



ELECTRONIC PRODUCTS RECYCLING ASSOCIATION BC DEPOT COSTING MODEL

JULY 29, 2019

EXECUTIVE SUMMARY

BACKGROUND

EPRA BC engaged BDO Canada LLP (“BDO”) to develop a cost model, which would identify the various cost inputs incurred to operate a collection depot. This model was developed to determine if the collection fee paid to the depots adequately supports the costs of collecting and handling of the end of life electronic products.

SCOPE & APPROACH

This report focuses on an assessment of the costs incurred by BC depots to collect and handle end of life electronics (“EOLE”). While BDO aimed to incorporate information related to direct costs as well as relevant portions of overhead, the following limitations were present:

- ▶ Participation
 - There were limited respondents from the Depots and Recycling Facilities that were willing and able to participate in the in-depth analysis dimension of the engagement and provide the relevant information required to extrapolate data. The general survey, however, did get participation of 32 respondents, and corroborated the in-depth sample findings.
- ▶ Comparison of subjective data
 - Information collected and provided by participants from the various depots may not always result in comparable and accurate data (for example, much of the activity-based costing is an estimate provided by recycling facilities, given they have not undertaken such analysis themselves).

The primary objective of the engagement was to perform a review of the current EPRA-developed cost model, conduct market research, identify the various costs to run collection depots, and determine if the collection fee paid to the depots adequately covers their costs of collecting and handling end of life electronic products. It should be noted that in reference to the selected depots below, the intent was to select recycling depots in which it was most likely to obtain a response. EPRA identified the depots that would be inclined to participate with an in-depth review and assisted in reaching out to and gaining the cooperation of the depots who participated.

To perform the assessment and meet the objectives listed above, BDO applied the following approach:

- ▶ Conduct preliminary meetings with EPRA project team to gain a more detailed understanding of the current compensation model and data collected by EPRA to date;
- ▶ Conduct on-site visits with a selection of three BC depots to visualize operations and space dedicated to end of life electronics.
- ▶ Conduct interviews with a selection of five BC depots to gain a detailed understanding of end of life electronics operations and associated direct and overhead costs;
- ▶ Obtain and review existing documentation, including relevant time-motion studies and financial information (where available);
- ▶ Evaluate current compensation against identified costs;
- ▶ Develop a proprietary depot costing model, with write-up covering methodologies and assumptions based on the data collection and research conducted;
- ▶ Run scenario analyses on the depot costing model to determine margins at depots given varying cost assumptions; and
- ▶ Validate any applicable findings observed and potential recommendations with management.

CONCLUSION

Our cost model evaluated the ability of a recycling program to cover their program's direct costs as well as contribute in a reasonable manner to overhead expenses. The cost model generated by BDO (BDO Base Case) assumed an average overhead cost per tier (with depots tiered by weekly skid volumes), limited by a maximum overhead threshold, as well as space and labour assumptions arising from either survey information, relevant time motion studies, interviews, or market research.

Our on-site and interview research highlighted that many depots and recycling facilities acknowledged that although they do not believe the program generates a significant profit, there are many benefits to having EPRA's EOLE program other than the compensation and that the program added value to their facility.

Despite the impressions of the facilities mentioned above, the BDO Base Case resulted in an average positive gross margin of 64.4% and a contribution margin (after overhead) of 52.3%. Overall, depots seeing volumes of 2 or more skids per week (in our analysis, "Tiers" 1 through 3) seem to maintain robust margins, whereas Tier 4 (less than 2 skids per week) and Single-Sort depots on average receive revenue that covers their direct costs but may not entirely cover an overhead assumption and therefore these depots experience modestly negative contribution margins.

In light of the fact that our contribution margin calculation includes absorption of overhead (including staffing, insurance, accounting, legal, utilities, etc.) and essentially omits only interest and income tax costs, we conclude that the EPRA compensation for electronics handling at the majority of depots is adequate relative to their costs.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	3
BACKGROUND	6
SCOPE.....	6
APPROACH	6
RESEARCH & DATA COLLECTION	7
COSTING MODEL	11
KEY OBSERVATIONS AND FINDINGS	15

BACKGROUND

Electronic Products Recycling Association (“EPRA”) manages regulated electronics recycling programs, referred to as Extended Producer Responsibility (“EPR”) programs, across Canada. EPR-based collection programs are government-regulated, and serve the purpose of holding industry accountable for managing the end of life of their products, including recycling of the products. Through these programs, EPRA has reduced the amount of old electronics that end up in Canada’s landfills each year, with improved performance every year.

Provinces and territories have developed their own guidelines and policies around these programs, making each area unique. In B.C., EPR programs must outline their desired operations within a Program Plan, referred to as an “EPR Plan”, which the Ministry of Environment (“MoE”) approves. Within the Producers Paying the Cost of Managing Obligated Materials and Dispute Resolution 2018, the MoE has provided producers and agencies with direction on the expectations that the Ministry has when it comes to the EPR plans. On occasion, the MoE may request further undertakings for EPR plans.

The MoE recently requested that EPRA B.C. undertake a review of the remuneration to depots and the cost of depot operations to ensure that EPRA’s EPR plan adequately provides for the producer collecting and paying the costs of collecting and managing products within the product category.

EPRA B.C engaged BDO Canada LLP (“BDO”) to assist in the development of a cost model to assist with determining an approximate cost of depot operations, which through identifying the various costs being incurred to run collection depots can determine if the collection fee paid to the depots adequately covers their costs of collecting and handling end of life electronic products.

SCOPE

This report focuses on an assessment of the costs incurred by BC depots to collect and handle end of life electronics (“EOLE”). While BDO aimed to incorporate information related to direct costs as well as relevant portions of overhead, there were limitations to acknowledge including the following:

- ▶ Participation
 - There were limited respondents from the Depots and Recycling Facilities that were willing and able to participate in the in-depth analysis dimension of the engagement and provide the relevant information required to extrapolate data. The general survey, however, did get participation of 32 respondents, and corroborated the in-depth sample findings.
- ▶ Comparison of subjective data
 - Information collected and provided by participants from the various depots may not always result in comparable and accurate data (for example, much of the activity-based costing is an estimate provided by recycling facilities, given they have not undertaken such analysis themselves).

APPROACH

The primary objective of the engagement was to perform a review of the current EPRA-developed cost model, conduct market research, identify the various costs to run collection depots, and determine if the collection fee paid to the depots adequately covers their costs of collecting and handling end of life electronic products. It should be noted that in reference to the selected depots below, the intent was to select recycling depots in which it was most likely to obtain a response. Due to the scope restrictions noted above, EPRA assisted in the selection process of participating depots.

To perform the assessment and meet the objectives listed above, we applied the following approach:

- ▶ Conduct preliminary meetings with EPRA project team to gain a more detailed understanding of the current compensation model and data collected by EPRA to date;
- ▶ Conduct on-site visits with a selection of three BC depots to visualize operations and space dedicated to end of life electronics.
- ▶ Conduct interviews with a selection of five BC depots to gain a detailed understanding of end of life electronics operations and associated direct and overhead costs;
- ▶ Obtain and review existing documentation, including relevant time-motion studies and financial information (where available);
- ▶ Evaluate current compensation against identified costs;
- ▶ Develop a proprietary depot costing model, with write-up covering methodologies and assumptions based on the data collection and research conducted;
- ▶ Run scenario analyses on the depot costing model to determine margins at depots given varying cost assumptions; and
- ▶ Validate any applicable findings observed and potential recommendations with management.

Our approach assessed:

- ▶ Direct costs incurred to run the EPRA program at a sample of BC collection depots;
- ▶ Differences and gaps in compensation compared to identified costs; and
- ▶ The adequacy of compensation provided to depots for collecting and handling end of life electronics.

RESEARCH & DATA COLLECTION

ON-SITE VISITS

BDO conducted on-site visits to a sample selection of three BC depots, as selected by EPRA. The depots visited included a for-profit depot, a regional recycling depot, and a non-profit recycling depot within urban and sub-urban areas.

During the on-site visits, BDO conducted a tour of the operating facilities and gained a detailed understanding of the processes and staff required to collect, handle, and store end of life electronics, as well as visually identify the space required around and for each pallet or skid and e-bag.

BDO enquired about further information relating to the number of staff required depending on seasonality and other variables, as well as cost information related to rent (where applicable), wages and other overhead expenses.



BDO observed EOLE received in two ways: staff collected items from the consumer either at their vehicle or off a holding tray; or consumers sorted items into the e-bag or near a skid. In both cases, attention to contamination (e.g., placing products in the wrong receptacles or disposing of products that could not be recycled under the program) was clearly a priority, requiring staff to monitor the receiving and sorting process.

BDO observed various methods to build or process a skid and e-bag. Staff build the skids for large customized items and then shrink-wrap them to contain items safely. Some participating depots indicated that

they left items on the ground until staff could configure items safely on the skid. E-bags require less attention to safety for staff, due to the structure of the bag and the smaller size of the items.

Once an e-bag is full, staff transfer them to the storage area, where bags may be stacked prior to pick up. Skids, due to their unconventional size, are not stacked. Some depots add a label on each skid and bag at this time.

On pick-up day, staff use a forklift or hand lift to move the stored materials from one location within the depot to the loading station, where EPRA staff load or assist in the loading of the materials on the truck.

For all depots observed, it was noted that the staff that are assisting in receiving, processing, and storage processes for EOLE are also assisting with other EPR programs, and that no single staff member is dedicated solely to processing EOLE. There is usually only one member of staff assisting in the EPR programs; however, stacking and wrapping of skids requires two members of staff for safety reasons.

It was also observed that EOLE storage can be located outside (in a sheltered area) to reduce space allocated within the facility's warehouse; however, electronics with a hard drive or that have memory / storage must be in a locked area for privacy and confidentiality purposes.

INTERVIEWS

BDO conducted interviews with a sample selection of five BC depots, as selected by EPRA. The depots interviewed included:

- ▶ Three for-profit (bottle or return-it) depots;
- ▶ A single-sort non-profit recycling depot; and
- ▶ A regular non-profit recycling depot.

The depots interviewed represented urban, sub-urban and rural regions.

BDO enquired upon areas including:

1. An overview of the facility's operations in general;
2. The operations of collection and handling of EOLE;
3. The location and space of the facility as well as the space and location of collecting and storing EOLE;
4. Resourcing at the facility as well as specific staffing and skill requirements for handling EOLE;
5. Approximate time taken to perform the tasks necessary to handle EOLE;
6. Equipment used at the facility and estimated allocation of equipment time for the EOLE program;
7. Costs related to space, staff and other overhead;
8. Perceived and realized benefits from offering the program; and
9. The depot's overall perspective of the program value and compensation.

It was found that most depots believed that offering EPRA’s EOLE program has generated benefits and / or that it is a valuable addition to their facility for reasons including:

Benefits Cited By Depots:



Four out of the five interviewed depots communicated a financial benefit from the EOLE program, either through the direct compensation received, or indirectly through the increase of volume resulting from offering the EPR programs available at their facility. It was also noted that although the depots may not be generating a significant profit from the program directly, the depots noted that the compensation was covering the associated costs.

The interviewees mostly noted that although they were receiving some financial incentives, they would benefit from an increase in the compensation provided, mostly due to the increasing costs of labour each year. It was noted that recycling depots are locked into 5-year agreements with the stewardship programs with little room for negotiation related to inflation.

Depots also communicated that additional risks were identified from offering the EOLE program, including those related to break-ins and theft. The depots are required to manage a locked storage area for specific items and this has been a target for criminals in specific locations. Some depots had invested in increased security systems, including cameras, security guards and alarm systems to help reduce the risks; however, the depots did note that these systems benefited the depot as a whole and were not solely for the purpose of EPRA’s program.

It was noted that the depots felt that stacking of units that are collected on skids required an additional member of staff. In addition, prior to stacking units, the space required to collect materials took up a greater footprint until there were enough units to stack and shrink-wrap. This was incorporated into the model.

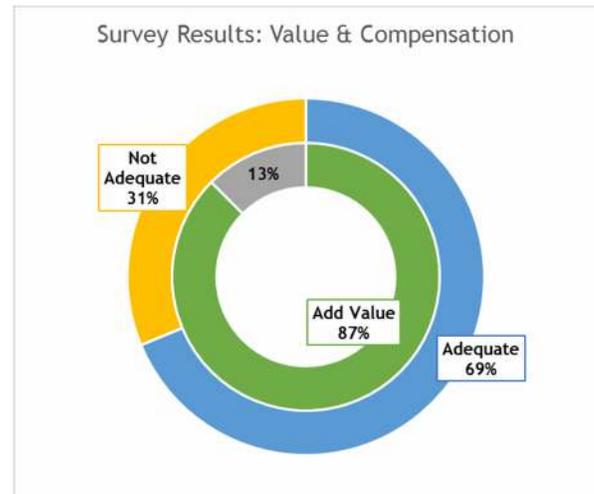
SURVEY DATA

BDO assisted EPRA with the development of survey questions. EPRA distributed the survey to all BC depots collecting end of life electronics. 32 respondents representing 37 depots completed the survey. Survey question topics intended to enhance the quality of individual data collection through quantifiable scales. Topics covered were:

- ▶ Programs offered;
- ▶ Cost of rent;
- ▶ EOLE footprint;
- ▶ Time required to handle collections and storage of e-bags and skids;
- ▶ Average wages;
- ▶ Depots' level of value perceived by the program; and
- ▶ Whether the depots believe the compensation is adequate.

The information collected from the survey noted that 26 out of the 32 depot respondents believe that the EOLE program added value to their depot and 22 out of the 32 either believed that the compensation was adequate or had a neutral opinion on the compensation.

The survey also provided other relevant costing information related to average costs of rent, and average wage amounts, including benefits as well as the time spent for relevant tasks related to the collection and handling of EOLE products. This information was used in BDO's assessment of compensation through the Costing Model, as described later in the report.



COSTING MODEL

BDO developed a cost model focused on quantifying the costs and benefits of the EPRA program from the perspective of the depots involved in the EOLE program, as well as stress testing the overall gross margins and contribution margins under changing cost assumptions. In the following sections, we provide information on the structure and workings of the model, as well as a description of the assumptions that were used to determine the depots' revenues and costs.

MODEL DEVELOPMENT

1) MODEL BUILD PRINCIPLES

The Costing Model contains built-in dynamic features which allow for quick alteration of assumptions related to revenues and expenses, and an immediate re-calculation to see their impact on metrics of interest. The Costing Model was built based on 175 recycling depots located across British Columbia. EPRA provided data including the weight of the recycled materials (CPUs, displays, and other), the number of skids collected per year, the collection frequency, as well as the charge per skid for the 175 depots. This allowed the revenue calculation for each depot, using the following formula:

$$\text{Revenues (\$/year)} = \text{Weight(mt)/year} \times \text{Fee(\$/mt)}$$

The direct costs that were quantified in the model were the following:

DIRECT COSTS	DESCRIPTION	CALCULATION METHOD
Handling Cost	Manual Labor Cost associated with the preparation of the skids, specifically receiving materials, handling, quality control, and paperwork	Handling Cost (\$/year) = Hourly Labour Rate(\$/hr) × Handling Time(hr/skid) × No of Skids
Forklift Cost	Costs associated with the usage of forklifts for unloading supplies and loading trucks. The forklift cost includes embedded Capex & Operating costs, training costs for personnel, as well as the labor cost associated with operating the forklift. All of these costs are summed into an hourly cost associated with the operation of the forklift	Forklift Cost (\$/year) = Hourly Forklift Rate(\$/hr) × Forklift Time(hr/skid) × No of Skids
Space Cost	Costs associated with the space used for storage (items received and packed), collection (receptacles for current collection), and supply (additional receptacles). A yearly average rent/sf is assumed depending on the area where each depot is located: urban, suburban, small town, rural. This rent is assumed even if the building is owned as a proxy for the opportunity cost of the space.	Space Cost (\$/year) = (No of Storage Skids + No of Collection Skids + No of Supply Skids) × Occupied Area(sf/skid) × Rent(\$/sf)

In addition to direct costs, we also considered overhead costs. The overhead costs included management & admin salaries, cleaning & maintenance, office rent, office equipment, accounting & legal, phone & utilities, miscellaneous, software & subscriptions, security, training, and insurance. We estimated overhead based on sample financial statements and/or trial balances from two sample depots. The allocation of overhead to EPRA was determined pro-rata based on the ratio of EPRA revenues to total revenues. A “cap” was subsequently applied based on triangulating this information against other publicly available financial statements and/or common-size statements from companies/organizations that are as closely analogous as possible to the depots in question.

The model also considered an additional category of overhead called Idle Time, which accounts for time that handling (direct) staff are under-utilized. The model estimates Idle Time as a percentage of the

direct labour costs associated with handling the skids.

The financial metrics that we focused on generating were:

- ▶ **Gross Margin:** the depots' net sales revenue minus their direct costs (also expressed as percentage of revenues)
- ▶ **Contribution Margin:** the depots' gross margin minus their overhead costs allocated to the EPRA program (also expressed as percentage of revenues).

2) MODEL STRUCTURE

BDO developed a cost model focused on quantifying the costs and benefits of the EPRA program from the perspective of the depots involved in the EOLE program, as well as stress testing the overall gross margins and contribution margins under changing cost assumptions. In the following sections, we provide information on the structure and workings of the model, as well as a description of the assumptions that were used to build the inputs used in the model to determine the depots' revenues and costs.

The Depot Cost Model has the following structure:

1. Model Dash

The Model Dash offers an overall picture of the revenues and costs by depot type (based on depot tier, location type, business type, etc.). The Model Dash also shows a more detailed overview of the cost and revenue structure for each depot. A dropdown menu is available for selecting an individual depot.

2. Model Inputs

The Model Inputs tab contains a list of the main assumptions that go into the model (on an average basis), as well as a scenario testing section, with a built-in scenario storage mechanism. These inputs are fed into the Depot Model tab, for detailed calculation. The main categories of assumptions are:

- ▶ **Revenues:** this section contains inputs on the revenues per pallet and revenues per e-bag displayed in (\$/mt).
- ▶ **Labour Costs:** this section is broken down into two main types of labour associated with sorting and packing the recycled skids: manual labour used for handling the skids, and forklift labour. The user can specify both the hourly rate and average duration per skid for each type of labour.
- ▶ **Space Costs:** this section contains inputs for the costs associated with the space required to store and collect the skids used in the EPRA program. A space of 16 sf is assumed to be needed for each skid, and the cost/sf is an average based on the location type for the depots: urban, suburban, small town, rural. The average space needed for each depot is quantified based on tiers (Tier 1, Tier 2, Tier 3, Tier 4, and Single-Sort), which are related to the volume of skids collected on average for each facility.
- ▶ **Overhead Costs:** this section contains inputs related to the overhead costs required to run the depot and the portion of overhead that is allocated specifically to the EPRA program. We also consider a special category called Idle Time, which is associated with the time that the personnel dedicated to performing direct labour for the EPRA program and other programs are idle. This cost is expressed as a percentage of the Handling Time. The Overhead Costs associated with the operations of the depots are quantified based on tiers in a sheet called "Reconciliations". A percentage of the overall overhead is allocated to EPRA and varies based on tier. A threshold maximum value of overhead ("cap") can be set in terms of a % of COGS/direct costs (labour and space costs).

The Model Inputs Sheet also contains a scenario storage mechanism, which allows for the dynamic testing of the revenues and costs of the EPRA program under changing sets of assumptions. To the right of the

scenario testing section, we placed a brief output section, which displays average and total financial parameters (such as revenues, gross margin, contribution margin, etc.) by depot size, based on the assumptions of the active scenario.

METHODOLOGY & ASSUMPTIONS

The design of the Costing Model evaluates:

- (1) a base costing scenario using the recently collected data from the interviews and survey, as well as additional market-research-driven data (“BDO Base Case”); and
- (2) an “inflationary” case, which takes the cost assumptions from the base case and applies an inflation index of 2% per year for 5 consecutive years to test the depot margins under an increased cost structure and unchanged revenue structure (“BDO Inflation Case”).

1) Forklift: Duration & Cost

The model uses a fully-loaded hourly cost for the forklift, which considers capex costs, maintenance costs, training costs, and labour, based on market research and interviews with depots. ¹

2) Direct Labour: Duration & Cost

The BDO cases use averages of the results of the EPRA depot survey as an input for handling time, as well as for labour rates, though in deciding upon this we looked closely at the other two sources to compare.

3) Space Costs & Depot Types by Location

This section is used to classify depots based on their location into the four major categories: urban, suburban, small town, and rural. Based on EPRA data, we determined the address of the depots. We then used census data to determine the population size in the area where each depot is located. We then assigned a population range for each type of location as follows:

General Location Categories		
Location Type	Min Population	Max Population
Urban	150,000	1,000,000
Suburban	50,000	149,999
Small Town	10,000	49,999
Rural	-	9,999

The categorization was assigned to each depot on the Depot Model tab, and resulted in the following distribution of depots by location:

No of Depots by Location Type		
Location Type	No of Depots	% of Depots
Urban	38	21.7%
Suburban	33	18.9%
Small Town	37	21.1%
Rural	67	38.3%
Total	175	100.0%

The model uses the depot survey data to determine the average rental cost per square foot for the depot facilities, based on their location type.

4) Depots by Business Type

This section is used to classify depots based on their business type into the four major categories: private, public, not-for-profit. Based on EPRA data, we determined the business type for each depot, and then categorized each depot on the Depot Model tab.

In addition to the classification by business type and location type, the depots were also assigned to a particular Tier, based on the volume of skids delivered from each depot per week:

Tier 1	Tier 2	Tier 3	Tier 4	Single-Sort
>10 Skids/Week	5-10 Skids/Week	2-5 Skids/Week	<2 Skids/Week	n/a

¹ As mentioned above, depots were selected for interviews with the assistance of EPRA
EPRA | BC DEPOT COSTING MODEL

5) Overhead Buildup

This section is used to determine the overhead allocation corresponding to the EPRA program. The main sources of information for this analysis were interviews with two sample depots, one in a suburban location and another in a rural area.

We examined the financial statements to determine the main overhead costs associated with each facility, as well as the percentage of revenues that the EPRA program represents compared to the total revenues of each depot, a parameter that was used as a proxy for EPRA Overhead Allocation. Our selection of revenues as the allocation mechanism stems from the fact that we have no detailed information on total volumes of other programs at these depots, and even if we did, we would need to determine a means of weighting these different volumes. Thus, revenues are the “simplest” method here.

We then used linear interpolation between the Tier 1 and Single Storage depot data to determine the overhead costs and EPRA Overhead Allocation (percentage) for the Tier 2, Tier 3, and Tier 4 depots.

To ensure that our methodology does not consider excessive overhead costs that go beyond the average range of overhead costs for a facility of this type, we considered a Maximum Overhead Threshold parameter, expressed as a percentage of the direct costs for each depot. The overhead for each depot cannot exceed the Maximum Overhead Threshold parameter. This parameter was determined by looking at StatsCan Financial Performance Data for Material Recovery Facilities, as well as the financial statements of several other waste management entities that were as analogous as possible to the depots in our model.

6) Skids Pick-up, Collection, Storage

The space requirements for the EPRA program were evaluated by considering the average number of skids available per pick-up for each tier. This originated from the actual EPRA collection data. We determined the total average number of skids used for each depot tier from the EPRA survey data. The total average number of skids was further broken down into pick-up skids (available for transport to EPRA), collection skids (used for customer collection), and storage skids (additional empty skid space).

KEY OBSERVATIONS AND FINDINGS

The next few pages summarize the key observations and findings and are organized by theme.

OBSERVATIONS & FINDINGS

The work performed, as summarized in the previous sections, identified the following key observations and related findings:

Case	EPRA Scenario				
Labour Rates					
Manual Labour (\$/hr)					\$18
Forklift Labour (\$/hr)					\$48
Handling Time/Skid					
				Pallet	Megabag
Receiving material (min)				3	3
Stacking Skids (min)				16	16
Paperwork processing (min)				3	3
Receiving/handlingsupplies (min)				4	4
Forklift Time/Skid					
				Pallet	Megabag
Moving skids (min)				0.5	0.5
Loading trucks(min)				4	4
Overhead Costs					
Storage to collection Ratio	Tier 1	Tier 2	Tier 3	Tier 4	Single-Sort
Maximum Overhead Threshold (% of Direct Cost)	8.0%	8.0%	8.0%	8.0%	8.0%
Avg Overhead Costs	-	-	-	-	-
EPRA Overhead Allocation (%)	-	-	-	-	-

SCENARIO: BDO BASE CASE

The BDO Base Case assumed an average overhead cost per tier, limited by the maximum overhead threshold, as well as space and labour assumptions arising from either survey information, the EPRA time motion study, interviews, or market research.

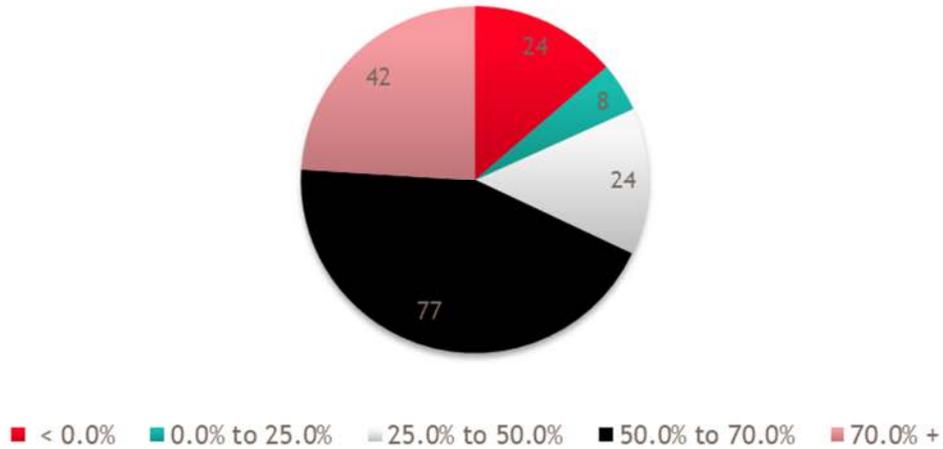
Case						BDO Base Case				
Labour Rates										
Manual Labour (\$/hr)										\$18
Forklift Labour (\$/hr)										\$44
Handling Time/Skid										
Receiving material (min)							Pallet			Megabag
Stacking Skids (min)							44			30
Paperwork processing (min)										
Receiving/handling supplies (min)										
Forklift Time/Skid										
Moving skids (min)							Pallet			Megabag
Loading trucks (min)							5			5
Space Needed										
Storage to Collection Ratio		Tier 1	Tier 2	Tier 3	Tier 4	Single-Sort				
Storage to Supply Ratio		0.28	0.30	0.81	1.01	1.16				
		0.75	0.75	0.75	0.75	0.75				
Space Cost										
Cost/sf			Urban	Suburban	Small Town	Rural				
			\$21	\$17	\$15	\$13				
Idle Time										
Idle Time (% of Handling time)		Tier 1	Tier 2	Tier 3	Tier 4	Single-Sort				
		-	-	-	-	-				
Overhead Costs										
Maximum Overhead Threshold (% of Direct Cost)		Tier 1	Tier 2	Tier 3	Tier 4	Single-Sort				
Avg Overhead Costs		\$490,390	\$387,313	\$284,236	\$181,159	\$78,082				35.6%
EPRA Overhead Allocation (%)		1.9%	1.8%	1.6%	1.5%	1.3%				

The BDO Base Case results in average gross margins of 64.4% and contribution margin (after overhead) of 52.3%. Overall, Tiers 1 through 3 seem to maintain very robust margins, whereas Tier 4 and Single-Sort depots on average seem to have negative contribution margins.

BDO Base Case								
Average Parameters per Tier	Tier 1	Tier 2	Tier 3	Tier 4	Single-Sort	Overall Avg	Total	
Revenues	\$58,284	\$24,827	\$10,499	\$3,963	\$2,235	\$18,107	\$3,204,888	
Direct Costs	\$17,182	\$7,875	\$4,515	\$3,181	\$2,115	\$6,450	\$1,141,674	
Handling	\$9,711	\$3,933	\$1,702	\$647	\$592	\$2,998	\$530,656	
Forklift	\$3,351	\$1,389	\$585	\$218	\$162	\$1,032	\$182,726	
Space	\$4,119	\$2,553	\$2,228	\$2,316	\$1,361	\$2,420	\$428,291	
Gross Margin	\$41,102	\$16,951	\$5,983	\$782	\$120	\$11,657	\$2,063,214	
Gross Margin (%)	70.5%	68.3%	57.0%	19.7%	5.4%	64.4%	64.4%	
Overhead	\$5,792	\$2,806	\$1,555	\$1,033	\$605	\$2,189	\$387,454	
Idle Time	-	-	-	-	-	-	-	
Contribution Margin	\$35,310	\$14,146	\$4,428	(\$251)	(\$485)	\$9,468	\$1,675,761	
Contribution Margin (%)	60.6%	57.0%	42.2%	(6.3%)	(21.7%)	52.3%	52.3%	
Revenue/Skid	\$63	\$65	\$65	\$66	\$50	\$64	\$64	
Total Cost/Skid	\$25	\$28	\$38	\$70	\$61	\$30	\$30	
Total Parameters per Tier								
No of Depots	27	38	47	31	32		175	
Pallets Weight (kg)	3,356,982	2,322,108	1,205,533	311,315	298,032		7,493,970	
Megabags Weight (kg)	3,490,851	1,755,006	927,768	218,810	-		6,392,434	
Total Weight (kg)	6,847,833	4,077,114	2,133,300	530,124	298,032		13,886,404	

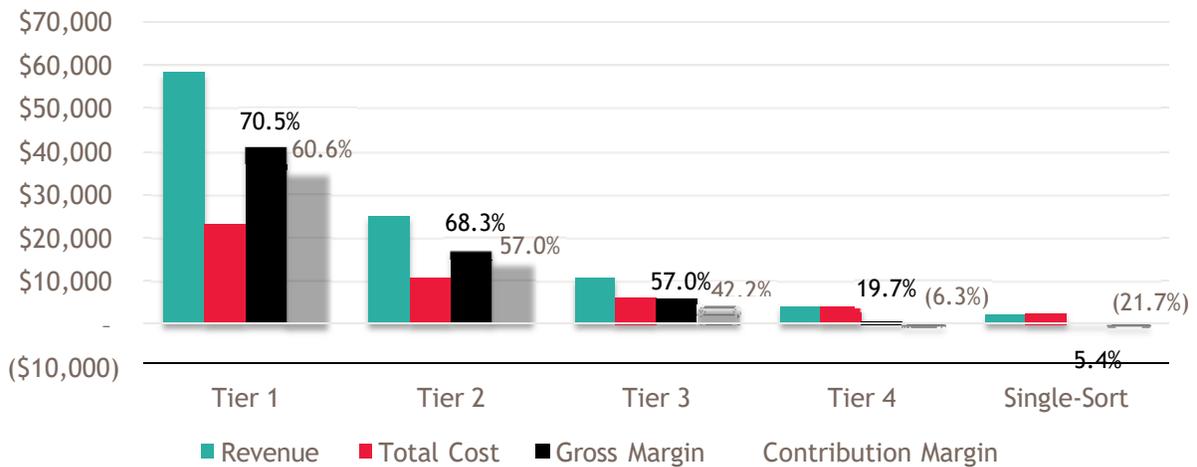
A breakdown of the gross margins by depots shows the following distribution:

Depot Breakdown by Gross Margin



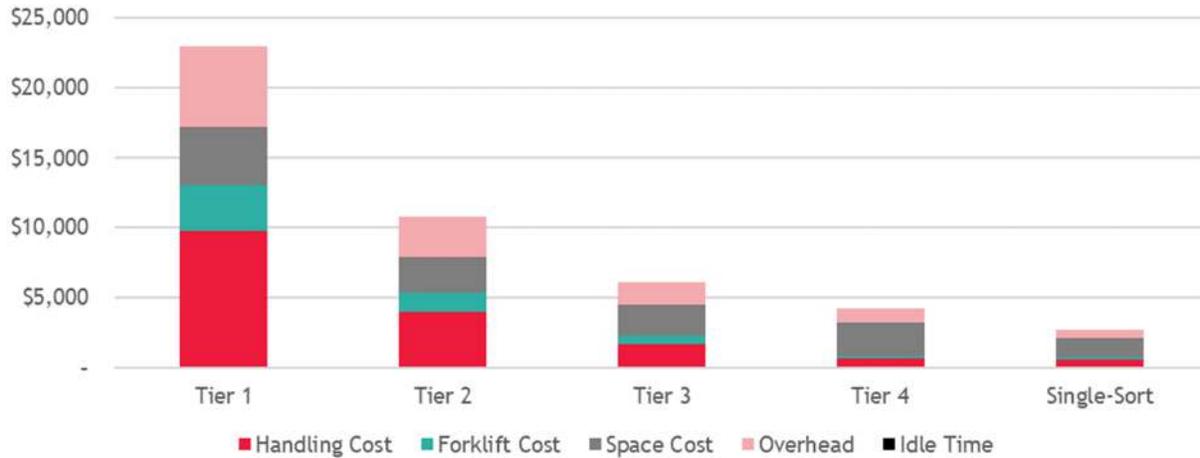
All of the tiers have a positive gross margin and the two tiers showing negative margin depots are single-sort or Tier 4. A breakdown of revenues and costs by Tier show very healthy margins for Tier 1 through 3, indicating that depots with higher electronics volumes tend to have healthier margins.

Revenue & Cost by Tier



When looking at the cost structure, the handling cost seems to be the largest component across the tiers, followed by space costs and overhead. The forklift cost seems to be the lowest component, considering we assumed the idle time cost to be zero, based on reports from depots of no idle time in their facilities. All of these costs also scale naturally with the volume of the collected skids: e.g., Tier 1 depots have the highest volumes and also the highest Handling Cost and Overhead Costs.

Cost Breakdown by Tier



SCENARIO #2: BDO INFLATIONARY CASE

The BDO Inflationary Case was built to stress-test the business margins for inflationary costs under a constant revenue stream, by applying 2% inflation for five years while keeping the operational parameters constant.

Case* BDO Inflationary Case						
Labour Rates						
Manual Labour (\$/hr)						\$20
Forklift Labour (\$/hr)						\$48
Handling Time/Skid						
				Pallet		Megabag
Receiving material (min)				44		30
Stacking Skids (min)						
Paperwork processing (min)						
Receiving/handling supplies (min)						
Forklift Time/Skid						
				Pallet		Megabag
Moving skids (min)				5		5
Loading trucks (min)						
Space Needed						
	Tier 1	Tier 2	Tier 3	Tier 4		Single-Sort
Storage to Collection Ratio	0.28	0.30	0.81	1.01		0.16
Storage to Supply Ratio	0.75	0.75	0.75	0.75		0.75
Space Cost						
		Urban	Suburban	Small Town		Rural
Cost/sf		\$24	\$18	\$16		\$14
Idle Time						
	Tier 1	Tier 2	Tier 3	Tier 4		Single-Sort
Idle Time (% of Handling time)	-	-	-	-		-
Overhead Costs						
	Tier 1	Tier 2	Tier 3	Tier 4		Single-Sort
Maximum Overhead Threshold (% of Direct Cost)	35.6%	35.6%	35.6%	35.6%		35.6%
Avg Overhead Costs	\$541,430	\$427,625	\$313,819	\$200,014		\$86,209
EPRA Overhead Allocation (%)	1.9%	1.8%	1.6%	1.5%		1.3%
Inflation Index						
	110.4%	*Assume Inflation of 2% per year for 5 Years				

As a result of cost increases, the margins decrease with the gross margin averaging 61.3% and the contribution margin averaging 48.2%.

BDO Inflationary Case							
Average Parameters per Tier	Tier 1	Tier 2	Tier 3	Tier 4	Single-Sort	Overall Avg	Total
Revenues	\$58,284	\$24,827	\$10,499	\$3,963	\$2,235	\$18,107	\$3,204,888
Direct Costs	\$18,579	\$8,543	\$4,951	\$3,447	\$2,318	\$7,006	\$1,239,991
Handling	\$10,440	\$4,258	\$1,854	\$699	\$640	\$3,237	\$572,979
Forklift	\$3,700	\$1,534	\$646	\$240	\$179	\$1,140	\$201,745
Space	\$4,439	\$2,751	\$2,450	\$2,508	\$1,499	\$2,629	\$465,267
Gross Margin	\$39,705	\$16,283	\$5,548	\$516	(\$82)	\$11,101	\$1,964,897
Gross Margin (%)	68.1%	65.6%	52.8%	13.0%	(3.7%)	61.3%	61.3%
Overhead	\$6,289	\$3,044	\$1,705	\$1,120	\$662	\$2,381	\$421,485
Idle Time	-	-	-	-	-	-	-
Contribution Margin	\$33,416	\$13,240	\$3,843	(\$605)	(\$744)	\$8,720	\$1,543,412
Contribution Margin (%)	57.3%	53.3%	36.6%	(15.3%)	(33.3%)	48.2%	48.2%
Revenue/Skid	\$63	\$65	\$65	\$66	\$50	\$64	\$64
Total Cost/Skid	\$27	\$30	\$41	\$76	\$67	\$33	\$33
Total Parameters per Tier	Tier 1	Tier 2	Tier 3	Tier 4	Single-Sort	Total	
No of Depots	27	38	47	31	32	175	
Pallets Weight (kg)	3,356,982	2,322,108	1,205,533	311,315	298,032	7,493,970	
Megabags Weight (kg)	3,490,851	1,755,006	927,768	218,810	-	6,392,434	
Total Weight (kg)	6,847,833	4,077,114	2,133,300	530,124	298,032	13,886,404	

This suggests that depots that have efficient operations can sustain healthy margins long-term despite an increase in their cost structure and flat revenues.

Conclusion:

Our cost model evaluated the ability of a recycling program to cover their program's direct costs as well as contribute in a reasonable manner to overhead expenses. The cost model generated by BDO (BDO Base Case) assumed an average overhead cost per tier (with depots tiered by weekly skid volumes), limited by a maximum overhead threshold, as well as space and labour assumptions arising from either survey information, relevant time motion studies, interviews, or market research.

Our on-site and interview research highlighted that many depots and recycling facilities acknowledged that although they do not believe the program generates a significant profit, there are many benefits to having EPRA's EOLE program other than the compensation and that the program added value to their facility.

Despite the impressions of the facilities mentioned above, the BDO Base Case resulted in an average positive gross margin of 64.4% and a contribution margin (after overhead) of 52.3%. Overall, depots seeing volumes of 2 or more skids per week (in our analysis, "Tiers" 1 through 3) seem to maintain robust margins, whereas Tier 4 (less than 2 skids per week) and Single-Sort depots on average receive revenue that covers their direct costs but may not entirely cover an overhead assumption and therefore these depots experience modestly negative contribution margins.

In light of the fact that our contribution margin calculation includes absorption of overhead (including staffing, insurance, accounting, legal, utilities, etc.) and essentially omits only interest and income tax costs, we conclude that the EPRA compensation for electronics handling at the majority of depots is adequate relative to their costs.