etc. Markets exist and are being developed in every case, and reprocessors will offer competitive prices as long as the recycling boom continues, with some local differences. Those local authorities which are furthest from market hubs may find a monopsony (single or unduly influential buyer) situation arising and/or a monopoly, in which the reprocessor is dependent on a single source of material – neither of these can offer a sustainable and cost-effective solution and should be avoided. Large scale incineration targeting municipal and commercial material is however the most extreme example of a monopsony imaginable – it completely distorts the market for waste management companies, reprocessors and manufacturers.

Every local authority area in Wales has some level of commercial and industrial activity, and therefore alternative sources of waste/recyclate. Joint markets for municipal, commercial and industrial materials may need development, as with the AD infrastructure emerging for food waste, but they don't need to be managed or commissioned by local authorities. The priority for local authorities is to ensure the intermediate stages of streaming and sorting are carried out to the satisfaction of residents and reprocessors. The geography of some local authorities, especially in South East Wales, does have potential for collaboration in bulking at least. However it should be recognised that reprocessors will pay good prices for loads of 20 tonnes or so with minimal mechanical processing (sorting, flattening, baling, shredding etc) and therefore capital investment. The geographical factors and sparse population of many areas may make collection and transport costs higher but do not lead to significantly lower net prices. A certain amount of flexibility not only helps recycling services spread their risks but offers more opportunities for emerging industries using secondary materials. Needless to say a long term incineration contract does the opposite.