



UK EEEFlow 2018

Update Report

Dr Hugh McCoach & Dina Thain

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Table of contents

1	Introduction	2
2	Objectives	2
3	Methodology	3
4	EEE Placed on the Market.....	4
5	WEEE off the Market	5
6	Compliance Assessment	6
6.1	Projections	6
6.2	Compliance Assessment.....	6
7	Compliance Conclusions	9
7.1	EU Target Compliance.....	9
7.2	Draft 2018 UK B2C Target Assessment	10
7.3	Recommendations for Future Work	11

Table of Figures

Figure 1	EEE POM Results & Methodology Summary.....	4
Figure 2	WEEE off the Market.....	5
Figure 3	Compliance Against EU Targets Based on POM Across Previous Three Years	7
Figure 4	Comparing Projected 2019 Compliance Against Both EU Target Methodologies.....	8
Figure 5	Draft 2018 UK B2C Target Assessment	10

1 Introduction

The original UK EEEFlow 2016 report was published in February 2017. Using a baseline year of 2015, the work was conducted to provide a better understanding of flow of EEE onto the market and WEEE off the UK market (and projected flows for each) to help inform the UK Government and other stakeholders on the implications of achieving compliance with recycling targets. Targets and known changes to legislation include:

- In 2017, the UK was required to meet a 45% EU target to comply (based on previous three years' EEE sales);
- In 2019, the target increases and the way in which the target is derived could also change, with two options laid out as either 65% of EEE sales (average of previous three years), or 85% of WEEE generated; and
- Changes in the scoping of EEE in 2019, which may impact recycling.

Although it is only approximately a year since the original report was published, there were some significant changes in the sector, meaning it required updating. The UK EEEFlow 2016¹ report predicted that reported WEEE recycling would increase through to 2020; however, since mid-2016, the Reported WEEE recycling has been on a downward trend. This means that, going forward, it could be increasingly difficult to set appropriate targets unless they are revised accordingly, in-line with new data.

This work also aimed to identify additional pieces of work that could be commissioned to increase the confidence of recycling estimates and further increase the accuracy of Reported and Unreported recycling (see Section 7.3). This is in addition to the work that has already been conducted in the past year, namely: 'Study on Illegal WEEE Thefts from DCFs' and 'Study on Unreported Treatment of Waste Electrical and Electronic Equipment (WEEE)', which were not published at the time of writing.

2 Objectives

Valpak has updated the UK EEEFlow 2016 report to provide an updated target compliance assessment based on up to date published EEE placed on the market (POM) and WEEE recycling data. Due to the original UK EEEFlow 2016 methodology being approved by key industry stakeholders within the past year, the methodology used for estimating EEE POM and WEEE recycling has been kept the same. However, the work was updated with new available data, and where possible, up to date market intelligence from key industry stakeholders.

This updated report uses a similar format to the previous report. It identifies baseline flow estimates, and then based on these, makes projections to assess future compliance. The updated project objectives were to:

- Quantify 2017 EEE and WEEE flow figures;
- Make projections of EEE and WEEE flow up to 2020;
- Help inform 2018 B2C target setting; and
- Assess compliance with future targets.

¹ https://www.valpak.co.uk/docs/default-source/information-zone/uk-weee-flows-final_publish.pdf?sfvrsn=e95b6d10_2

3 Methodology

UK EEEFlow 2018 (Update Report)

This update uses the same methodology for estimating EEE and WEEE placed on the market (and projections) as the original UK EEEFlow 2016 report. This is combined with new published data and key industry stakeholder intelligence to update the original compliance assessment. The methodology involved:

Phase 1

- Reviewing the UK EEEFlow 2016 model and report to identify areas that could be updated;
- Reviewing published reports and data to identify where updates were available; and
- Engaging key industry stakeholders (where necessary) that provided data/market intelligence during the original work to obtain an update.

Phase 2

- Quantifying the flow of EEE onto and WEEE off the UK market (by category) for a baseline year of 2017;
- Making projections for future flows of EEE and WEEE up to 2020;
- Assessing the possible compliance issues as a result of:
 - Changes to the scoping methodology in 2018 coming into effect in 2019;
 - Potential changes to the classification of some equipment;
 - 2018 and 2019 targets; and
- Conducting scenario analysis for meeting targets.

The original UK EEEFlow 2016 report and accompanying methodology can be found in the link below².

Key Industry Stakeholder Intelligence

The UK EEEFlow 2016 report data was reviewed to identify any market intelligence that could require updating. The stakeholders (including Defra, Recolight, Lighting Industry Association (LIA), Lumicom and the British Toy & Hobby Association) were engaged to review estimates previously provided for Unreported (W)EEE and exempt/unaccounted POM, in addition to reviewing annual growth rates for projecting POM and WEEE to identify if updates were available.

The updates regarding data and market intelligence were incorporated into this update report. The final summary methodology used for this update for EEE/WEEE projections can be found in Appendix I.

² https://www.valpak.co.uk/docs/default-source/information-zone/uk-weee-flows-final_publish.pdf?sfvrsn=e95b6d10_2

4 EEE Placed on the Market

Figure 1 shows the 2017 POM results and methodology summary.

Total	1821k	Total POM from “STUDY ON COLLECTION RATES OF WEEE”, European Commission, October 2014: % applied to 2017 Reported
Total registered	1610kt	EA Data
Total unregistered	71kt	Sum of below
Cat 1 Large Household Appliances	0kt	Negligible - AMDEA (Richard Hughes)
Cat 2 Small Household Appliances	5kt	Nominal 3% of total POM – TechUK
Cat 3 IT and Telecoms Equipment	5kt	Nominal 3% of total POM – TechUK
Cat 4 Consumer Equipment	8kt	Assigned 12.5% of total POM: midpoint between toys and lighting
Cat 5 Lighting Equipment	2kt	Estimated 5% of total POM – Recolight
Cat 6 Electrical and Electronic Tools	14kt	Assigned 12.5% of total POM: midpoint between toys and lighting
Cat 7 Toys Leisure and Sports	3kt	Estimated 5% of total POM – BTHA
Cat 8 Medical Devices	0kt	Assumed negligible
Cat 9 Monitoring and Control Instruments	0kt	Assumed negligible
Cat 10 Automatic Dispensers	0kt	Assumed negligible
Cat 11 Display Equipment	0kt	Negligible - TechUK
Cat 12 Cooling Appliances Containing Refrigerants	0kt	Assumed negligible
Cat 13 Gas Discharge Lamps and LED Light Sources	3kt	Estimated 20% of total POM - Recolight, Lumicom
Cat 14 Photovoltaic Panels	30kt	Feed-in tariff data converted to tonnes 47%
Total exempt / unaccounted	140kt	Sum of below
Toys	2kt	BTHA estimate 2-4% (used 3%) of total POM
Household Luminaires	50kt	Lumicom estimate
Other Unassigned	89kt	Gap between total and all that is already assigned

Figure 1 EEE POM Results & Methodology Summary

This shows that registered POM accounts for 88% of the total POM, with exempt/unaccounted at 8% and unregistered at 4%.

5 WEEE off the Market

Figure 2 shows the 2017 WEEE results and methodology summary.

Total	1545kt	“STUDY ON COLLECTION RATES OF WEEE”, European Commission, October 2014: WEEE Generated 2015
Total Reported	651kt	EA Data
Total Unreported	524kt	Remainder after removing Residual, Cat 12 DCF Diverted and Reported
Category 3 B2B Asset Management	57kt	87% of Reported POM: "Hewlett Packard B2B Asset Management in the UK and France" ³ Aug 2014
LDA in Light Iron	269kt	Stakeholder group, BMRA, Defra
Other Unreported	197kt	Total WEEE minus Reported, Residual, Cat 12 DCF Diverted, B2B Asset Management, LDA in Light Iron
Total Residual	366kt	Sum of below
Residual B2C	356kt	% WEEE in residual waste (average % from compositional analysis studies across UK)
Residual B2B	10kt	Cat 3 only: "Hewlett Packard B2B Asset Management in the UK and France" Aug 2014
Total DCF Diverted⁴	121kt	Sum of below
Cat 1 Large Household Appliances	107kt	50% of Reported hh collected LDA: data assessment. Assumed to be in light iron stream
Cat 2 Small Household Appliances	1kt	2% of Reported hh collected SDA: Valpak intelligence. Captured in Other Unreported
Cat 11 Display Equipment	7kt	14% of Reported hh collected Displays: HP presentation. Captured in Other Unreported
Cat 12 Cooling Appliances	6kt	6% of Reported hh collected cooling apps (components only): WDA variance reports. Not captured in Total Unreported

Figure 2 WEEE off the Market

Although the theft of Cat 2 Small Household Appliances (1kt) and Cat 11 Display Equipment (7kt) is shown individually in Figure 2 in the section ‘Total DCF Diverted’, the Steering Group from the UK EEEFlow 2016 project believed that these material streams would be treated in some way. It is therefore assumed these material streams are included within the ‘Other Unreported’ figure. Also, it is assumed that the theft of Cat 1 Large Household Appliances (107kt) would be sent for shredding in the light iron stream; therefore, the 107kt estimated is assumed to be included within the ‘LDA in Light Iron’ figure. Since the tonnage diverted under Cat 12 Cooling Appliances is assumed to be mostly components, this has not been included within the Unreported element (as with Cat 2 and Cat 11) since it would not be treated as whole WEEE.

³ LRS Consultancy, (2014) Hewlett Packard B2B Asset Management in the UK and France, p3.

⁴ DCF Diverted refers to leakage at Designated Collection Facility (DCF) sites which is likely to be in the form of theft.

6 Compliance Assessment

6.1 Projections

In order to undertake a compliance assessment against WEEE recycling targets, EEE POM and WEEE recycling projections were made up to 2020. Projections for POM were made using registered POM data and applying annual growth rates. Projections for WEEE were made using Reported WEEE collected data and applying annual growth rates. The growth rates and summary methodology for the projections can be found in Appendix I.

6.2 Compliance Assessment

Based on the new data, the assessment of how likely the UK is to meet its national compliance targets was updated. This section details the results of the assessment.

The Targets

In 2017, the UK was required to meet a 45% target to comply (based on previous years' EEE sales). In 2019, the UK is required to collect WEEE of at least 65% of average previous three years' EEE sales, or 85% of WEEE generated in the same year.

The Government can use various data sets to measure the country's performance against those targets. It is not restricted to using Reported WEEE data only. Article 16.4 of the Directive states the following:

"Member States shall collect information, including substantiated estimates, on an annual basis, on the quantities and categories of EEE placed on their markets, collected through all routes, prepared for re-use, recycled and recovered within the Member State, and on separately collected WEEE exported, by weight."

It is therefore clear that the UK Government is able to use substantiated estimates for WEEE it knows is collected and properly treated outside of the current WEEE recycling reporting system to help count towards target compliance. This section presents the results of the assessment of the projected performance against the targets.

Figure 3 illustrates the results of the actual Reported (2017), substantiated estimates (2017 & 2019) and projected recycling (2019) against the national targets for 2017 and 2019 based on previous year EEE sales (average of previous three years).

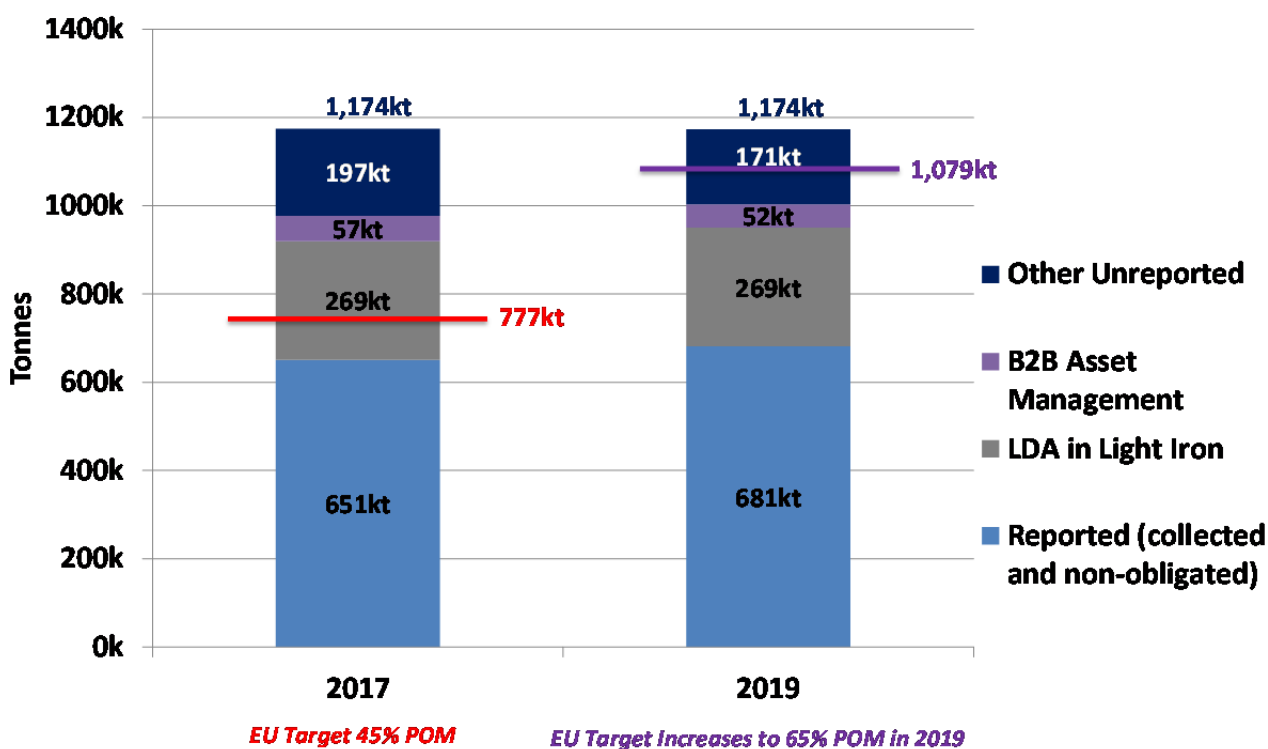


Figure 3 Compliance Against EU Targets Based on POM Across Previous Three Years

The red/purple lines on each stack in Figure 3 show the target in tonnes based on the Directive targets, as described above. The stacks illustrate how the UK is projected to perform, based on both projected Reported data and the Unreported collected figure estimated in this work.

In 2017, the figures suggest that the UK has complied with the Directive target if the LDA in Light Iron figure is included as a substantiated estimate.

The 2019 EU target is now projected to be 123kt lower than the original UK EEEFlow 2016 report. This means the UK can potentially be compliant by including other substantiated estimates, which include all the LDA Light Iron and Cat 3 B2B Asset Management together with 76kt (44%) of Other Unreported recycling. Similarly, another option would be to recover 76kt (21%) of WEEE from the Residual waste stream, or a combination of the two. It should be noted that two studies commissioned as a consequence of the UK EEEFlow 2016 report, namely: ‘Study on Illegal WEEE Thefts from DCFs’ and ‘Study on Unreported Treatment of Waste Electrical and Electronic Equipment (WEEE)’, may increase the confidence in a proportion of the Unreported recycling to help reach the target. The decrease in the target in 2019 has resulted from the decline in EEE placed on the market in 2017 because the EU target is calculated using POM averaged over the previous three years.

Figure 4 has been included to compare the gap between projected levels of WEEE collections against the two alternative 2019 EU targets. The left-hand side demonstrates compliance against the 2019 target based on 65% of average EEE sales from the previous three years, whereas the right-hand side demonstrates compliance against the 2019 target based on 85% of WEEE generated in that year.

For each target, the figures from the original UK EEEFlow 2016 report have also been included alongside the updated projections from this report to show the impact of the change in targets due to the change in data.

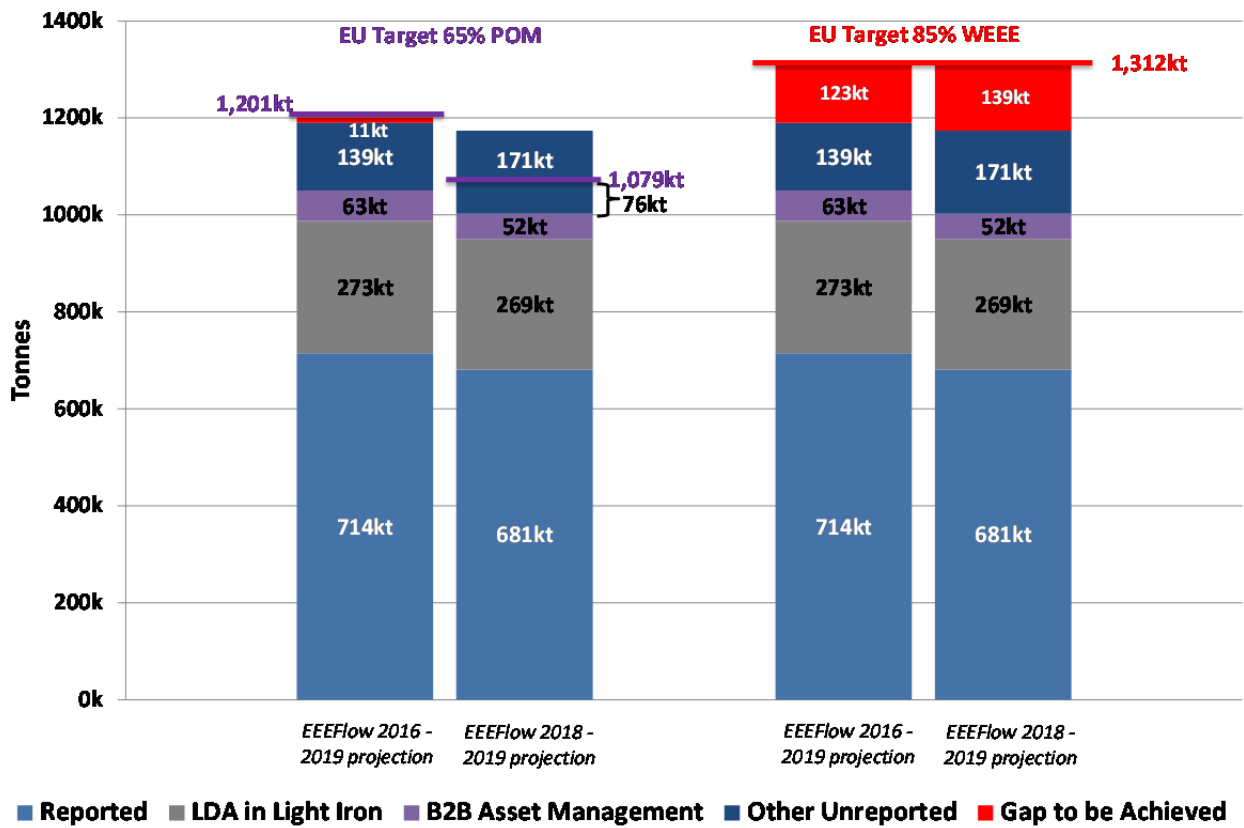


Figure 4 Comparing Projected 2019 Compliance Against Both EU Target Methodologies

The red blocks in Figure 4 illustrate what is required to close the gap between the potential 2019 EU targets, and all projections made.

This shows that the challenge of complying with the EU target, based on the 85% of WEEE generated methodology, is significantly greater than if the target is based on 65% of average EEE sales in the previous three years methodology (as shown in Figure 4).

In 2019, the UK will need to find an extra 76kt of WEEE to recycle if it is to meet the Directive target of 65% of EEE sales in 2019, and if Other Unreported recycling is not considered suitable to include towards substantiated estimates. This implies an incremental increase of 38kt per annum from 2017. If the UK is required to meet the Directive target of 85% of WEEE generated in 2019 (if the Government opt for this option), an additional 139kt will need to be found.

7 Compliance Conclusions

7.1 EU Target Compliance

Including the substantiated estimate for LDA in Light Iron will enable the UK to comfortably comply in 2017 with the Directive WEEE collection target of 45% (based on % of average weight of EEE placed on the market in the three preceding years in the UK).

If Reported data were to be used alone, then the figures would suggest that the UK would not comply in 2017. However, by including the substantiated estimate for LDA in Light Iron only, the UK would exceed the required POM target by 18%.

In 2019, the UK could meet the requirements for the EU POM target if it includes all substantiated estimates in this report (namely LDA in Light Iron, Cat 3 B2B Asset Management and Other Unreported).

In order to achieve a 65% of EEE sales target, the UK will need to collect 1,079kt of WEEE in 2019. However, only including projected Reported tonnage together with estimates of additional tonnage in which we have a high degree of confidence, namely LDA in Light Iron and B2B IT Unreported treatment, will see the UK achieve a collection tonnage of 1,003kt. If there is a sufficient level of confidence in 44% of the Other Unreported tonnage (76kt) to allow it to be used as substantiated estimates, then the UK will meet its 2019 target.

Two studies commissioned as a consequence of the UK EEEFlow 2016 report, namely: 'Study on Illegal WEEE Thefts from DCFs' and 'Study on Unreported Treatment of Waste Electrical and Electronic Equipment (WEEE)', may increase the confidence of a proportion of the Unreported recycling which can help the UK achieve the 2019 target.

UK compliance is more achievable in 2019 if the target is based on 65% of EEE POM

If the Government were to adopt a collection target method in 2019 based on 85% of WEEE generated, it would be more challenging for the UK to comply than if the Government were to adopt a target based on the 65% POM data method. The shortage in 2019 is 139kt, based on WEEE generated and using all Reported and Unreported estimates.

7.2 Draft 2018 UK B2C Target Assessment

Figure 5 shows 2017 and 2019 actual Reported and projected recycling in order to show whether draft 2018 UK B2C targets would be a suitable interim target to help move towards achieving the 2019 EU target (based on the projections and analysis above). As outlined in Section 6.2, the 2019 EU target based on POM is achievable by using 76kT (44%) of Other Unreported recycling, providing that Reported recycling is 681kt. As shown in Figure 5, this comprises 546kt of B2C Reported collections, 124kt of non-obligated collections and 11kt of B2B collections.

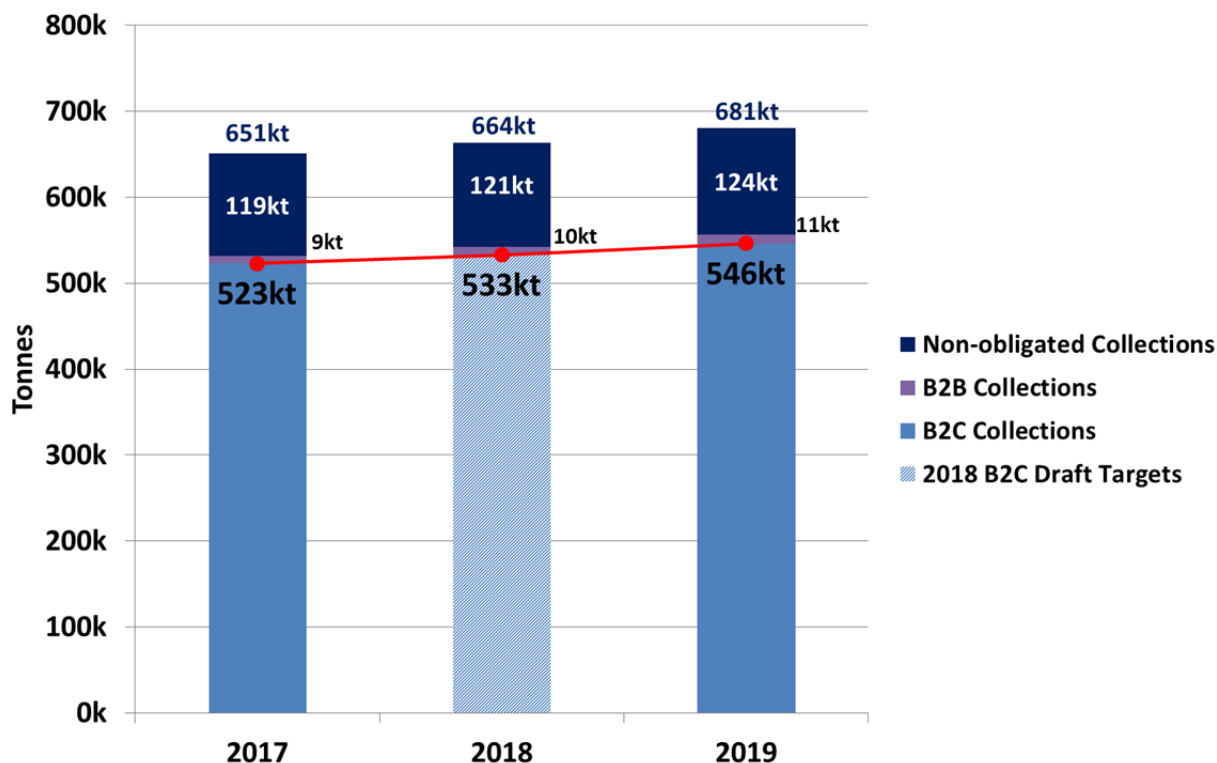


Figure 5 Draft 2018 UK B2C Target Assessment

In order to achieve steady growth towards 546kT of B2C Reported collections in 2019, an overall B2C target of 533kt for 2018 appears to be appropriate.

7.3 Recommendations for Future Work

Further work should be conducted to increase the confidence of recycling estimates and further increase the accuracy of Reported and Unreported recycling

Due to the importance of Reported and Unreported recycling in meeting recycling targets, several projects could be conducted to increase the robustness of recycling estimates. These could include:

- Estimating Unreported reuse: There is a significant quantity of WEEE items sold for reuse by the third sector and commercial operators which is not reported and, as such, not captured within the UK Reported recycling figure. This should be investigated to quantify the extent to which this happens.

Benefit of Work: This would help increase the degree of confidence in a percentage of the Other Unreported recycling and substantiated estimates.

- Quantifying cooling appliances theft and the effect this can have on the large household appliances theft calculation used in this project: The method for calculating large household appliances theft from DCF sites is based on the assumption that the ratio of large household appliances to cooling equipment going onto the market should be approximately the same as that which is coming off. This is due to this stream comprising similar types of items with a similar lifespan. Also, if a large household appliance is bought, it is usually to replace an old/broken item.

Due to the impact the fridge theft estimate can have (based on the way large household appliances theft is calculated) work should be conducted to increase the accuracy of this figure.

Benefit of Work: This would help to support the estimate for cooling theft included in this report as well as supporting the large household appliances theft calculation by further improving its accuracy.

- Assessing how non-obligated WEEE is identified and reported by AATFs: During discussions with AATFs it has been identified that some AATFs may be incorrectly classifying obligated/non-obligated WEEE due to confusion around how to classify it.

Benefit of Work: This could potentially identify if WEEE recycling that is currently being classified as non-obligated recycling should be classified as obligated recycling. This work would also help identify whether there are other issues around non-obligated recycling, such as the potential for double counting recycling; i.e. the same item being recorded as received for recycling by two AATFs.

Further work that should be conducted to increase the confidence of projected recycling

- Detailed (W)EEE projection analysis: This project should analyse different techniques for projecting EEE placed on the market and WEEE collected. This should include looking at the increase in recycling in 2016 and whether this could be considered an anomaly. If this is the case, work could be done to establish the impact that would result from removing these figures from projections. This should be done on a (W)EEE category level and take into account what may have caused the spike in 2016.

Benefit of Work: This would provide analysis on the impact of using differing techniques for projecting WEEE recycling and EEE placed on the market and the effect an anomaly can have. This could potentially help inform future target setting.

Appendix I

Key Industry Stakeholder Intelligence for Estimating EEE/WEEE Projections

Projections – POM

This table shows the annual rate of change in tonnes placed on the market between 2017 and 2020.

Projections	Rate of Change	Projections methodology
Cat 1 Large Household Appliances	Variable	House build projections - 'Industry Insights, Construction Skills Network Forecasts 2017-2021'
Cat 2 Small Household Appliances	0.12%	Historical annual growth rate
Cat 3 IT and Telecoms Equipment	-4.10%	Historical annual growth rate
Cat 4 Consumer Equipment	-6.21%	Historical annual growth rate
Cat 5 Lighting Equipment	7.50%	Recolight 5-10% per annum
Cat 6 Electrical and Electronic Tools	-0.91%	Historical annual growth rate
Cat 7 Toys Leisure and Sports	-1.74%	Historical annual growth rate
Cat 8 Medical Devices	8.39%	Historical annual growth rate
Cat 9 Monitoring and Control Instruments	5.33%	Historical annual growth rate
Cat 10 Automatic Dispensers	-4.07%	Historical annual growth rate
Cat 11 Display Equipment	-11.79%	Historical annual growth rate
Cat 12 Cooling Appliances Containing Refrigerants	1.56%	Historical annual growth rate
Cat 13 Gas Discharge Lamps and LED Light Sources	-8.21%	Historical annual growth rate
Cat 14 Photovoltaic Panels	20.45%	Renewable Energy Association

Projections – WEEE

This table shows the annual rate of change in tonnes of WEEE collected between 2017 and 2020.

Projections	Rate of Change	Projections methodology
Cat 1 Large Household Appliances	Variable	House build projections - 'Industry Insights, Construction Skills Network Forecasts 2017-2021'
Cat 2 Small Household Appliances	6.11%	Historical annual growth rate
Cat 3 IT and Telecoms Equipment	3.26%	Historical annual growth rate
Cat 4 Consumer Equipment	5.11%	Historical annual growth rate
Cat 5 Lighting Equipment	12.5%	Recolight 10-15% per annum
Cat 6 Electrical and Electronic Tools	7.24%	Historical annual growth rate
Cat 7 Toys Leisure and Sports	-5.67%	Historical annual growth rate
Cat 8 Medical Devices	20.34%	Historical annual growth rate
Cat 9 Monitoring and Control Instruments	24.48%	Historical annual growth rate
Cat 10 Automatic Dispensers	1.93%	Historical annual growth rate
Cat 11 Display Equipment	-9.57%	Historical annual growth rate
Cat 12 Cooling Appliances Containing Refrigerants	4.69%	Historical annual growth rate
Cat 13 Gas Discharge Lamps and LED Light Sources	-8.80%	Recolight
Cat 14 Photovoltaic Panels	2.63%	'End of Life Management Solar Photovoltaic Panels'