How to unlock the wealth in WEEE in 2019

UNTHA
shredding technology

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Introduction

The recycling of e-waste is currently dominating the waste industry media, not least because updated legislation is continually coming into force. But there's more to e-waste (or WEEE) recycling progress than recovery rates alone. The industry needs to pay more attention to recyclate quality too.

The purpose of this guide is to therefore summarise the evolving state of the WEEE landscape, before critiquing some of the methodologies that can be used to recycle this complex waste stream and highlighting the specific technologies that can be implemented to ensure best practice.

If at any point you have any questions, please contact UNTHA UK's e-waste specialists by calling ***0845 450 5833*** *or email* ***sales@untha.co.uk*** *and the most appropriate member of the team will be in touch.*

WEEE in the headlines

The subject of WEEE doesn't ever seem to leave the headlines, with collection targets a common theme. Whilst producers may have rejoiced at Defra's target easing in the spring of 2018, for instance, there were others in industry who vocally expressed their disappointment at the news, especially on the back of a similar trend the previous year.

The UK's overall collection goal in 2017 was 622,033 tonnes, significantly less than the EU's aim for the nation to salvage 776,000 tonnes. At the time, we polled visitors to our website who expressed feelings of deflation, with 58% believing the targets were too low and risked stalling progress.

Fast forward to April 2018 and it was confirmed that, following proposals of a further reduction, Defra was standing by its target of only 532,818 tonnes for 2018 – almost 100,000 tonnes less than the already-lowered objective set for the previous 12 months.

It should be noted that there are multiple variables at play when setting targets, of course. For instance, individuals' decreased use of outdated technology such as gas discharge lamps – in favour of more modern, longer-lasting LEDs – naturally has an impact on target setting.

Targets must also be achievable – there is little point them existing for targets' sake. Official statistics highlighted that UK producer compliance schemes (PCSs) in 2017 underperformed by 15%, for instance – even at the reduced levels. So, the UK achieving its EU member state target of 768,211 tonnes for 2018, would arguably have been nigh-on impossible.

But in the absence of impetus to act, will industry mindsets become more passive? According to the European Commission website, WEEE remains one of the fastest growing waste streams in the EU. With arisings mounting by 3-5% per year, now is not the time to stop driving for change.

Regulatory changes

There is constantly great debate surrounding the ongoing changes to the UK WEEE Directive 2013 too. It had long been proposed that, in January 2019, the country's producers would move to an 'Open Scope' implementation within which all items of electrical and electronic equipment (EEE) would fall under the Directive's regulatory requirements, unless a specific exemption was highlighted to state otherwise.

A lengthy consultation with industry ensued and in May 2018 Defra published the decision that whilst Open Scope would be introduced as planned, and UK EEE producers would continue to report into the 14 existing categories, not the six that have been created at EU level. Newly-named Open Scope products would simply be allocated to one of the 14 categories.

This outcome has seemingly pleased the masses, given 75% of consultation respondents overall voted in favour of the reporting protocol remaining as is. The numbers are said to have differed slightly between trade bodies, treatment facilities, producers, and Producer Compliance Schemes (PCSs) but this route was the most preferred.

This is not to say that WEEE collection and processing will suddenly become easier, but at least the reporting process will not be any more burdensome. It is at Government level that the compliance headache perhaps exists, to ensure data can be presented to the EU in the format required, but this outcome was the Government's preferred option too.

At the time of writing, it is understood that WEEE product scope guidance is currently being reviewed, to add greater clarity as to the electrical and electronic equipment which will soon be included within the regulation.

It has also been confirmed that the Government would make the Producer Balancing System (PBS) compulsory, to ensure B2C waste management costs are distributed evenly across all producers. 76% of consultation participants opted in favour of this proposal.

Finally, another major statistic to emerge from the consultation, was the extent to which respondents believe the 2013 WEEE Regulations have achieved the objective of increasing levels of recovery, recycling and reuse in the UK. 37% said the legislation had made a high or strong impact, whilst the majority (41%) opted for 'moderate'. When questioned on the level of investment stimulus that the regulations have generated, 31% believe there has been no impact whatsoever, with 45% relenting that there has been an albeit moderate impact.

These findings perhaps go to show that whilst regulation does drive change, it is not enough in isolation.

Best-practice methodologies

Irrespective of the legislative landscape surrounding WEEE, it is arguably important to focus on best-practice and aim for excellence, as much as is practically possible.

The exact treatment of WEEE is likely to vary significantly depending on the nature of the arisings and the preferences of the 'waste' handler. Some facilities deploy industrial shredding technologies for instance, particularly common for the compliant destruction of equipment such as hard drives that could contain sensitive data. Others opt for either manual or machine-led disassembly processes, or even a combination of both.

It must be noted that different rules apply depending on the methodology adopted, too. As the HSE website outlines for example: *'For shredding operations, treatment facilities may not be required to remove [specific] components and substances. This is dependent on the size and type of technology used, although some hazardous components and substances must be removed in advance to avoid risks to health and safety and damage to equipment.'*

Presuming legislative compliance is a given, attention should then turn to the techniques that facilitate utmost adherence to the waste hierarchy.

In many cases, seemingly outdated WEEE can be **refurbished for re-use**, providing it is stored correctly prior to being handled – being left outdoors in a cage and exposed to the elements is not ideal, for instance.

Beyond that, a **material liberation strategy** should be prioritised as the next-best option, to ensure maximum recyclate recovery rates. Some firms opt for the **manual breakdown of equipment**, by trained professionals. Whilst this labour-intensive process naturally takes time, it can result in the successful extraction, segregation and re-insertion of valuable commodities such as gold, copper and palladium, back into the supply chain.

Other organisations – such as those who deem this manual methodology uncommercially viable – seek to design a **shredding operation** to release these valuable recyclates instead. A hammer-mill machine – which works by smashing aggregate material into smaller pieces with repeated impact blows – was once the preferred option for this. However, such equipment is typically high speed, which creates vast amounts of dust and struggles to achieve the particle refinement required for downstream separation technologies to effectively do their job.

A four-shaft shredder with screen, on the other hand, will ensure the production of a homogenous fraction. With high torque and slow speed, this will protect the machine from wear, increase uptime and deliver added efficiency. The integration of an overband magnet will also help extract ferrous metals, an eddy current separator (ECS) can separate out any non-ferrous metals, and an optical sorter can finally clean anything that the ECS hasn't already refined.

The wealth in WEEE – is it worth the investment?

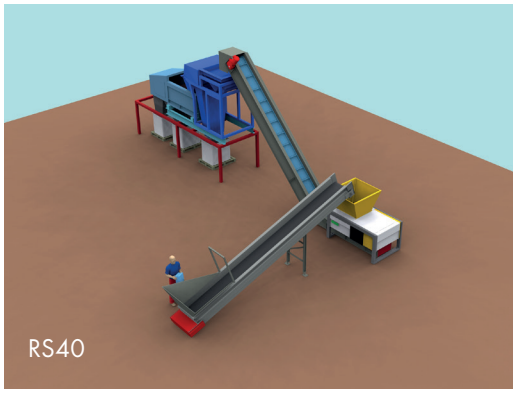
The investment in new or improved WEEE recycling systems may not be something that these specialist waste handlers have considered to date, especially if recovery rates until now have been satisfactory.

But a recent article in Information Age stated that the total value of all raw material in global e-waste, in 2016 alone, was estimated at approximately €55bn. To put this into context, this figure was higher than most countries' GDP for the same year.

As the article also quite rightly pointed out: *'Given that the fate of up to 80% of global e-waste is unknown, there is considerable scope for businesses to capitalise on an overlooked opportunity.'*

Systems in action

Often the key difficulty lies in knowing where to start when devising a new waste handling system. That's why the UNTHA UK team has drawn up some sample solutions that could help to unlock the wealth in WEEE, that has been outlined within this document.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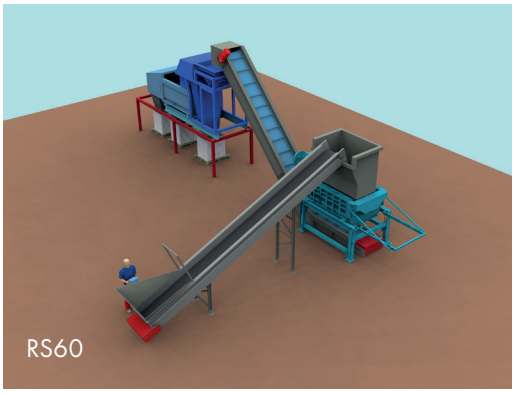
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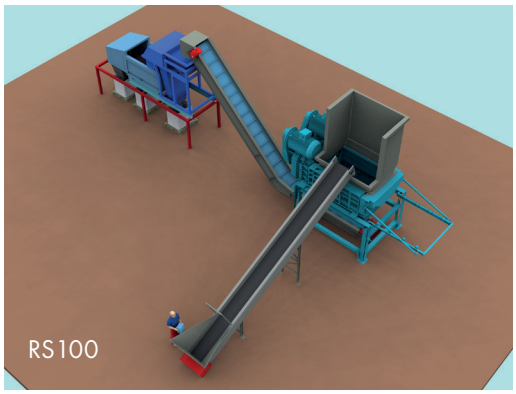
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Here you see:

- Feeding conveyor with low-level bulk feed hopper (for easy material in-feed)
- An UNTHA four-shaft shredder (sized to suit the e-waste application)
- Incline transom-style discharge conveyor (ensures minimum head-height required and ease of ECS feeding)
- Pan-feeder and in-line drum magnet for FE removal
- Eddy-Current Separator for Non-FE removal
- Integral bagging system for individual material streams

Conclusion

In summary, the WEEE landscape is certainly changing – a trend that isn't likely to alter any time soon. However, a push for best practice should remain a constant, due to the compliance, environmental and revenue yield benefits that are feasible with smart thinking.

To discuss your specific e-waste scenario and/or to learn how to untap the wealth in your WEEE, please contact UNTHA UK on T: ***0845 450 5388*** *or E:* ***sales@untha.co.uk*** *for a no-obligation chat.*