

RESEARCH AND RECOMMENDATIONS FOR

# PERFORMANCE MEASURES

For Regulated, Industry-led, End-of-life  
Electronics Recycling Programs In Canada

Commissioned By:



Atlantic Canada Electronics Stewardship (ACES)



Ontario Electronic Stewardship (OES)








Saskatchewan Waste Electronic Equipment Program (SWEEP)



# Snapshot of Canadian Regulated Electronics Recycling Programs

Data as of June 30, 2011

Program	Registered Industry Members*	Permanent Collection Sites	Phase Collection Start Date	Cumulative Tonnes Collected
	1,639	121	P1: Aug '07 P2: Jul '10 P4: Jul '12	55,250
	1,771	310	P1: Oct '04	75,497
	665	71	P1: Feb '07 P2: Apr '10	9,625
	816	711	P1: Apr '09 P2: Apr '10	63,188
	584	42	P1: Feb '08 P2: Feb '09 PEI: Jul '10	12,540
<b>TOTALS</b>	<b>5,475*</b>	<b>1,255</b>	<b>* * *</b>	<b>216,100</b>

# Background and Objectives

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**Objective of this study** – to analyze and make recommendations for a core suite of performance indicators for the programs to adopt.

**Primary purpose of the core indicators:**

- To allow each program to track its own performance over time;
- To facilitate comparisons and benchmarking between jurisdictions;
- To communicate performance accomplishments and targets to government and other stakeholders.



# Performance Measures Guiding Principles

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In order to develop a preferred set of core indicators, it is necessary to have a series of guiding principles to evaluate different options.

**#1. Representative of Performance** – It should convey something meaningful about the program's performance. It should be responsive to change and within the program's capacity to influence over time. It should also be reflective of the key policy reasons for implementing the programs.



# Performance Measures Guiding Principles

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**#2. Easily communicated to and understood by stakeholders** – The indicator should be intuitive to understand and easily communicated to stakeholders.



# Performance Measures Guiding Principles

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**#3. Data accessibility and reliability** – The indicator should be based on data that is feasible for the program to collect, maintain and report with accuracy. Where estimates are used they should be clearly stated. Ideally data could be independently surveyed and verified by a third party. Estimates produced through modelling techniques cannot be independently reviewed and verified and therefore should not be used.



# Performance Measures Guiding Principles

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**#4. Cost effectiveness** – The indicator should be cost effective to collect and report.

**#5. Comparability across programs** – The indicator should facilitate comparisons across programs and with other jurisdictions.



# Case Study Program Criteria

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- **Geographic location** – selection of programs within Canada, USA and Europe.
- **Program duration** – those operating for a longer period of time assumed to have better established data collection methods and reporting mechanisms.
- **Reputation** – leading edge electronics recycling programs as per an assessment of relevant literature and communications with key industry personnel.

A total of 13 program case studies were completed. Data collection was also undertaken regarding the WEEE Directive. The research team discovered that across these programs performance indicators fall into one of 5 groups of indicators.



# International Case Studies

## ***PROGRAMS / JURISDICTIONS EXAMINED:***

CANADA	UNITED STATES	EUROPE
ACES (Nova Scotia)	California	El Kretsen (Sweden)
ESABC (British Columbia)	Maine	Recupel (Belgium)
OES (Ontario)	Minnesota	SWICO (Switzerland)
SWEEP (Saskatchewan)	Oregon	WEEE Directive
ARMA (Alberta)	Washington	



# Case Study Findings

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## *Indicators*

- **Financial indicators** – reflect program performance in financial terms, including costs associated with transportation, collection, processing and communication.
- **Operational indicators** – seek to characterize program performance based on recycling and collection volumes or rates (and other related processes).



# Case Study Findings

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## *Indicators*

- **Awareness indicators** – measures, often obtained through public surveys to characterize program success in terms of public awareness and engagement.
- **Accessibility indicators** – to describe the ease or convenience associated with collection and recycling.



# Case Study Findings

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## *Indicators*

- **Environmental Impact Measures** – to characterize or measure actions undertaken to reduce the environmental impacts of electronic products including design for environment, mass balance, recycling efficiency and others.



# Recommended Performance Indicators

<p style="text-align: center;"><b>Operational Indicators</b></p> <ul style="list-style-type: none"> <li>✓ Total WEEE Collected (tonnes)</li> <li>✓ Total WEEE collected per capita (tonnes)</li> </ul>	<p style="text-align: center;"><b>Financial Indicators</b></p> <ul style="list-style-type: none"> <li>✓ Total program costs per tonne</li> <li>✓ Operational costs per tonne</li> <li>✓ Overhead costs per tonne</li> </ul>
<p style="text-align: center;"><b>Accessibility Indicators</b></p> <ul style="list-style-type: none"> <li>✓ Per cent of population covered by collection sites</li> <li>✓ Total collection sites</li> <li>✓ Total collection events</li> </ul>	<p style="text-align: center;"><b>Environmental Impact Indicators</b></p> <ul style="list-style-type: none"> <li>❖ <i>Total weight of material recycled as percentage of material collected (by weight)</i></li> <li>❖ <i>Greenhouse gas emissions</i></li> <li>❖ <i>Mass balancing</i></li> <li>❖ <i>Trends in processing</i></li> </ul>
<p style="text-align: center;"><b>Awareness Indicators</b></p> <ul style="list-style-type: none"> <li>✓ Percentage of population aware of the program</li> </ul>	

✓ = Immediate Collection & Reporting  
 ❖ = Future / In Development



# Summary of Recommended Performance Measures (I)

Indicator	Description/Background
<b>Operational Indicators</b>	
<b>Total WEEE collected (tonnes)</b>	Phases of obligated products must be taken into account here
<b>Total WEEE collected per capita</b>	Most often compared measure
<b>Financial Indicators</b>	
<b>Total program costs per tonne</b>	Using program fiscal year
<b>Operational costs (collection, consolidation, transportation and processing) per tonne</b>	Further work required to ensure that input data for each program is comparable
<b>Overhead costs (administration, communication, outreach, etc.) per tonne</b>	Further work required to ensure that input data for each program is comparable



# Summary of Recommended Performance Measures (II)

Indicator	Description/Background
<b>Accessibility Indicators</b>	
<i>Per cent of population covered by collection sites</i>	Diverse geographies covered, “coverage” is determined locally
<i>Total collection sites</i>	Total number of publicly accessible permanent sites
<i>Total collection events</i>	Only those events which collect obligated products to be managed through the program
<b>Awareness Indicators</b>	
<i>Percentage of population aware of the program</i>	Through public opinion surveys, work required on timing/wording harmonization



# KEY PERFORMANCE INDICATORS



**ESABC**

British Columbia

2010



**SWEEP**

Saskatchewan

2010-2011



**OES**

Ontario

2010-11



**ACES**

Nova Scotia, Prince Edward Island

XXXX

## Collection Operational Indicators.



Total Waste Electronic Equipment Collected

Measures related to the weight of regulated electronics collected by the program for recycling.

17,145 tonnes  
Total collected



2,841 tonnes  
Total collected



3.78 kg/capita  
Total collected per capita



2.72 kg/capita  
Total collected per capita



## Access Accessibility Indicators.



Collection site coverage and events

Measures related to the convenience of accessing the program to have regulated electronics recycled.

97.4%



% of the B.C. population within 45 minutes (rural) or 30 minutes (urban) of an ESABC collection depot

95%



% of the Saskatchewan population within 45 minutes (rural) or 30 minutes (urban) of an SWEEP collection depot

12



Total Collection Events

40



Total Collection Events

110



Total Collection Sites

71



Total Collection Sites

## Awareness Public Awareness and Industry Participation Indicators.



Public awareness and industry participation

Measures related to the public's awareness of the program, and the direct participation of obligated industry in the program for environmental compliance.

78%



Percentage of population aware of program

82%



Percentage of population aware of program

1,615



Participating manufacturers, retailers and other industry members of ESABC

659



Participating manufacturers, retailers and other industry members of SWEEP

## Collection Financial Indicators.



Total program costs per tonne

Measures related to the overall costs of delivering the program, including collection, consolidation, transportation, audits, processing, administration, communications, management and professional fees.

\$1,141



Operational costs per tonne

\$1,346



Operational costs per tonne

\$106



Overhead costs per tonne

\$499



Overhead costs per tonne

\$1,325



per tonne

Total program costs per tonne

\$1,863



per tonne

Total program costs per tonne

2010-11 SWEEP

# KEY PERFORMANCE INDICATORS



## Collection Operational Indicators.

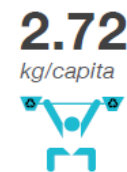


Total Waste Electronic Equipment Collected

2,841 tonnes



2,841 tonnes  
Total collected



2.72 kg/capita  
Total collected per capita  
Sask. population 1,045,622

Measures related to the weight of regulated electronics collected by the program for recycling.

## Access Accessibility Indicators.



Collection site coverage and events

94%



% of the Saskatchewan population within 50 kms (rural) or 30 minutes (urban) of a SWEEP collection depot



40 Total Collection Events

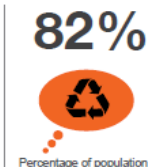
Measures related to the convenience of accessing the program to have regulated electronics recycled.

## Awareness Public Awareness and Industry Participation Indicators.



Public awareness and industry participation

82%



Percentage of population aware of program



656 Participating manufacturers, retailers and other industry members of SWEEP

Measures related to the public's awareness of the program, and the direct participation of obligated industry in the program for environmental compliance.

## Cost Financial Indicators for fiscal year Apr.1 – Mar.31.



Total program costs

\$1,863 per tonne



\$1,863 per tonne  
Total program costs per tonne



\$1,364 Operational costs per tonne

\$499 Total program costs per tonne

Measures related to the overall costs of delivering the program, including collection, consolidation, transportation, audits, processing, administration, communications, management and professional fees.



This scorecard lists the recommended and harmonized Key Performance Indicators (KPI) which each of the four regulated, industry-led electronics stewardship programs in Canada (ACES, ESABC, OES & SWEEP) will be reporting on, as per "Research and Recommendations for Performance Measures for Regulated, Industry-Led, End-of-Life Electronics Recycling Programs in Canada" (Intergroup Consultants Ltd, April 2010). Full report here: <http://estewardship.ca/docs/Performance-Measurement-Report-FINAL-2010.pdf>

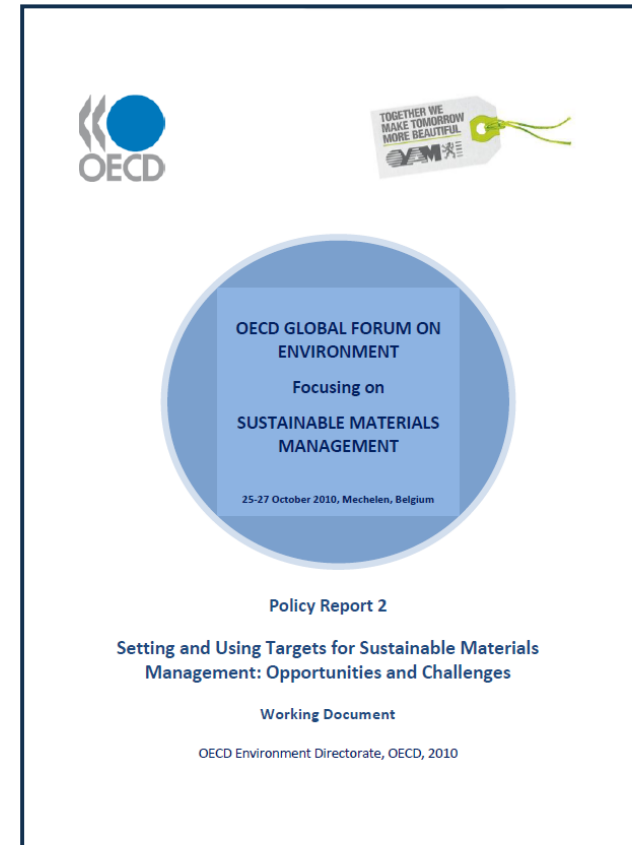
# Summary of Recommended Performance Measures (III)

Indicator	Description/Background
<b>Environmental Impact Indicators</b>	
<b><i>Trends in processing</i></b>	Include information on trends in enhanced processing and material recovery of end-of-life electronics in Canada
<b><i>Mass balancing</i></b>	Calculating total weight of regulated products collected and reporting on weights by recovered materials after processing
<b><i>Total weight of material recycled as percentage of material collected by weight</i></b>	Varying definitions of what qualifies as “recycling”, work required to define nationally
<b><i>Greenhouse gas emissions</i></b>	Defining and calculating the environmental “footprint” of our programs



# OECD Recognition

- OECD's Environment Directorate 2010 working paper on management of waste materials profiles our Canadian approach as a private-sector case study.
- *As demonstrated in Canada...there are programmes which have encouraged improved performance in a variety of areas without national targets...it appears that leveraging industry's preference for results-based management over regulation led to partnerships achieving what would have traditionally been stipulated in national targets...*



# US Industry adopts same Approach

*“...The (April 2011) ERCC publication...addresses this gap by recommending a standard set of metrics that can be used to develop a coherent baseline set of data.*

*The new ERCC performance measures document identifies the preferred performance measures that should be tracked in electronics recycling programs as soon as possible:*

- 1. net pounds collected for recycling;*
- 2. pounds collected for recycling per capita;*
- 3. total number of permanent collection sites;*
- 4. total number of mail-back programs and special collection events held annually;*
- 5. total weight recycled as percentage of weight collected.*

*Basing evaluations of state programs on these baseline measures will provide a more level playing field for relative evaluation of program types and structures. ERCC recommends that collection of these data points begin in the current or next program year, and plans to post all available metrics on the ERCC website.*



Leadership. Commitment. Responsible Recycling.

[www.eStewardship.ca](http://www.eStewardship.ca)

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