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Waste Auditing and Reduction Planning for ICI Sector

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Industry Experience & Skills

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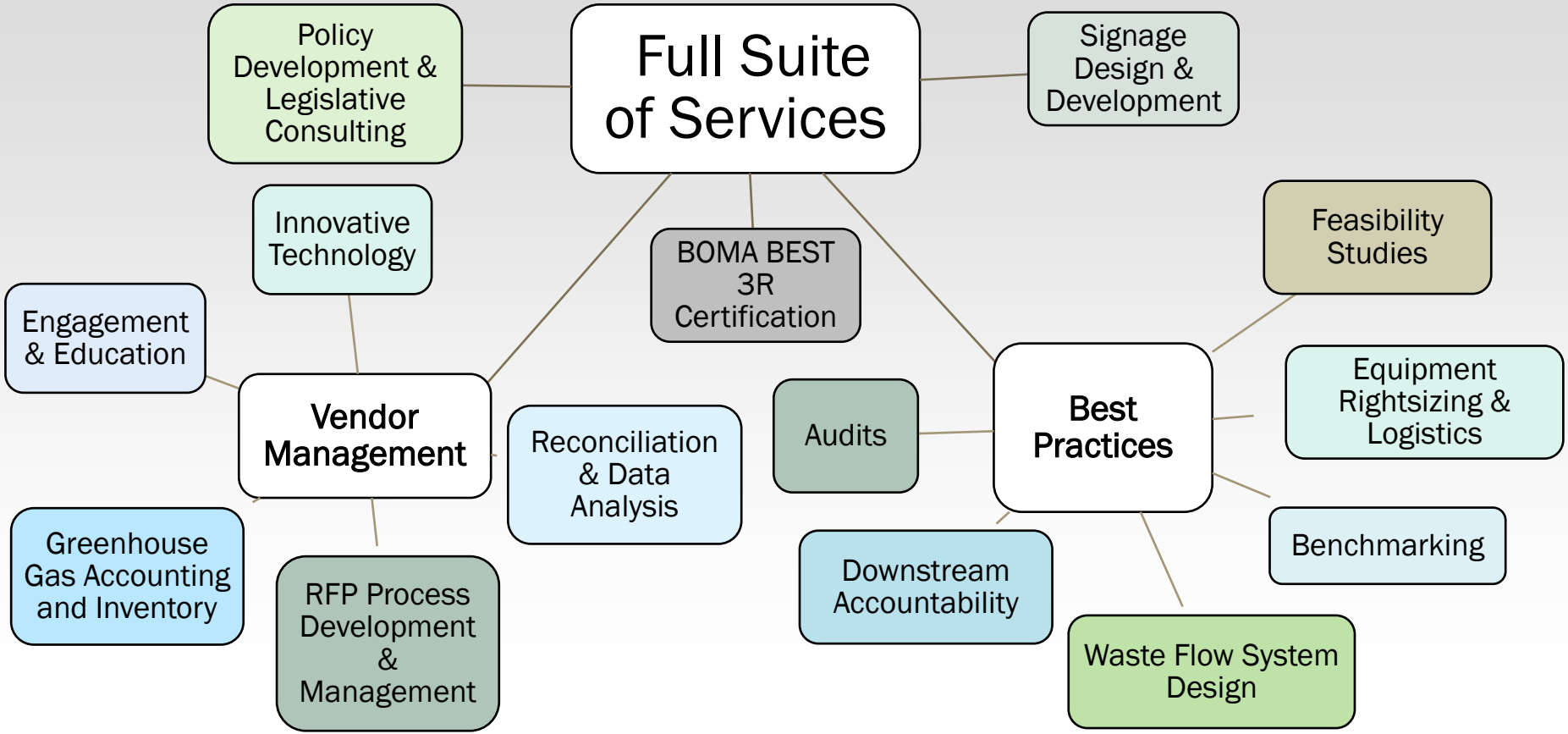
Our Services



Top Goals as Waste Management Professionals

1

Optimize programs & equipment to increase cost savings and improve sustainability

2

Zero Waste Initiatives

4R’s

Reduce, Ruse, Recycle, Rethink

3

Achieve maximum diversion rate while minimizing environmental impact

Waste Audits & Waste Reduction Work Plan

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- Waste sample is **hand-sorted** using a fine-sort process according to point of generation
- Sorting and weighting the **FULL** sample
- Materials sorted into one of **35** waste stream **categorie**s
- Auditors are **Certified Waste Auditors** (CWA)
- Recommendations are **unique and site-specific** – our reports are not cookie cutter!
- PragmaTech audits score full points for 3R certification, BOMA, ISO and LEED projects
- We also conduct Recycling, Packaging, Water and Energy Audits on behalf of our clients

The Waste Audit Process

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1. Pre-audit meeting
2. Send pre-audit checklist
3. Onsite Audit is hand-sort by point of generation
4. Facility tour
5. Examine current waste equipment, programs & haulage
6. Collect photos of facility & audit sort
7. Record notes on findings & observations
8. Weigh & record waste/recycling streams
9. Review current waste management policies and procedures
10. What is the acceptance criteria and downstream for waste streams
11. Prepare report with site specific recommendations
12. Post-audit meeting

3R Current Site Processes

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Reduce	
▪ A "Waste 3Rs Strategy" is posted, along with the waste and recycling acceptance criteria in all lunchroom areas.	
▪ Restrooms are equipped with hand dryers.	
▪ Water re-fill stations are installed to reduce the number of plastics entering the waste streams at the mall. The paper cups for the water re-fill stations can be included in the organics program.	
Reuse	
▪ Restrooms are equipped with reusable hand towels, which are laundered on-site and continuously re-used.	
▪ Un-opened condiment packages are donated to a local charity.	
▪ Unclaimed items and textiles (clothing) from the Lost & Found are donated to a local charity.	
▪ Pallets are to be returned to vendors.	
Recycling Programs	
Program	**Accepted Materials**
Co-mingled Containers	**Pape Fibres:** office paper, paper receipts, packing paper, newsprint, magazines and flyers, boxboard, paper cups, envelopes, file folders, paper tags, paper take out trays. **Cans, Plastics & Bottles:** Plastics #1-7, glass bottles and jars, plastic signage, strapping, plastic & mixed metal hangers, tetra cartons, aluminum and steel food and beverage containers, plastic pails, and jugs. **Soft Plastics:** LDPE #4 soft plastic, shrink wrap, bubble wrap, film plastic, #2 HDPE bags and plastic bags.
Cardboard	cardboard and boxboard are placed into the cardboard compactor.
Wood Skids/Pallets	pallets are stacked in Delivery Area A for collection by an independent recycler.
Batteries	batteries are collected and recycled once a sufficient amount is accumulated
Shredded Paper	Information-sensitive documents are collected, shredded by a third-party company, and sent for recycling.
Printer Cartridges	All types of printer cartridges/toners are collected for recycling
Organics/Compost	coffee grounds/filters, teabags, food-soiled paper/boxboard, wooden chopsticks, compostable materials, food waste, parchment paper, packaged food waste, paper towels and paper cups
Textiles	Used clothing and items from the lost and found
Lightbulbs	light bulbs are collected in totes in the recycling depot
Used Cooking Oil	tenants collect and dump their used cooking oil into one of two vacuum storage tanks when needed.

Key Performance Indicators

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1.) Diversion Rate 2.) Capture Rate 3.) Waste Generation Rate

Shrink Wrap (#4)	Recycled	68.1139981	55.406	81.34%	12.7079981
Polystyrene (#6-7)	Recycled	7.3446096	2.8704	39.08%	4.4742096
Compostable Material	Composted	230.0505091	192.7965	83.81%	37.2540091
Paper Towels	Composted	94.0068051	74.1525	78.88%	19.8543051
Coffee Cups	Composted	34.5702022	29.661	85.80%	4.9092022
Waste Cooking Oil	Recycled	21.7142	21.7142	100.00%	0
Wood Skids	Recycled/Re-used	54.844	54.844	100.00%	0
Other: Electronics, batteries, scrap metal, donated textiles	Recycled	3.1430381	2.8634	91.10%	0.2796381
SUB-TOTAL		**1043.710681**	**897.30460**	-	**146.4060808**
Non-Recyclable Waste (Garbage)	Disposed	164.3029192	310.709	-	
TOTAL		**1208.0136**	**1208.01360**		**146.4060808**
WASTE DIVERSION RATE	**74.28%**	**CAPTURE RATE**		**85.97%**	**Regulatory Objective** 80% Diversion by 2020
Not Recycled: condiment pkgs, ink cartridges, Liquids, plastic forks, disposable cups, plastic hangers, plastic strapping, Styrofoam	Available Materials for Recycling	12.4284	0.0000	0.00%	12.42836
TOTAL		**1056.1390**			**158.8344408**
MAX DIVERSION RATE	**87.43%**	**MATERIALS AVAILABLE FOR RECYCLING IN NON-RECYCLING**		**51.12%**	

Diversion Rate

2022 Solid Waste Stream Composition		
Waste Composition	**Weight (MT)**	**Percentage (%)**
Cardboard	147.3700	31.528%
Mixed Paper/Fibers	52.5948	11.252%
Shredded Paper	0.9525	0.204%
Beverage/Steel Cans	17.45489925	3.734%
Gable Top/Aseptic Containers	1.93943325	0.415%
Glass Bottles/Jars	1.31487	0.281%
Co-Mingled Plastics #1-5	40.146268	8.589%
Co-Mingled Plastics #6-7	18.036729225	3.859%
Organics/Compost	36.6040	7.831%
Used Cooking Oil	6.3140	1.351%
Electronics	0.2722	0.058%
Donated Textiles	0.0000	0.000%
Wood/Pallets	1.2240	0.262%
Condiment Packages	0.0000	0.000%
Ink Toner/Cartridges	0.2268	0.049%
Scrap Metal	18.1439	3.882%
Total Recyclables	**342.5944000**	**73.29%**
Total Disposed	**124.8300**	**26.71%**
Total Generated	**467.42440**	**100.00%**
Diversion Rate	**342.5944**	**73.29%**

Point-of-Generation Auditing

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Table 8: Food Tenants		
Sorted: June 12-13, 2019	**Kg over a 24-hr period**	**% of Each Waste Stream**
Gable Top/Aseptic Containers	0.18	0.37
PET #1	0.86	1.79
HDPE #2	0.98	2.04
LDPE #4	0.06	0.12
PP #5	0.22	0.46
PS #6	0.88	1.82
Plastic Strapping	0.01	0.03
Mixed Paper	1.04	2.16
Magazines/Flyers	0.01	0.03
Boxboard	0.43	0.90
Corrugated Cardboard	0.24	0.49
Paper Cups	0.33	0.68
Paper Towel	6.26	13.00
Organics/Food Waste	8.92	18.53
Compostable Materials	4.10	8.52
Coffee Pods	0.13	0.28
Textiles	1.03	2.13
Disposable Cups (Waxy)	***0.73***	***1.51***
Non-Recyclable Waste	***21.52***	***44.72***
Expanded #6	***0.13***	***0.28***
Liquid	0.06	0.12
Total	**48.12**	**100.00**
Possible Diversion - Available Programs	**24.65**	**51.24%**
Possible Diversion - Existing Programs	**24.19**	**50.28%**

Table 10: Food Court Common Area		
Sorted: June 12-13, 2019	**Kg over a 24-hr period**	**% of Each Waste Stream**
Aluminum Cans	0.10	0.08
Gable Top/Aseptic Containers	0.48	0.42
PET #1	1.90	1.68
Plastic Bags (HDPE/LDPE)	0.21	0.19
PP #5	0.45	0.40
PS #6	1.92	1.70
Other #7	0.07	0.06
Mixed Paper	0.31	0.27
Boxboard	0.07	0.06
Paper Cups	1.26	1.11
Paper Towel	10.26	9.05
Organics/Food Waste	33.07	29.18
Compostable Materials	21.26	18.76
Disposable Cups (Waxy)	***3.85***	***3.40***
Non-Recyclable Waste	***31.29***	***27.60***
Expanded #6	***3.09***	***2.72***
Liquid	1.50	1.32
Wax Kraft Bags	2.26	1.99
Total	**113.34**	**100.00**
Possible Diversion - Available Programs	**71.36**	**62.96%**
Possible Diversion - Existing Programs	**70.10**	**61.85%**

Fine sorting the full 24-hr sample

- Summary charts break down waste sample by program and material
- Waste Composition Breakdown
- Identify possible Diversion Rates with existing programs and available programs

Table 5: Total Waste Sample Composition Analysis – Disposed by Category		
Sorted: June 12-13, 2019	**Kg over a 24-hr. period**	**% of Each Waste Stream**
Mixed Recycling	55.44	18.16
Mixed Fibers	12.08	3.96
Organic/Compost	120.16	39.37
Other Recyclables	0.98	0.32
Non-Recyclable Waste	***116.56***	***38.19***
Total	**305.22**	**100.00**
Total Possible Diversion	**188.66**	**61.81%**

Table 6: Total Waste Composition Analysis – Disposed by Material		
Sorted: June 12-13, 2019	**Kg over a 24-hr period**	**% of Each Waste Stream**
Aluminum Cans	0.43	0.14
Aerosol Cans	0.33	0.11
Gable Top/Aseptic Containers	1.00	0.33
PET #1	5.42	1.78
HDPE #2	2.18	0.71
PVC #3	3.70	1.21
LDPE #4	33.62	11.01
Plastic Bags (HDPE/LDPE)	1.03	0.34
PP #5	3.11	1.02
PS #6	4.00	1.31
Other #7	0.11	0.04
Plastic Strapping	0.13	0.04
Plastic Hangers	0.37	0.12
Styrofoam	0.01	0.00
Mixed Paper	6.88	2.25
Newsprint	0.36	0.12
Magazines/Flyers	0.08	0.03
Boxboard	4.29	1.40
Corrugated Cardboard	0.47	0.15
Paper Cu	3.70	1.21
Pap	31.69	10.38
ganics/Food W	52.78	17.29
ompostable Mate	28.85	9.45
lectronics	0.60	0.20
	0.25	0.08
	0.13	0.04
	4.01	1.31
rap Metal	***5.53***	***1.81***
	96.98	***31.77***
	3.56	***1.17***
Liq Pods	3.14	1.03
Diapers	***4.23***	***1.39***
Wax Kraft Bags		0.74
Total		100.00
Possible Diversion - Available Programs		61.81%
Possible Diversion - Existing Programs		60.60%

Situational Analysis

Auditors Observations, Findings & Waste Analysis

Weights gathered from the 24-hour waste sample on August 12, 2021 & October 28, 2021, are shown in Tables 5 & 6. The breakdown of each audited area is shown in Tables 7 through 19. Pictures taken during the on-site audit are provided in Appendix A.

Material	Mass (kg)	%
LDPE #4 (shrink/film)	13.28	1.61
Used gloves	9.35	1.13
Metal Cans	2.42	0.30
Mixed Paper	10.13	1.23
Plastic Bottles/Containers	8.36	1.01
Organics	29.39	3.56

Combined, these six materials total **72.93 kg** and represent **8.84%** of the materials disposed of as non-recyclable waste over the 24-hour period. Annualized, this volume translates to **44.2 MT** **(8.84% x 499.95 MT)** of recyclable materials being disposed of each year that could be diverted using the existing recycling programs at your facility. These materials can be used as a guide when expanding your waste management system and determining which program(s) to prioritize. To identify materials please see Appendix A Photo Display 2.

Site-Specific Detailed Recommendations

Each of our recommendations is detailed with **step-by-step** instructions to help our clients meet their sustainability goals

Summary of Recommendations

- **Ban black bag use at the mall and conduct spot checks**
- **Develop a Tenant Engagement Program**

Detailed Recommendations

Ban black bag use at the mall and conduct spot checks- During the audit, it was noted that tenants are using black bags to dispose of waste, recycling, and food waste. I recommend the use of clear bags by ALL tenants and the implementation of a feedback system that includes the spot checks to support proper recycling practices.

First Step - Use of Clear Bags: Ask tenants to use only clear bags to dispose of all waste and recycling. Beginning with clear bags will allow recycling ambassador and staff to provide feedback; send a memo or create a policy regarding the use of black bags.

Second Step - Program Monitoring and Support: Most food tenants and some retail tenants are currently using black bags to dispose of non-recyclable waste in the compactors. The use of clear bags by tenants will allow the bags to be spot checked to examine bags for contamination without any health or safety risk. Spot checks should be completed periodically by the recycling ambassador, management or security bi-weekly. The spot check can be set up by the non-recyclable compactors at peak disposal times. The person conducting the spot check would record the name of the tenant using black bags and submit to management. This is a good time to look in the bags and if there is too much recycling and organics send the tenant back to re-

Creating a plan

Employee Centered

Data Driven

Transparent

Fiscally Responsible

Environmentally Sustainable

Innovative

Accountability

Waste Reduction Work Plan

- We develop site-specific goals for each property and assess the achievement of these goals each year

- We also provide timelines and action plans for management to measure facility progress.

Goal #1:	Performance Measure
Increase Capture of the source separated recycling programs	Capture Rate

3R Outcome Objectives

Recycle	Continued education and program awareness scheduled quarterly. The PPT has been running on all monitors throughout the facility once per month. The PPT has been updated to reflect the latest information. The Green team has promoted recycling and helped identify and address the issues in each department. An SOP is being updated to include waste and recycling. Removal of office waste receptacles has been completed. Contamination is being checked, evaluated, and addressed quarterly to achieve the highest level of participation. **The capture rate has increased to 25%**

Action Plan

Task	Completion (MM/DD/YYYY)	Area/Location	Responsibility
Contamination levels are being checked	Monthly	Red Totes Outside	Collection Staff
Engagement activities	Quarterly	Facility Wide	Management
PPT updated	01/25/2022	Facility Wide	Management
Run the PPT throughout the facility	Monthly	Facility Wide	Management
Green Team has identified and addressed department issues for recycling	03/01/2022	Facility Wide	Green Team
Removal of all office waste receptacles	06/30/2021	Office Area	Management/ Green Team
Capture rate goal completed	03/31/2022	Facility Wide	Management

Results from Previous Years WRWP

Goal #1:	Performance Measure
Implement a source separated recycling program.	Diversion Rate
3R Outcome Objectives	
Recycle	Budget for source separation has been updated – how many totes need to be set up for each material. Review of which company offers the best source separated program that with the highest acceptable criteria matches TBA's generation. Program training for all staff is completed. Implement Program
Result: Congratulations, Achieved!	

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Sustainability is made up of *three* pillars: **the economy, society, and the environment**.

The **environmental pillar** often gets the most attention. Companies are focusing on reducing their carbon footprints, packaging waste, water usage and their overall effect on the environment.

A **circular economy** is "a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible".

Aligning with Current and Upcoming Regulations

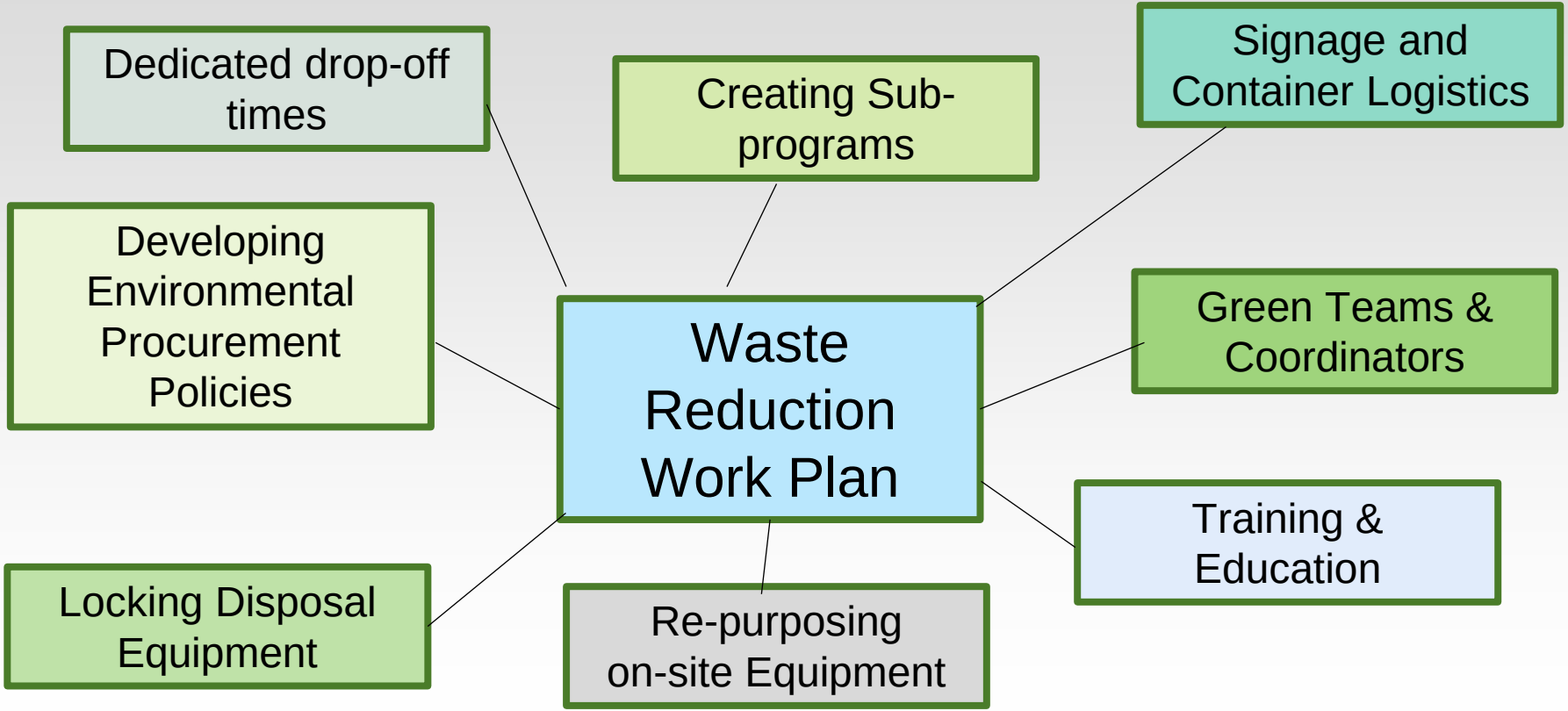
Legislative Compliance Requirements – IC&I Sector

Ontario Ministry of Environment, Conservation and Parks' (MECP) Environmental Protection Act RSO. 1990 c E.19, Waste Reduction Audit Requirements Regulation *102/94*. *O. Reg. 103/94* requires Source Separation Programs.

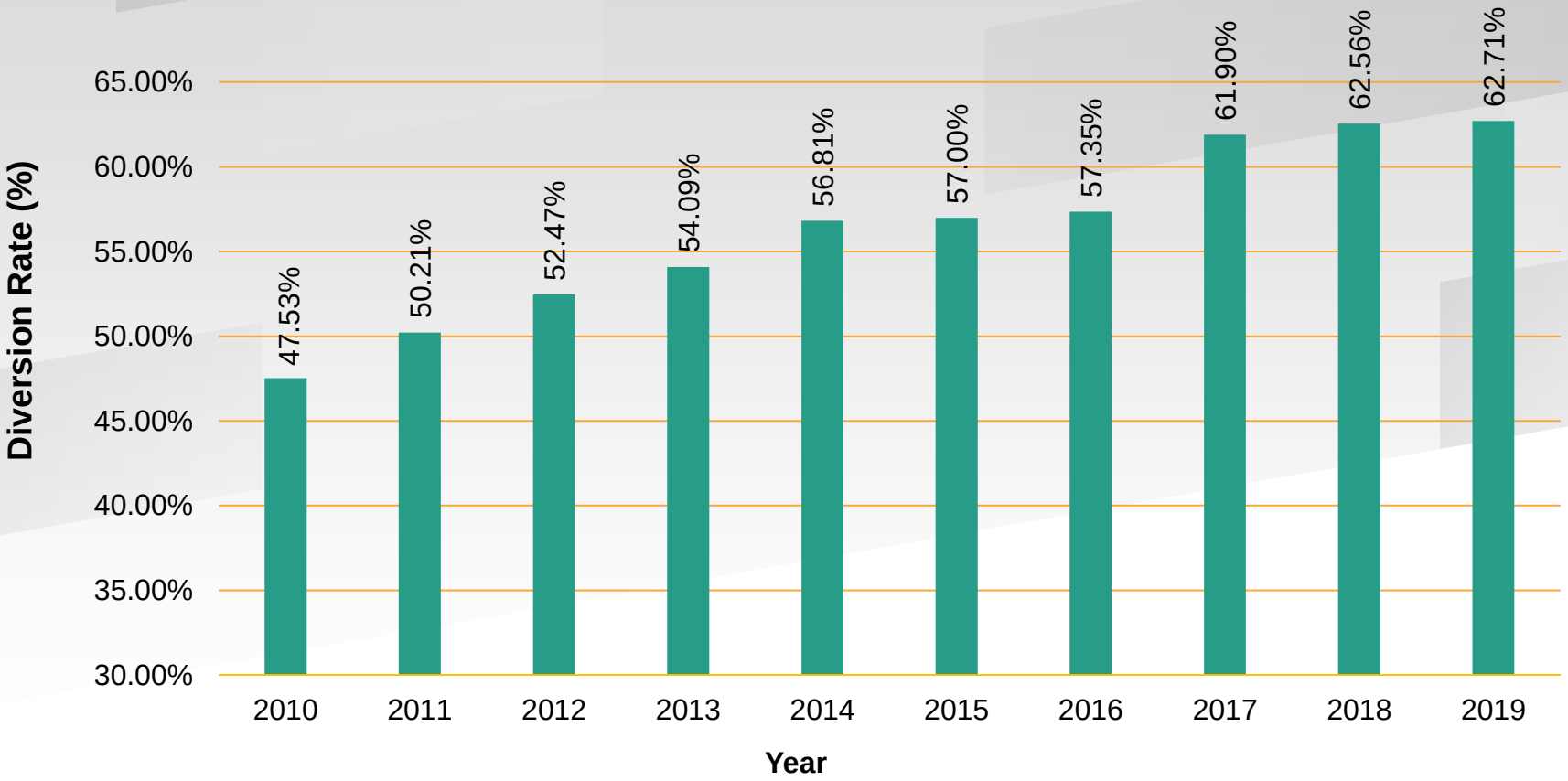
Electronics and Electrical Equipment (EEE)

The province of Ontario has prepared a new e-waste regulation that is expected to take effect in January 2021. The regulation requires producers to safely manage the entire lifecycle of their electrical and electronic products including smartphones, personal computers, and gaming equipment. The regulation puts forward an ambitious recycling target of 70% and aims to encourage business to reuse, resell, and recycle electronic devices.
The regulation, which takes effect on January 1, 2021, also promotes the reuse and refurbishment of products so they can be resold.

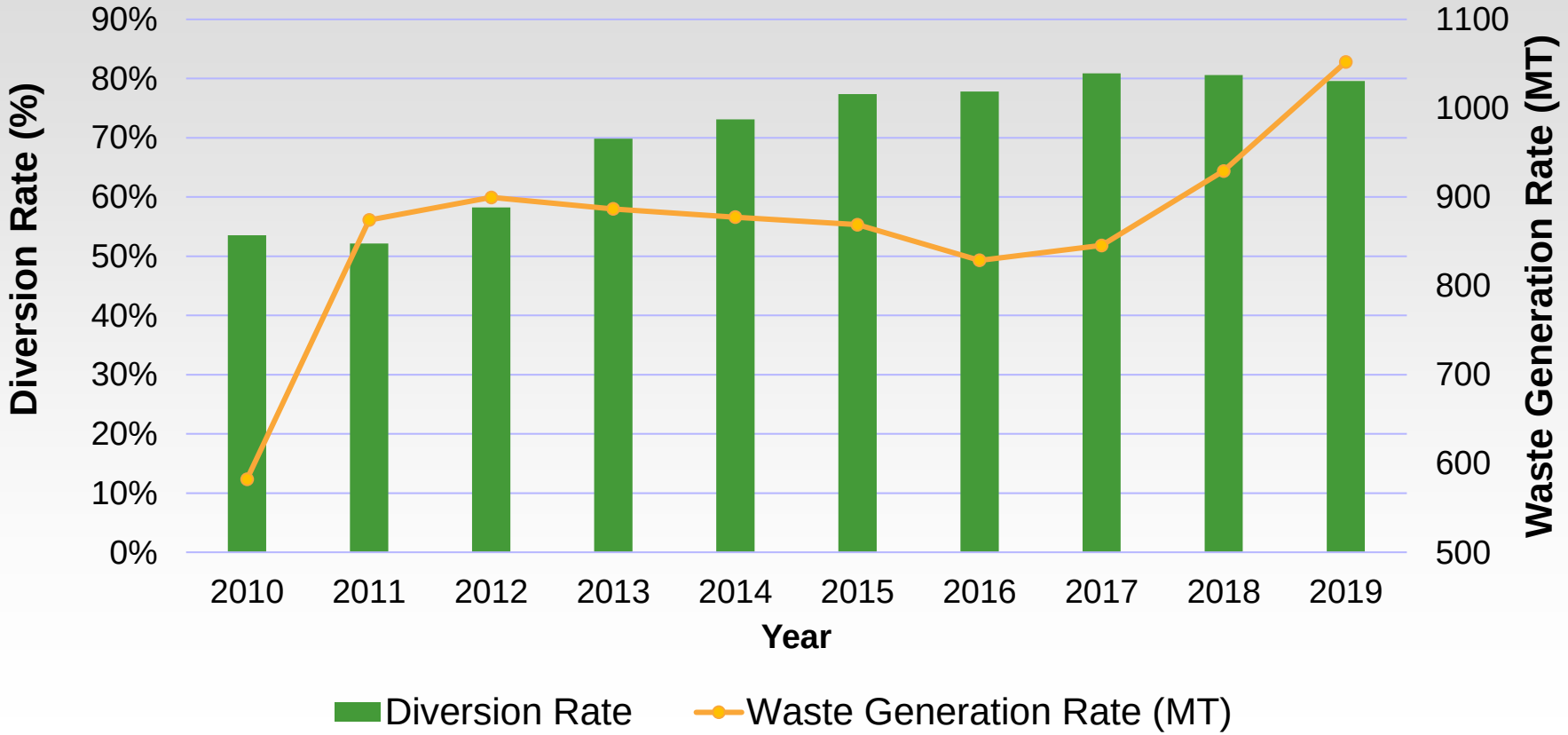
Implementation Strategies



Diversion Rate Success GTA Client



Waterloo Client's Diversion Rate as their waste generation increases year-over-year



Report of a Packaging Audit and Reduction Work Plan

As required by Ontario Regulation 104/94 of the Environmental Protection Act (EPA) Ontario Ministry of Environment, Conservation and Parks

PACKAGING AUDIT

A packaging audit can reveal many different aspects of your company and its day-to-day processes, while disclosing critical information that can **positively contribute to sustainability initiatives and reduce your environmental footprint**.

A packaging audit can:

- *Justify the benefits of new waste diversion programs and equipment to management and key decision-makers*
- *Identify opportunities to enhance the efficacy and functionality of internal processes*
- *Expose hidden economic opportunities and unnecessary expenditures*
- *Provide positive publicity and reinforce the company's environmental mission to customers, stakeholders, and employees*
- *Improve client-vendor partnerships by increasing communication and identifying sustainable business alternatives*

Designated manufacturing establishments in the Industrial, Commercial, and Institutional (ICI) sector have an environmental stewardship responsibility to conduct a bi-annual packaging audit covering the packaging of the products manufactured or packaged at the site.

Waste Management Certifications

Certification include a waste management component

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Reward for all the hard work

Conclusion

Understanding the recycling programs, and the materials generated and diverted, can significantly minimize the effects of our waste generation, and continue to be of vital importance to sustainability and the preservation of the Canadian environment

Source - https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/solid-waste-diversion-disposal.html

Thank you!