

LEVEL 7 ASSESSMENT SPECIFICATION

Student name:	Richard Black	Student ID number:	1803287
Programme:	MSc Property & Facilities Management		
Module:	Sustainable Processes		
Module code:	M7X01815	Contribution to Overall Module Assessment (%):	50%
Lecturer:	Dr Juan A Ferriz-Papi	Internal Verifier:	Prof Chris House
Assignment Title:	Case Study Audit	Word count (or equivalent):	1,500 words
Submission deadline:	30 th April, 2019	Return date of provisional marks & written feedback:	27 th May, 2019
Submission method:	All written assessments, where practical and possible, must be submitted via Turnitin unless otherwise instructed by the Lecturer. (Please DO NOT put this assessment specification into Turnitin or it will match many similarities with other students' submissions.) Alternative submission method (if applicable): N/A Late submission of the assessment will result in a late penalty mark. Penalties for late submission: Up to one week late, maximum mark of 50%. Over one week late, 0%. Only the Extenuating Circumstances Panel may approve a change to submission dates.		
Academic honesty / referencing:	Academic honesty is required. In the main body of your submission you must give credit to authors on whose research and ideas your work is based. Append to your submission a reference list that indicates the books, articles, etc. that you have used, cited or quoted in order to complete this assessment.		

Module Learning Outcomes (from module syllabus)	
1	make informed decisions and formulate policies concerning sustainable development
2	critically analyse the demands that the built environment places on the natural environment
3	contextualise and critically evaluate current key trends with regard to sustainable development

TASK DESCRIPTION

The aim to cover with this task is to analyse circular economy for specific waste streams coming from the building use. You will choose one building (residential, commercial, industrial, educational or health) and you will select one specific activity developed. For this activity you will work the following:

- Make a scheme of the material flow occurring during the whole process for that activity, showing inputs and outputs. You will draw a process map where all stages will be identified. You do not need to calculate quantities at this stage.
- Select one waste stream and make an estimation of quantities (volume and weight) produced. Identify process of this waste for circular economy, so that it can be recovered as second raw materials. You can provide different solutions and draw a process map indicating these stages.
- Make your own calculations to identify which ones can be considered as up-cycling processes.

The relevance of this task is mainly to obtain and show several schemes that can explain the different processes occurring, as well as to show the capacity to assess the increased value of different solutions, this way proving up-cycling.

Your report will explain the method used to obtain your results, and will allow the comparison of different solutions for the waste stream chosen. You should write a 1,500 word report and add all relevant information gathered and formats at the end as appendixes. Organisation of this information is essential so that you can use it as evidence and will complement your reference list.

Requirements for the report

- You are required to submit the corresponding report by Turnitin (Moodle online submission) no later than the submission date. No hard copy is needed.
- It should be a 1,500 word (± 150 words) formal report, in formal English writing. Text should be in Arial 11 pt, black, single line spaced, justified, paginated, with paragraphs separated by a line space and started left-aligned (i.e. not indented).
- The report should have suitable cover page, table of contents, and headings (and sub-headings if necessary).

GUIDANCE FOR STUDENTS IN THE COMPLETION OF TASKS

NOTE: The guidance offered below is linked to the five generic assessment criteria overleaf.

1. Engagement with Literature Skills

Your work must be informed and supported by scholarly material that is *relevant* to and *focused* on the task(s) set; you should make use of scholarly reviews and primary sources, as appropriate (for example, refereed research articles and/or original materials appropriate to the discipline). You should provide evidence that you have accessed a wide *range* of sources, which may be academic, governmental and industrial; these sources may include academic journal articles, textbooks, current news articles, organisational documents, and websites. You should consider the *credibility* of your sources; academic journals are normally highly credible sources while websites require careful consideration/selection and should be used sparingly. Any sources you use should be current and up-to-date, mostly published within the last five years or so, though seminal/important works in the field may be older. You must provide *evidence* of your research/own reading throughout your work, using correctly a suitable referencing system, including in-text citations in the main body of your work and a reference list at the end of your work.

2. Knowledge and Understanding Skills

At level 7, you should be able to demonstrate a systematic understanding of knowledge, and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of your academic discipline, field of study or area of professional practice, with a comprehensive understanding of techniques applicable to your own research or advanced scholarship. Your work must demonstrate your growing mastery of these concepts, principles, current challenges, innovation and insights associated with the subject area. *Knowledge* relates to the facts, information and skills you have acquired through your learning. You demonstrate your *understanding* by interpreting the meaning of the facts and information (knowledge). This means that you need to select and include in your work the contemporary concepts, techniques, models, theories, etc. appropriate to the task(s) set. You should be able to explain the theories, concepts, etc. meaningfully to show your understanding. Your mark/grade will also depend upon the *extent* to which you demonstrate your knowledge and understanding; ideally each should be complete and detailed, with comprehensive coverage.

3. Cognitive and Intellectual Skills

You should be able to: evaluate critically current research and advanced scholarship in the discipline; evaluate methodologies and develop critiques of them and, where appropriate, to propose new hypotheses; deal with complex issues both systematically and creatively to make sound judgements in the absence of complete data. Your work must contain evidence of logical, analytical thinking, evaluation and synthesis. For example, to examine and break information down into parts, make inferences, compile, compare and contrast information. This means not just describing what! But also justifying: Why? How? When? Who? Where? At what cost? At all times, you must provide justification for your arguments and judgements. Evidence that you have reflected upon the ideas of experts within the subject area is crucial to you providing a reasoned and informed debate within your work. Your choice of methodologies to gather data and information must be rigorously defended. Furthermore, you should provide evidence that you are able to make sound judgements and convincing arguments using data and concepts. Sound, valid, persuasive conclusions are necessary and must be derived from the content of your work. Where relevant, alternative solutions and recommendations may be proposed.

4. Practical Skills

At level 7, you should be able to demonstrate originality in the application of knowledge, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in the discipline. This includes acting autonomously in planning and implementing tasks at a professional or equivalent level, originality in tackling and solving problems, and decision-making in complex and unpredictable contexts or situations.

You should be able to demonstrate mastery of the leading edge subject-related concepts and ideas as they relate to real world situations and/or particular contexts. How do they work in practice? You will deploy models, methods, techniques, and/or theories, in those contexts or circumstances, to assess current situations, perhaps to formulate plans or plausible, justifiable recommendations to solve problems, or to propose new models, or to create artefacts, which may be innovative and creative, thereby demonstrating your understanding of how the boundaries of knowledge are advanced through research and/or application. This is likely to involve, for instance, the use of real world artefacts, examples and cases, the application of a model within an organisation and/or benchmarking one theory or organisation against others.

5. Transferable Skills for Life and Professional Practice

Your work must provide evidence of the qualities and transferable skills necessary for postgraduate-level employment in circumstances requiring sound judgement, personal responsibility and initiative in complex and unpredictable professional environments. This includes demonstrating: the independent learning ability for continuing professional development to advance existing skills and acquire new competences of a professional nature that will enable you to assume significant responsibility within organisations; that you can initiate and complete tasks, projects and procedures, whether individually and/or collaboratively, to a professional level; that you can use appropriate media to effectively communicate information, arguments and analysis in a variety of forms for a variety of audiences; fluency of expression; clarity and effectiveness in presentation and organisation. Work should be coherent and well-structured in presentation and organisation.

STUDENT FEEDBACK FORM

This section details the *extent* to which the assessment criteria are demonstrated by you, which in turn determines your mark. The marks available for each category of skill are shown. Lecturers will use the space provided to comment on the achievement of the task(s), including those areas in which you have performed well and areas that would benefit from development/improvement.

Generic Assessment Criteria	Marks available	Marks awarded
1. Engagement with Literature Skills	5%	
2. Knowledge and Understanding Skills	20%	
3. Cognitive and Intellectual Skills	25%	
4. Practical Application Skills	25%	
5. Transferable Skills for Life and Professional Practice	25%	

Assessment Mark (Assessment marks are subject to ratification at the Exam Board. These comments and marks are to give feedback on module work and are for guidance only until they are confirmed.)

Late Submission Penalties (tick if appropriate)

Up to 1 week late (50% Max)

Over 1 week late (0%)

%

GENERIC ASSESSMENT CRITERIA

Level 7

In accordance with the Framework for Higher Education Qualifications, at the end of Level 7 students should be able to demonstrate: a systematic understanding of knowledge, and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of their academic discipline or area of professional practice; a comprehensive understanding of techniques applicable to their own research or advanced scholarship; originality in the application of knowledge, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in the discipline; conceptual understanding that enables the student to evaluate critically current research and advanced scholarship in the discipline to evaluate methodologies and develop critiques of them and, where appropriate, to propose new hypotheses. They will be able to deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences. They will demonstrate self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level to continue to advance their knowledge and understanding, and to develop new skills to a high level. They the qualities and transferable skills necessary for employment requiring the exercise of initiative and personal responsibility; decision-making in complex and unpredictable situations/professional environments; and the independent learning ability required for continuing professional development.

Level 7	FAIL	FAIL	MARGINAL FAIL	SATISFACTORY (Pass)	GOOD to VERY GOOD (Merit)	EXCELLENT (Distinction)	EXCEPTIONAL (Distinction)
Category	0-29%	30-44%	45-49%	50-59%	60-69%	70-84%	85-100%
Engagement with literature (including current research, referencing, academic conventions and academic honesty)	Little or no evidence of reading and/or reliance on inappropriate sources. Views and findings mostly unsupported and non-authoritative. Referencing conventions used incoherently or largely absent.	Poor engagement with essential reading. No evidence of wider reading. Reliance on inappropriate sources, and/or indiscriminate use of sources. Heavily reliant on information gained through class contact. Inconsistent and weak use of referencing.	Engagement with a very limited range of relevant and credible sources. Some omissions and minor errors. Referencing conventions evident though not always applied accurately or consistently.	Engagement with an appropriate range of research-informed literature, including sources retrieved independently. Some over-reliance on texts. Referencing may show minor inaccuracies or inconsistencies.	Engagement with a wide range of research-informed literature, including sources retrieved independently. Selection of relevant and credible sources. Very good use of referencing, with no/very few inaccuracies or inconsistencies.	Engagement with an extensive range of relevant and credible literature, informed by the latest research. Consistently accurate application of referencing.	Exceptional engagement with an extensive range of relevant and credible literature, informed by the latest research. High-level referencing skills consistently and professionally applied.
Knowledge and	Major gaps in knowledge and	Gaps in knowledge, with	Limited knowledge and	Knowledge is accurate and	Knowledge has a well-defined	Excellent mastery of a	Exceptional mastery of a

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understanding (A systematic, conceptual understanding of knowledge, and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of the discipline; a comprehensive understanding of techniques applicable to their own research)	understanding of the subject matter is not systematic. Substantial inaccuracies. No awareness of current problems, insights or the latest research and/or advanced scholarship within the discipline.	only superficial systematic understanding. Some significant inaccuracies and/or irrelevant material. No critical awareness of current problems, insights, or latest research within the discipline.	systematic understanding of the concepts and principles within the subject area, which to some marginal extent, is informed by current research and scholarship. Some critical awareness of current problems and/or new insights, but often under-developed.	reasonably detailed. A systematic understanding of the field of study informed by, to some extent, current research and scholarship. A critical awareness of current problems and/or new insights though this may be under-developed occasionally.	focus, which is reasonably extensive, coherent and detailed, with a critical awareness of current problems and/or new insights. Exhibits good understanding of the breadth and depth of contemporary and established views, and the work is, at least in part, well-informed by current research and scholarship.	complex and specialised area of knowledge. A systematic, excellent understanding of the concepts of the subject informed by current research and scholarship. Highly critical awareness of current problems and/or new insights. A critical, awareness of how the boundaries of knowledge are advanced through research.	complex and specialised area of knowledge. An exceptionally critical awareness of current problems and/or new insights. An outstanding understanding of the concepts of the subject, well-informed by current research and scholarship. A critical, sophisticated and nuanced awareness of how the boundaries of knowledge are advanced through research.
Cognitive and intellectual skills (Critical evaluation of current research and methodologies and develop critiques of them and, where appropriate, to propose new hypotheses; make sound	Wholly or almost wholly descriptive work. Little or no evaluation or critique or attempt at a systematic approach. Failure to develop arguments, leading to illogical or invalid	Largely descriptive work, with superficial use of critical evaluation of research and methodologies. Absent or weak development of hypotheses and judgements. Information accepted uncritically, uses	Limited attempt at critical evaluation/ critique of current research and methodologies, tending towards description. Limited attempt to propose new hypotheses. Can deal with complex issues	Some critical evaluation/ critique of current research and methodologies, though slightly underdeveloped in places, Proposes adequate but limited new hypotheses, where relevant.	Sound critical evaluation/ critique of current research and methodologies, Proposes new hypotheses, where appropriate. Can deal with complex issues systematically and with some	Excellent critical evaluation/ critique of current research and methodologies, Proposes innovative hypotheses, where appropriate. Can synthesise complex issues systematically	Exceptional critical evaluation/ critique of current research and methodologies, Proposes innovative hypotheses, where appropriate. Exemplary systematic and

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judgements in the absence of complete data.)	judgements. Unsubstantiated generalisations, made without use of credible evidence.	generalised statements made with scant evidence and unsubstantiated opinions. Ideas sometimes illogical and contradictory.	but not systematically or creatively. Some evidence to support emerging judgements but these may be underdeveloped or with a little inconsistency / mis-interpretation. May assert rather than argue a case.	Can deal with complex issues but not fully systematically or creatively. Ability to make judgements based on data (that may be incomplete) but with some tendency to assert/state opinion rather than argue on the basis of reason and evidence.	creativity. Ability to make sound judgements based on data (that may be incomplete)	and creatively. Ability to investigate contradictory or incomplete information and make strong, persuasive, arguments and sophisticated judgements.	creative synthesis of complex issues. Ability to investigate contradictory or incomplete information and make strong, persuasive, arguments and sophisticated, nuanced, judgements. Potential for journal publication or doctoral research.
Practical skills (Originality / creativity in the application of knowledge, tools and techniques and in tackling and solving problems in complex and unpredictable professional situations; practical use of established techniques of research and enquiry to create and interpret knowledge in the discipline.)	Limited or no use of methods, materials, tools and/or techniques. Little or no appreciation of the context of the application. Limited understanding of the application of theory to practice or making appropriate links between the two. Very weak problem-solving skills in complex and	Rudimentary application of methods, materials, tools and/or techniques but without consideration and competence. Flawed appreciation of the context of the application. Weak understanding of the application of theory to practice, with only occasional evidence of	An awareness and mostly appropriate application of well-established methods, materials, tools and/or techniques, with occasional errors. Basic appreciation of the context of the application. Theoretical knowledge and understanding applied in practice, but not always making	An appropriate application of standard methods, materials, tools and/or techniques. Clear appreciation of the context of the application. Mainly consistent, accurate and logical application of theory to practice, making appropriate links between the two.	A very good application of a range of methods, materials, tools and/or techniques. Very good consideration of the context of the application, with perceptive insights. Can identify problems and propose appropriate solutions in complex and unpredictable contexts.	An advanced application of knowledge, methods, materials, tools and/or techniques. The context of the application is well considered, and insightful. Can identify complex problems and propose excellent solutions. An excellent grasp of techniques applicable to own research or	Exceptional application skills in complex, unpredictable, contexts, drawing skilfully on the latest research within the discipline. Can identify complex problems and propose sophisticated, original solutions. An outstanding application of techniques applicable to own research or

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	unpredictable contexts.	making appropriate links between the two. Weak problem-solving skills in complex and unpredictable contexts.	logical links between the two. Can identify problems and propose basic solutions without fully appreciating the complexity of unpredictable contexts.	Can identify problems and propose mostly appropriate solutions in complex and unpredictable contexts, with elements of originality.	Evidence of originality and creativity.	advanced scholarship. Shows originality in application of knowledge and techniques, and of how established techniques of enquiry create and interpret knowledge in the discipline.	advanced scholarship. Shows originality in application of knowledge and techniques, and of how established techniques of enquiry create and interpret knowledge in the discipline with assimilation and development of cutting edge processes and techniques.
Transferable skills for life and professional practice (Exercise of self-direction, autonomy and personal responsibility; plan and implement tasks at a professional level; independent learning; use appropriate media to communicate effectively and professionally to a variety of audiences; fluency of expression; systematic	Communication medium is inappropriate or misapplied. Work is poorly structured, disorganised and/or confusingly expressed. Very weak use of language and/or very inappropriate style. Little or no evidence of autonomy (or collaboration, where relevant) in the completion of tasks. Little or no evidence of	Communication medium is poorly designed and/or not suitable for the audience. Work is poorly presented in a disjointed manner. It is loosely, and at times incoherently, structured, with information and ideas often poorly expressed. Weak use of language and/or inappropriate style. Weak independent	Can communicate in a suitable medium but with some room for improvement. Mostly ordered presentation and structure in which relevant ideas / concepts are reasonably expressed. Work may lack coherence in places. Can work as part of a team, but with limited involvement in group activities.	Can communicate effectively in a suitable format, but may have minor errors. Mostly coherent, organised work, in a suitable structure and is for the most part clearly expressed. Can work effectively independently and/or as part of a team, with clear contribution to group activities. Demonstrates the skills	Can communicate well, confidently and consistently in a suitable format. Work is coherent, fluent, well-structured and organised. Can work very well autonomously and/or as part of a team, with a good contribution to group activities. Demonstrates comprehensive professional, postgraduate	Can communicate professionally confidently and consistently in a suitable format. Work is coherent, very fluent and is presented professionally. Can work autonomously with initiative. Where relevant can work professionally within a team, showing leadership skills as appropriate, managing	Can communicate with an exceptionally high level of professionalism. Work is remarkably coherent, very fluent and is presented professionally. Can work outstandingly well and professionally within a team, showing advanced leadership skills. Demonstrates exemplary

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approach; clarity and effectiveness in presentation and organisation.)	the skills required in professional, postgraduate employment.	initiative (or collaboration, if relevant). Limited evidence of the skills required in professional, postgraduate employment.	Demonstrates some but not all of the basic skills required in professional, postgraduate employment, with some areas of minor weakness.	required in professional, postgraduate employment, with some areas of strength and some of minor weakness.	employment skills.	conflict and meeting obligations. Demonstrates excellent professional, postgraduate employment skills and a strong appetite for further development.	professional, postgraduate employment skills and a strong appetite for further development.



Programme: MSc Property and Facilities Management

Module: Sustainable Processes

Module Code: M7X01815

Lecturer: Dr Juan Ferriz-Papi

Assignment Title: Computer Equipment Circular
Economy Case study

Submission Date: 30th April 2019

Completed by: Richard Black

Student I.D. 1803287

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1.0 Introduction

The purpose of this assignment is to provide an overview of the sustainable product processes adopted in a typical UWE office environment that best describes the inputs and outputs of the selected product through to its waste. For the purpose of this, case study example computer equipment was the chosen product of choice.

With the use of a current regulatory information available, published literature, process map, interviews with key representatives it will aim illustrate how the computer equipment, system inputs and outputs and or lifecycles are, currently managed.

[Appendix 1 – UWE Interviews](#) and [Appendix 4 – Project questions Stone recycling responses](#).

It will take into consideration the waste disposal element associated with the end of life processes giving details of quantities including the weight of the product collection for waste and look to provide rationalised options in relation to the circular economy upcycling rather than a linear type approach with the overall aim of becoming more sustainable in the future.

During this audit process consideration was, also given into the following regulatory systems currently in place in the UK including the UWE Sustainability and waste strategy vision.

ISO 14001:2015 – Environmental Management Systems

WEEE Regulations (2013) – Waste Electrical and Electronic Equipment

BS 8001:2017 - Framework for implementing the principles of the circular economy in organizations – guide.

2.0 Methodology

The following methodology describes what has been, identified through the interviewing of key representatives and what has been understood to be the current practices in relation to the inputs and output processes in the lifecycle of office computers in the UWE environment.

The UWE has a very dynamic and complex lifecycle and waste management process. For example, a specific procedure can initiate automatically when a particular department decides to either, take on new staff complete a lifecycle upgrade or needs to replace machines through damage and or failure.

If a member of staff or a department office need to replace or dispose of their current equipment then they need to complete the online form for the items or equipment no longer required. Once this form is completed, it automatically generates an email to the relevant department and in this case study that would be IT.

IT then visit the equipment and check to see if they wish to keep it and if so another email gets generated for the collection of the equipment to be transferred to the IT stores. It is also at this point; they conduct a condition assessment on the equipment and decide whether it is worth rebuilding for re-use or if it needs to be, sent to the waste team for safe disposal.

If they do not, think the equipment is of any value or use to them then they arrange to get it sent straight to the UWE waste team for initial storage and future collection by the approved waste recycling contractor. By following this, process the aim is to have captured, any computer equipment that is re-usable for the UWE.

During this process I.T, also get a formal request for new computer equipment to replace that identified as no longer required. As described in the process map I.T sign off on this new computer equipment request by being provided a cost centre code from the respective office department. Following this a purchase order is then generated and issued out to the IT procured supplier after being authorised by the UWE finance department. The IT procured supplier then order the required computer equipment from Hewlett Packard (HP) provider.

The HP provider gathers and checks the new equipment approval for delivery out to the IT procured supplier. It is at this stage the new inventory labelling identification process controlled by UWE IT is, applied. The IT procured supplier then repack items and then arrange to deliver out to the UWE IT department whereby its check in, unpacked again and tested before new software builds are installed specific to the clients requirements.

Finally, once the process has been satisfied the new computer equipment is, delivered out unpacked again, installed and test for the client to take receipt. From beginning to end this process in relation to new computer, equipment can respectively take around six weeks to complete.

[Appendix 2 – Process Map – \(Detail Relating to UWE Computer equipment case study\)](#)

When it comes to the computer, equipment waste process the UWE provides approximately 4 – 5 computer waste collections per year to their wastes recycling specialist (Stones). This waste specialist provides a free collection service for items to be, taken off to their own recycling facility.

[Appendix 3 – UWE Recycling Collections](#)

[Appendix 5 – Stones Process Maps](#)

[Appendix 6 - Stones recycling facility - 360° Tour YouTube video](#)

The UWE receives a cash rebate on equipment of around 2 to 3K per collection so in effect anything the UWE does not want is technically getting a second life elsewhere. The cash rebate comes back into the sustainability waste budget for use in managing waste costs.

Once the computer equipment arrives at the recycling facility it is initially weighed, tested and assessed by specialist representatives from here the computer systems are forensically, wiped of any data with the use of industry recognised software compliant to HMG level 5. Any disguising marks, labels and or other forms of identification are then, also removed. Every item of computer equipment receives a unique identification label, from which is recorded and scanned into the specialists system. This enables them to produce the important asset management report and certificate of disposal for their clients providing full traceability.

If the computer equipment is, found not to be suitable for re-use then it is broken down into its components parts then this all goes through the shredding process followed by the vibro-shoot that electrically charges the waste elements in order to separate it down into plastics and metals for the ongoing recycling process where nothing goes to waste.

Sustainability is key requisite for the recycling specialist and any IT computer equipment found to have reached its end of useful life is disposed of responsibly with zero waste to landfill. Stone state the vast majority of refurbished equipment is sold into the secondary market within the UK – this is done via an online Reurb site 'Encore', E bay, Amazon, directly to schools by stone sales teams and in bulk to IT brokers for resale. They work closely with get online UK a UK initiative of getting people within the UK that struggle with computers connected along with their chosen charity IT for Africa giving kids an opportunity for IT educations.

[Appendix 4 – Project questions Stone recycling responses.](#)

3.0 Conclusion

It is apparent from research that no specific procedures in a way that standardises the management of I.T computer equipment are present in the UWE. Dramatic savings would be evident from just making some basic changes to the UWE I.T equipment processes and procedures by way of standardisation.

The processes incorporating end of life and new equipment seem out of alignment with many departments being able to manage the process themselves. This means they could effectively chose to either replace or upgrade their equipment early or late regardless of any lifecycle philosophies and recommended lifespans.

The UWE could see further improved financial benefits from modifying the input and outputs processes of computer equipment by taking a slightly more circular approach.

This could include inter-department exchange programs that provide departments with a limited budgets refurbished equipment from UWE I.T services. All of which could act as an internal recycling scheme and provide cost savings against collection, storage and wastes processes.

Another alternative solution would be that the UWE look into a leasing program or partnership with a reputable manufacturer or provider that operates a circular economy mentality. This would enable the clients like the UWE for example to lease equipment but never own it. By the manufacturer or provider effectively retaining ownership of their product once it reaches end of life it could either be refurbished and re-used or shredded into it component element to later be used in another sector as a technical nutrient food for a different product.

It is evident that more options are becoming widely available to customers but the processes that supports and legislates this and the circular economy seem to be still in their infancies. Most waste recycling specialists seem to suggest or use the term “zero waste to landfill” which encourages clients to use them thinking this a sustainable process in managing their waste.

Although in some cases a lot of computer equipment where refurbished or shredded into its component elements gets distributed to other countries like Africa diminishing any corporate responsibilities or obligations further.

This in effect surely just migrates the issues of managing waste whatever the product to being the responsibility of other countries that in some respects not advanced enough in their own recycling waste management processes that could result in landfill or incineration rather than re-use.

The management surrounding e-waste within a circular economy is still very much a developing process and inevitably, any costs associated with the waste process will subside with the continued growth of recycling services offered along with new legislation and education.

4.0 References & Bibliography

References

1. The British Standards Institution BSI (BS 8001:2017) *Framework for Implementing the Principles of the Circular Economy in Organisations – Guide*. Available at <http://www.ihsti.com/CIS/search?t=BS%208001> (Accessed Online Sunday 10th March 2019)
2. The British Standards Institution BSI (BS EN ISO 14001:2015) *Environmental Management Systems Requirements with guidance for use*. Available at <http://www.ihsti.com/CIS/search?t=bs%20en%20iso%2014001> (Accessed Online Wednesday 6th February 2019)
3. GOV.UK *Waste Electrical and Electronic Equipment (WEEE) (2013)* <https://www.gov.uk/government/publications/waste-electrical-and-electronic-equipment-weee-regulations-individual-producer-responsibility-ipr-in-a-uk-context> (Accessed Online Wednesday 6th February 2019)

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6. GOV.UK *Waste Electrical and Electronic Equipment (WEEE) (2013)* <https://www.gov.uk/government/publications/waste-electrical-and-electronic-equipment-weee-regulations-individual-producer-responsibility-ipr-in-a-uk-context> (Accessed Online Wednesday 6th February 2019)

5.0 Appendix 1 – UWE Interviews

Wednesday 27th Feb 2019 – UWE Environmental officer.

The environmental officer understanding of the UWE computer waste management strategy is that the UWE provide an assorted collection of end of life computers systems inventory tracked by I.T. accompanied with the required disposal documentation (transfer of care notification) to a carefully selected and regulated specialist third party company.

Once the systems have reached the specialist, they completely wiped of any UWE information and identification with the hard drive destroyed. Once the UWE has written confirmation this process has been, conducted in accordance with its sustainable disposal procedures the specialist can conduct a condition assessment to ascertain the credibility of the system being upcycled and sold on with a share of this processes returned to the UWE in some agreed form.

Friday 1st March 2019 – UWE Intelligent building IT systems engineer.

The Intelligent building systems engineer understanding of the UWE computer waste management strategy is similar to that described by the environmental officer in that the UWE provide an assorted collection of end of life computers systems inventory tracked by I.T. accompanied with the required disposal documentation (transfer of care notification) to a carefully selected and regulated specialist third party company.

Once the systems have reached the specialist, they completely wiped of any UWE information and identification with the hard drive destroyed. Once the UWE has written confirmation this process has been, conducted in accordance with its sustainable disposal procedures that is where it ends. The specialist is not then obligated to provide a share of any proceeds made from the systems being upcycled and sold on because the agreement is the specialist collects, wipes and destroys the hard drives at no charge to the UWE (Usually a chargeable process) in return for them recycling what they can and selling on for further use.

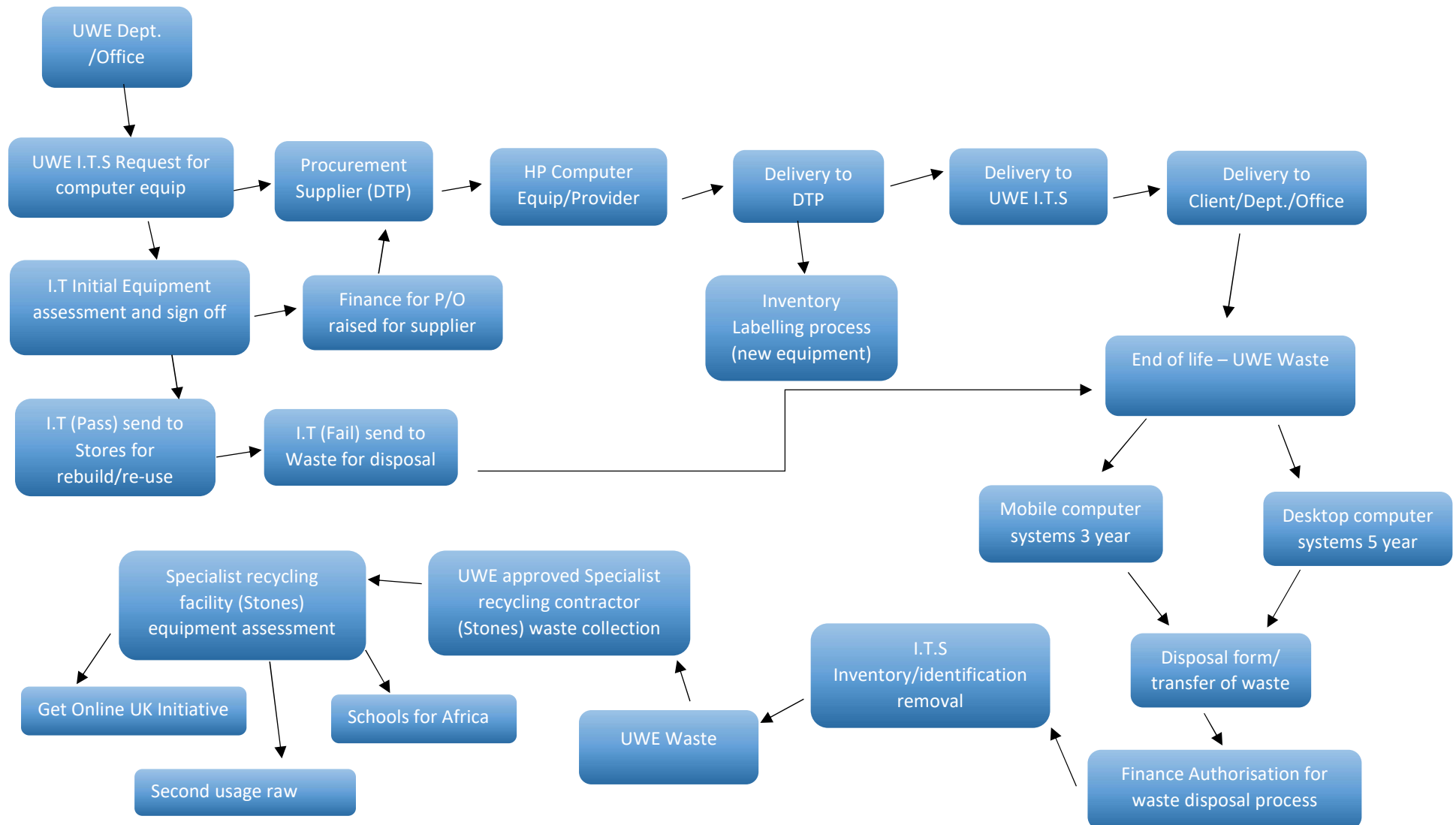
Wednesday 6th March 2019 – UWE Sustainability and waste representative

The understanding of the UWE sustainability and waste representative is similar to that described by the environmental officer in that the general process is I.T conduct bulk exchanges for new computer purchase from a centralised refresh budget used to fulfil providing computer equipment obligations across the campus such as learning spaces or high usage areas. Other UWE departments will generally refresh their own computer equipment with their own budget.

One of the main problems with this strategy is that computer equipment could inevitably be being either replaced early or later falling outside the general lifecycle parameters currently in place for UWE.

6.0 Appendix 2 – Process Map – (Detail Relating to UWE Computer equipment case study)

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7.0 Appendix 3 - UWE Recycling Collections

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Booking In Date	Day	Customer	Job Number	TFT	TFT TV	PC	All in One	LAPTOP	Printers	CRT TFT	Projector	Thin Client	Switch	HDD
07/08/2017	Mon	UWE	6016382	117	6	375	3	53		1		4		45
31/10/2017	Tues	UWE	6017171	130									84	151
23/01/2018	Tues	UWE	6017675	340	12	268	4	44	1		1	1		4
09/05/2018	Weds	UWE	6018389	126	9	422	1	5	6	10	5			
			Total	713	27	1065	8	102	7	11	6	5	84	200
			Weight (Kg)	7.5	20	7	12	3	21	15	6	5	5	0.5
			Total Weight (Kg)	5347.5	540	7455	96	306	147	165	36	25	420	100

8.0 Appendix 4 – Project Questions and Stone responses

Richard Black

From: Martin Ruston <martin.ruston@stonegroup.co.uk>
Sent: 29 March 2019 09:14
To: Richard Black
Cc: Zoe Hill
Subject: Project Questions
Attachments: Stone Recycling Recovery Map.pdf

Hi Richard,

Zoe has passed on your request for information to help with your studies. I have provided some answers below, I hope this helps.

1. What is the final destination and or use of the secondary raw material gained from the shredded items? i.e. Circular economy process if zero goes to landfill. You mentioned the use of a Broker?

See attached Waste plan which will give you some idea of the various processors we pass materials onto for further recycling. We cannot be certain where these materials finally end up, as there will be many processors involved before these materials are finally re-smelted into raw materials. You will note though that we only pass materials to approved facilities.

2. Would you be able to provide approximate quantities/weights (kg/tonnage) including what the average costs are for the sale of this waste in relation to the minimal waste you sell to the broker for further usage?

Pricing for waste materials (those which attract a rebate- typical metal wastes) will vary dependent on the market at the time.

Recent rebates that we have received - Non ferrous shredded mixed metals - £100/Tonne Bulk mixed scrap metal - £85/tonne Plastic shred mixed - Costs approx. £120 for processing
Copper / Brass streams - £500 / Tonne

3. Schools for Africa – does that mean Stones pass responsibility and any associated liability for this computer (e-waste) to Africa whereby it becomes their duty to manage the waste at end of life?

The charity IT Schools Africa who receive a small donation each month of working refurbished equipment, allocate the equipment to schools in Africa which they support. They will take responsibility for the disposal of this equipment when it becomes end of life (Waste)

4. Prior to sending refurbished computer equipment out to Africa which I assume is almost a last resort what other avenues and initiatives are utilised by Stone?

The vast majority of our refurbished equipment is sold into the secondary market within the UK – this is done via our online Reurb site 'Encore' , E bay, Amazon, directly to schools by our sales teams and in bulk to IT brokers for resale.

5. Finally how Stone see the circular economy developing with the service they can offer existing and future clients?

The circular economy around IT equipment has been a well developed sector for many years – it will continue to grow and ongoing growth of the Stone Recycling service is part of the current strategy.

Regards,

Martin Ruston

RISK & COMPLIANCE MANAGER



Stone Group

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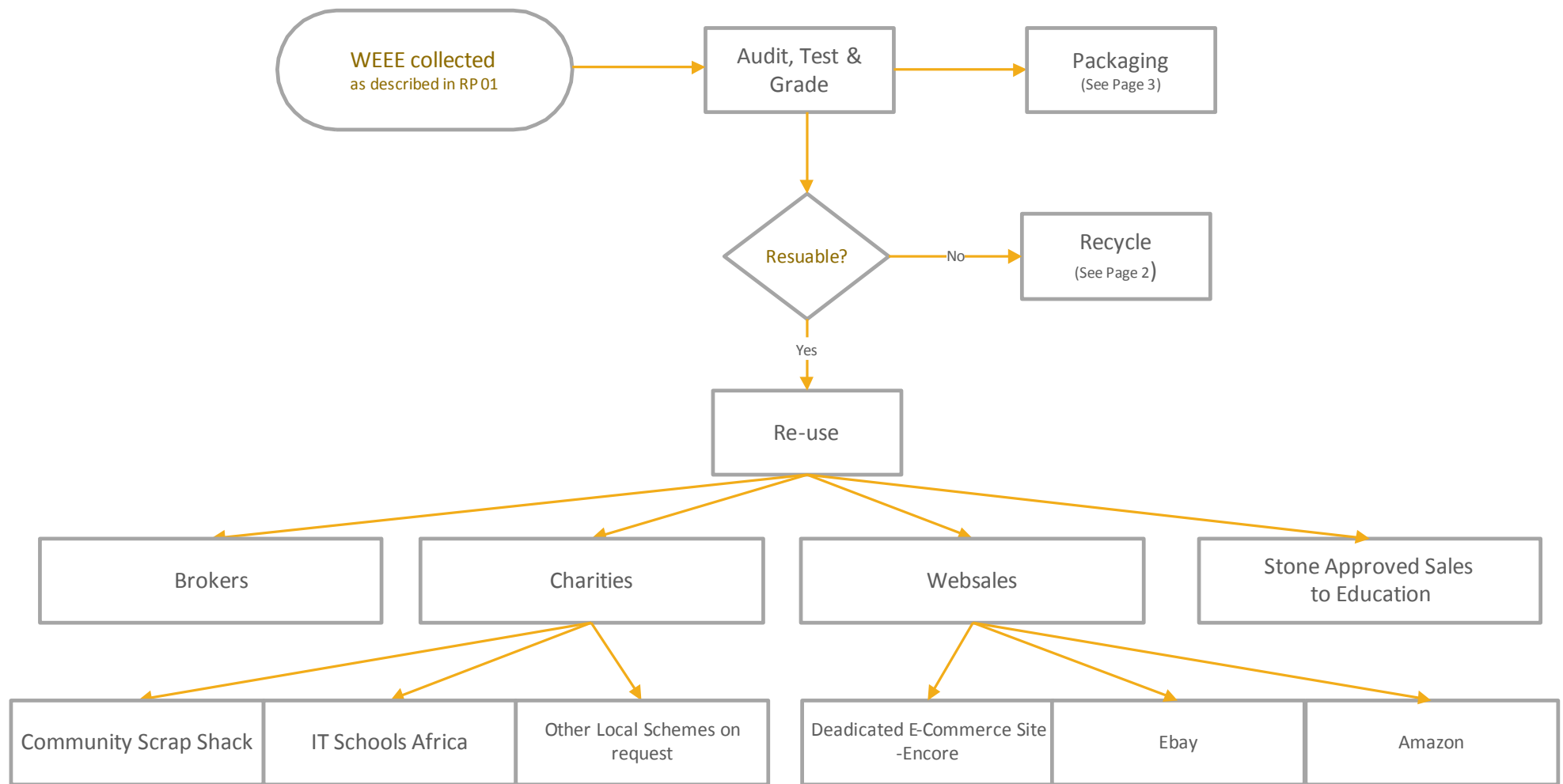
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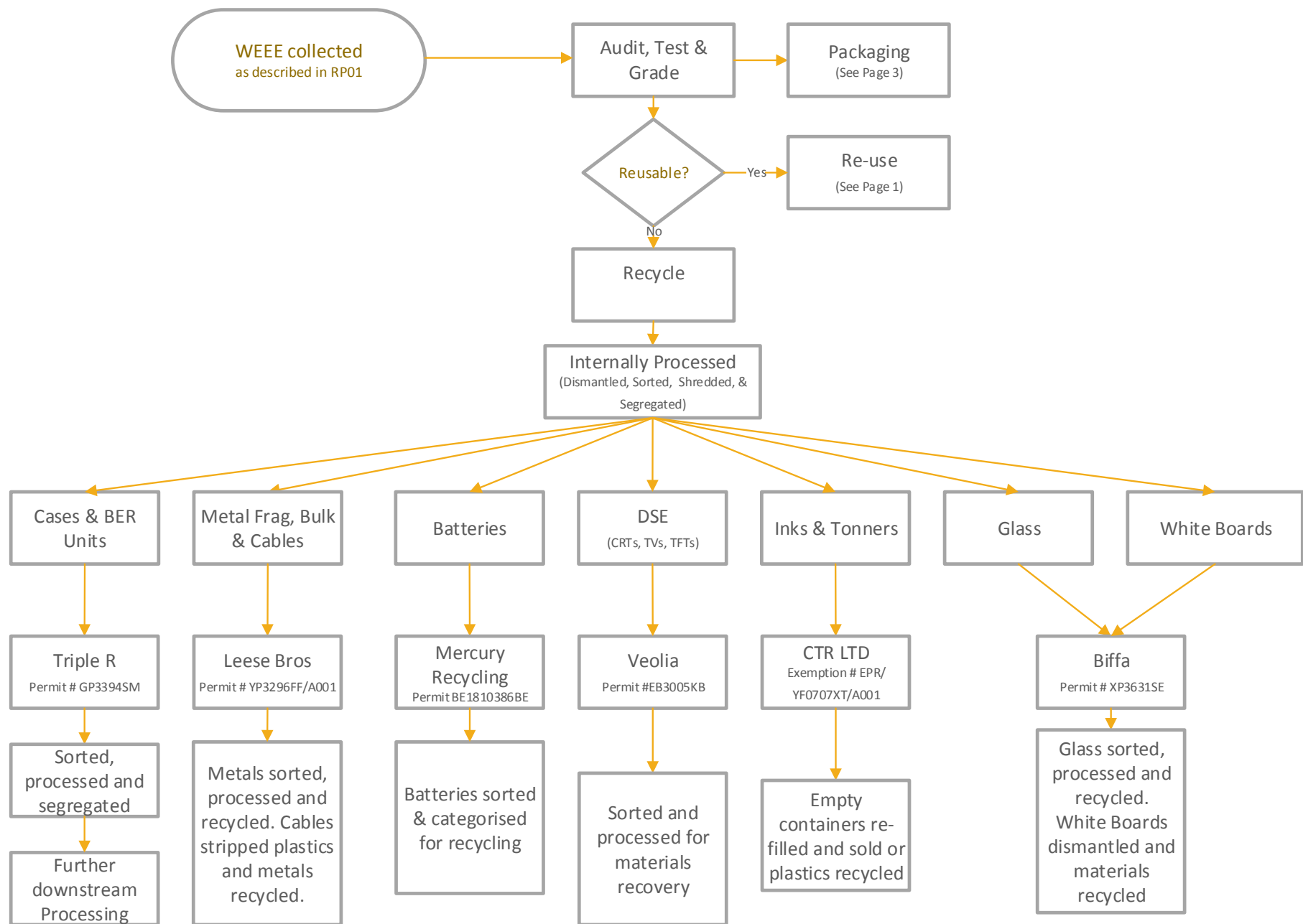
9.0 Appendix 5 – Stones Process maps

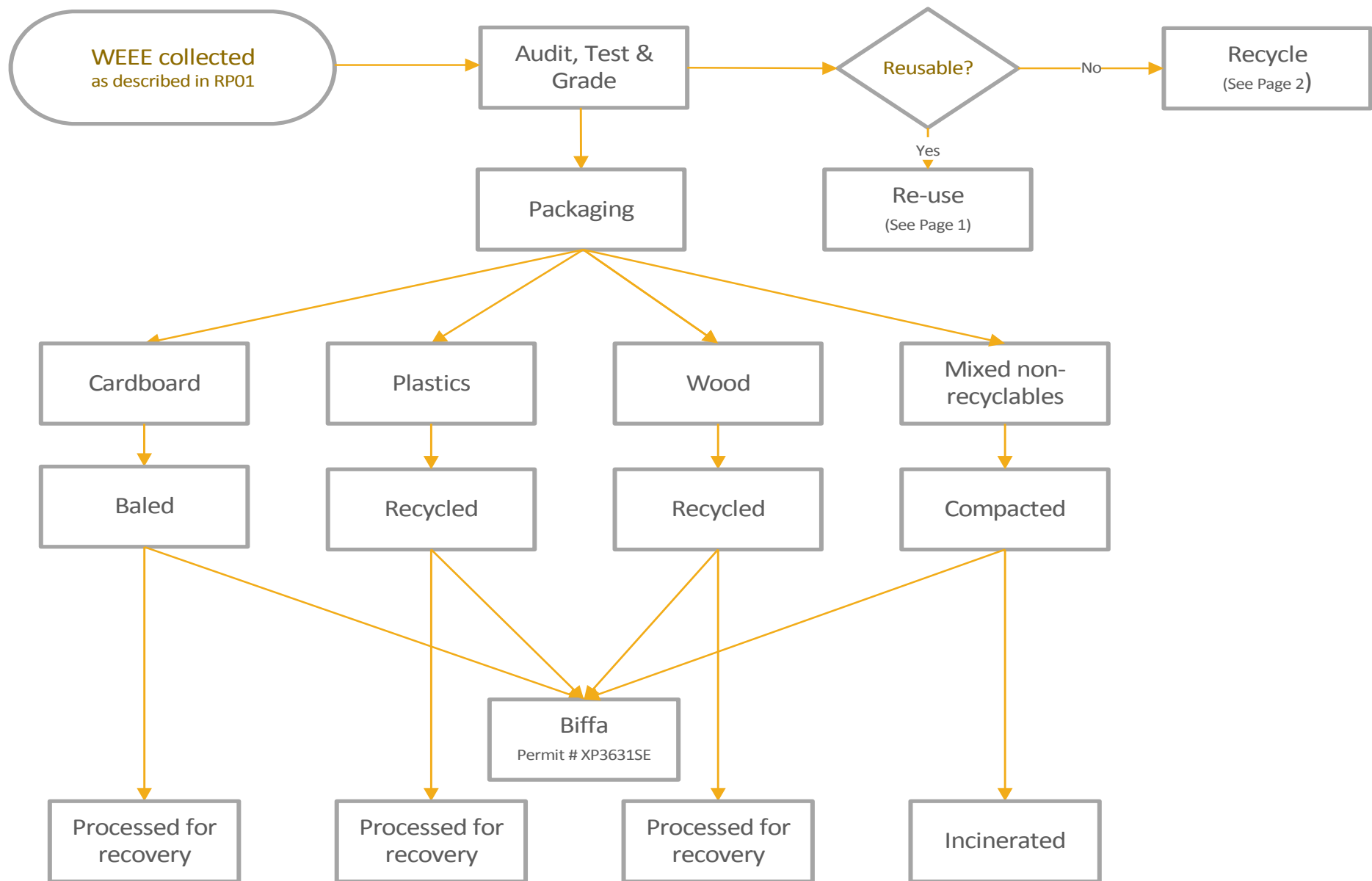


Stone Materials Recovery Map

The following flows detail the processes utilised by Stone for all WEEE received. The waste streams created are routed through detailed processes/approved facilities which ensures WEEE processed by Stone is not sent to landfill and the recovery of recyclable materials is maximised, in line with the Waste Hierarchy.







10.0 Appendix 6 - Stones recycling facility - 360° Tour YouTube video

<https://youtu.be/EMZfNiX55q4>