

National Assembly for Wales
Environment and Sustainability Committee
RW 34

Inquiry into recycling in Wales

Response from: Axion Consulting



Tudor House
Meadway
Bramhall
Stockport
SK7 2DG



Tel : +44 161 426 7731
Fax: +44 161 426 7732
info@axionconsulting.co.uk



Committee Clerk
Environment and Sustainability Committee
National Assembly for Wales
Cardiff Bay
CF99 1NA

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Dear Sir or Madam

Inquiry into Recycling in Wales by the National Assembly for Wales Environment and Sustainability Committee

Axion Consulting is pleased to be able to provide evidence to the Environment and Sustainability Committee of the National Assembly for Wales on Recycling in Wales.

Axion Consulting are specialists in resource recovery, developing and operating innovative collection and processing solutions for recovery and recycling of waste materials. The company was created in response to increased demand from a wide range of clients within the recycling and resource recovery sector for practical development of new processing and collection methods.

Axion Consulting has specific expertise and experience in advising local authorities and waste management companies on the collection and sorting of dry mixed materials for recycling and has provided some insights to these aspects in our evidence. Our particular materials expertise lies with plastics as a result of a large number of sorting and separation trials carried out for WRAP and many other public and private sector clients. A number of key points which we consider are relevant to the inquiry are set out below with our views on these issues.

1. What is a realistically achievable recycling target?

- 1.1. There has been a recent debate around falling household recycling rates in the UK, with suggested reasons for this decline including 'green fatigue' (whereby recycling has become so complicated that householders are not doing it), changes in the mix of materials collected (as people move away from traditional newsprint to on-line media and more lightweight packaging is placed on the market), and the need to focus on 'harder to reach' materials instead of the previous quick wins. There is also expected to soon be an announcement from the EU on the future targets for recycling of materials (with figures as high as 70% being mentioned) and also the strong possibility of landfill bans.
- 1.2. Therefore Axion think it is important to take a step back and consider what the maximum achievable recycling rate could be. For example, as an ultimate, absolute, best case scenario, if;
 - 95% of households in Wales are provided with separate recycling collection facilities; and
 - 90% of those households actually participate in the collection scheme; and
 - 90% by mass of all black-bag municipal solid waste (MSW) is material that is suitable for recycling; and
 - 90% of all of the recyclable materials arising in MSW are captured, sorted and put out for collection; and
 - 90% yield of output recycled materials is achieved at a Material Recovery Facility (MRF) after sorting to remove any contamination.

Then, the maximum amount of material that could be counted as being 'truly' recycled would be **62% by mass** of the arising MSW stream (i.e. 95% x 90% x 90% x 90% x 90%). Note – there are many material reprocessors who would then claim that a further 'yield impact' needs to be included in this scenario, namely the processing yield at the end reprocessor site where the 'sorted waste infeed' finally gets converted into a useful 'product' and all of those sites would be amazed to reach a 80-90% overall mass process yield – so a final 'product yield' of 50-55% by mass from MSW.

This simple mathematical treatment of the overall system mass balance resulting from a multi-stage collection, sorting and recycling process does give a feel for just how far Wales and the rest of the UK has to advance over the next few years in order to further boost our recycling performance as a nation. Obtaining actual figures anywhere close to the ~90% levels for any of the above 'yield stages' in the multi-stage 'urban mining' process would be viewed as 'fantastic' by most local authorities across the country.

If you repeat the above calculation with a more realistic set of yield numbers then the output (as measured for the overall process, not just the kerbside collection) is still pretty unimpressive:

- 80-85% of households in Wales are provided with separate recycling collection facilities; and
- 65-75% of those households actually participate in the collection scheme; and
- 70-80% by mass of all black-bag MSW is material that is suitable for recycling; and
- 60-70% of all of the recyclable materials arising in MSW are captured and put out for collection; and
- 85-90% yield of output recycled materials is achieved at a MRF after sorting to remove any contamination.

Then the 'kerbside to back-of-MRF' recycling rate comes out in a range of 20% to 32% by mass of the original MSW arising. This is before any losses at the final, but most important, waste to product reprocessing plant. These relatively low numbers probably represent a more realistic measure of the actual recycling rates being achieved in the so-called 'best performing' local authorities across the UK.

1.3. In practice, most local authorities are finding that even reaching recycling rates at these more realistic levels is very difficult. There are many factors impacting upon this issue, including:

- Confusion amongst residents about what materials they should (and should not) be recycling;
- Packaging and product design making it impossible to easily identify and sort complex items into one of the separate material streams, both at kerbside and at the MRF (we call these items 'monstrous hybrids' at Axion);
- Low levels of participation in some demographic areas for cultural or lifestyle reasons;
- Poor levels of extraction of materials by the 'urban miners' at the point of disposal, giving low capture rates (due to laziness, poor attitude, ignorance, low social responsibility, space constraints, etc.);
- Lower yields of high quality recyclates at primary sorting MRFs resulting from poorly segregated materials and high levels of unwanted contamination leading to high output losses into residual waste;
- Poor operating efficiency at MRFs related to plant design and process management limitations; and
- Low product yields at final reprocessor facilities, often related to complex mixes of low quality infeed baled materials.

1.4. There is thus a great deal to be done in this whole 'recycling system' and the Welsh waste collection stakeholders have a great part to play in improving performance of the early stages of the 'urban mining' process described above. There is an important role for government to play in helping to accelerate the rate of increase in recycling and some suggested ways to do this are:

- Helping local authorities to deliver communication programmes to residents and businesses to increase the levels of understanding about 'correct' recycling practices;
- Supporting educational activities with the younger generations in schools and further education establishments;
- Promoting and rewarding changes in product and packaging design that lead to simpler and easier to understand sorting tasks for the primary 'urban miners'. One good way to support this is to promote a much more widespread use of clear on-pack recycling labels (OPRL) by all retailers in Wales;
- Encouraging better monitoring and measurement of the actual flows of materials through the collection and primary sorting stages of the recycling process in order to take responsibility for the resulting yields of useful materials out of the 'back-end' of the final recycling steps; and
- Encouraging an active debate between local authorities and their appointed collection and sorting contractors to focus upon bench-marking of their own material yields (and contamination levels) against a set of national 'best performer' targets. This could be done by using the statistical data collected under the Materials Facility Code of Practice legislation (and more detailed reports) in order to fully understand where management actions need to be focused to tackle problem areas.

These are just a few of the ideas that Axion has to help drive forwards and upwards with materials recycling in Wales.

2. Focus should be on total waste management systems not on individual elements such as kerbside collection or initial material sorting

2.1. In the past some local authorities have tended to focus on specific aspects of a recycling service such as the collection process to be used, because it is these 'front-end' stages in the overall materials recovery chain where they are thought to have most influence and responsibility. The system may be fragmented with waste collection authorities (WCAs) focusing on methods of collection of recyclables from households and waste disposal authorities (WDAs) and waste

management companies arranging for the material to be sorted and finding profitable outlets for it. In parallel the local authority members may be more focused upon the attitudes and opinions of the local residents in relation to their levels of satisfaction with the provided waste collection services.

- 2.2. To improve recycling rates, and the quality of yield, Axion Consulting advises local authorities to consider the recycling supply chain as a whole chain of material recovery steps, and not just to focus on specific aspects such as the collection system. All organisations within the waste to recycle supply chain must also be aware of their responsibilities within the system to ensure that they work together to achieve a set of shared goals. This approach has been demonstrated to work well through a number of partnerships, including Project Integra in Hampshire and the Kent Resource Partnership.
- 2.3. To support this approach, Axion Consulting welcomes WRAP's recently published Waste Regulations Roadmap as it provides a framework for local authorities to conduct a rigorous review of current practices across their whole supply chain and furthermore requires them to consider what is TEEP (technically, environmentally and economically practicable) for each material that they collect for recycling. Application of the Roadmap and TEEP should ensure that a WCA considers not only what it collects for recycling and how it is collected, but also that the material goes to a properly managed MRF, that delivers a good yield of high quality material and that the material has an established end-market either in the UK or overseas. The Roadmap also encourages regular review of systems to ensure that they continue to meet TEEP.
- 2.4. Axion Consulting considers that the application of TEEP principles will lead to the introduction of better waste management and recycling practices driven by sound management information and WCAs, WDAs and waste management companies working more closely with providers of MRFs. The overall focus of the shared management of these sometimes complex processing chains should be moved to a 'total system' performance monitoring approach, with each 'supplier' and 'customer' having a more open-book relationship about the operation of their own part of the recycling chain and how it is influenced by the upstream stages in the process.
- 2.5. In summary the responsibility of the local authority for delivering higher recycling levels does not stop at the kerbside.

3. Comingled collections can yield high recycling rates, even for plastics

- 3.1. European legislation is focused on separate collections of paper, glass, metal and plastic. However, source segregated collections rely on the expertise and diligence of individual householders. Some organisations in the sector have suggested that falling recycling rates may be impacted by 'green fatigue' - where householders have become frustrated with the complexity of recycling services and so stop doing it. This re-emphasises the need for recycling collections to be made 'simple to use' for the householder in order to increase rates of participation and materials capture at the kerbside.
- 3.2. In 2013 more than 2.5 million tonnes of plastic packaging were consumed in the UK, of which more than 1.9 million tonnes were from households. Of this more than 440,000 tonnes were collected for recycling. However actual recycling rates for different categories of plastic packaging ranged from 19% for pots, tubs and trays to 58% for plastic bottles¹ (Recoup 2013). Furthermore flexible packaging (for example carrier bags, food bags, confectionary wrappers, crisp packets and food/ detergent pouches) makes up 32% of consumer plastic packaging waste in the UK however, virtually all of this 556,000 tonnes/ year, currently ends up in landfill. The packaging regulations have set a target to recycle 57% of plastics by 2017.
- 3.3. Recent research and analysis by Axion Consulting for local authority clients has shown that offering a comingled dry recyclable collection scheme which includes all plastics, including bottles, pots, tubs, trays and films, could triple the amount of plastics collected overall, compared to collecting a single plastic packaging stream such as bottles. Also it has been shown that when pots, tubs and trays and films are added to the target plastics collected and this is communicated to householders, then the percentage of plastic bottles captured also increases.
- 3.4. A well designed comingled collection makes the system as simple as possible for householders and so maximises participation and material capture rates. It can also significantly reduce the amount of waste left in the residual bin or black bag, which is often made up of plastic films and harder to recycle items. This in itself then delivers further benefits by reducing the collection cost of the residual waste and enabling longer frequency collection patterns to be utilised (for example fortnightly or even monthly residual collections).
- 3.5. If a total waste management system approach is taken, comingled material would be taken to a properly designed and operated MRF that would separate out the plastic fraction and provide it in mixed bales to a Plastics Recovery Facility. The Plastics Recovery Facility would then focus on maximising the value from the mixed plastic waste stream. Although there are currently limited recovery options for flexible plastic packaging, this area provides a massive opportunity for increasing recycling rates, and it is suggested that as with plastic bottles, a recycling rate of more than 50% could be achievable within ten years with the right mix of collection, sorting and reprocessing infrastructure and associated householder educational and promotional campaigns.
- 3.6. Although it is a new and very complex area, it has been suggested that with a robust evidence base, comingled collections may be considered as TEEP under the EU Waste Framework Directive. Axion Consulting welcomes TEEP and encourages local authorities to use it as a positive opportunity to rigorously review all options and aspects of their

¹ Recoup, UK Household plastics collection survey, 2013

recycling supply chain. With experience of working with a number of authorities to model recycling options, Axion Consulting is well placed to provide support to Welsh Local Authorities with this process.

4. Benefits of recycling need to be shared throughout the supply chain

- 4.1. To encourage a sense of ownership, with increased participation rates and improvements in quality of material throughout the recycling supply chain, systems need to be put in place to ensure that stakeholders all get some benefit from a well-managed scheme. For example, Axion Consulting advises that local authorities put in place contractual arrangements that ensure they are aware of the financial value of recyclable material as it passes through the waste management system and that they receive some of the financial benefits of providing good quality recyclable materials to that chain. Where material goes to a MRF and potentially a secondary recovery facility such as Plastics Recovery Facility, there should be a clear agreement as to who will deal with which element of the waste stream. If there is an opportunity to share the benefits of maximising yields and quality of outputs then this should also be put in place and reviewed as part of the regular systems management process.
- 4.2. It is suggested that financial benefits received by a WCA could be used to reward householders for their input, for example through a reduction on the waste collection element on their Council Tax bill. WCAs should also focus on educating householders so that they better understand what happens to the material they put out for recycling and how they can impact its quality and yield further up the supply chain. This could be through partnerships with local media, local community groups or schools. Visibility of information and good quality feedback is vital here as a key part of the task to encourage and motivate the householders; they are, after all, the coal face 'urban miners' who are the first link in the recycling chain.

5. Duty of Care for recyclable materials should apply from the householder's front door to the recovery facility back door

- 5.1. To further promote a sense of ownership of materials collected for recycling and a focus on the total waste management system, the Duty of Care for local authorities should apply to material from the point at which a householder places it in a recycling container to the backdoor of the MRF or even secondary reprocessor facility such as a Plastics Recovery Facility.
- 5.2. Axion Consulting would even suggest that Duty of Care should apply further, to a point at which material has been sorted into a single material type with 95% purity. This would help to encourage ownership of material, and focus on the wider system, not just collection operations. A local authority would be able to demonstrate that the whole system has produced high levels of good quality material, and this would encourage authorities to pay closer attention to the activities of those further up the supply chain, for example MRF operators and end-markets for recycled material.

I hope that these points are helpful to this consultation process. Axion Consulting is very happy to provide oral evidence to the inquiry if you consider that this would be helpful, in particular on the complexities and technicalities of collecting and reprocessing different types of plastics and the points we have presented here.

We are also well placed to help Local Authorities better understand options that are available to them and to model impacts of different collection systems if this is required.

If you have any queries or would like to discuss our response in more detail please do not hesitate to contact us.

Yours sincerely



Keith Freegard

Director, Axion Consulting