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Consistent data collection and reporting: *The role of standards in the circular economy*

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CSA Group – Standards

Standards Development

Standards promote:

- Safety
- Health
- The environment
- Economic efficiency

Research

- Explores potential for new standards solutions
- Provides evidence to inform and accelerate standards development

Education

- Provides different training options based on user needs
- Increases user knowledge of standards
- Guides the application of standards in workplaces and communities

Advocacy

- Drives awareness of standards and promotes their value
- Provides thought leadership on public policy issues important to Canadians
- Ensures standards are referenced by government and industry
- Engages a new generation of standards developers and users

What is a Standard?

- Establish minimum safety requirements that may be referenced in legislation
- Practical and easy to implement
- Written in terms that are measurable or enforceable
- Have clear and readily understood language
- Avoid ambiguity – “shall”, “should” & “may”
- Provide maximum benefit to large segment of population
- Reflect the state of the art
- Voluntary until adopted into regulation
- Discussion on revision every 5 years (minimum)

The Process

Open.

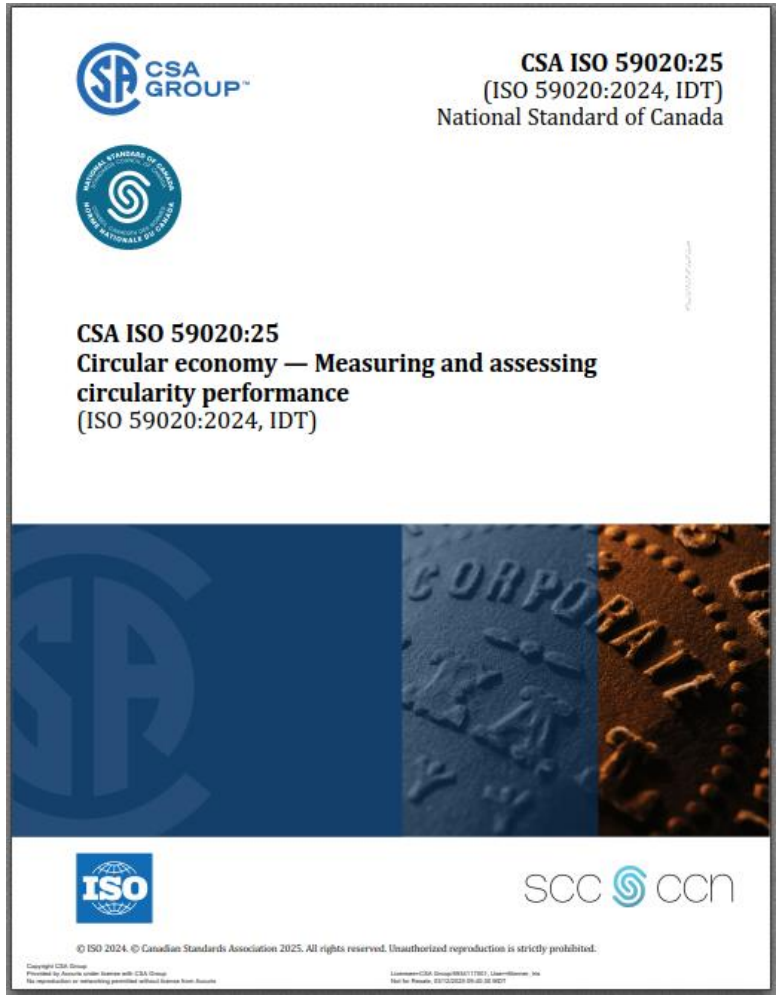
Balanced Interests.

Due Process.

Consensus.

CSA ISO 59020:25
Circular economy – Measuring and assessing circular performance

- Framework for any organization of any size in any industry
- Stage 1: *Boundary setting*
- Stage 2: *Circularity measurement and data acquisition*
- Stage 3: *Circularity assessment and reporting*



How can we apply CSA ISO 59020 to the waste management industry in Canada?

Circular economy metrics

- Jurisdictions can measure their circularity by using evidence-based indicators that assess how well resources are reused, recycled, and conserved
  - waste management
    - percentage of waste diverted from landfills
  - energy efficiency
    - proportion of renewable energy
  - water conservation
    - efficiency of water reuse systems
- Need standardized frameworks for these indicators
- CSA ISO 59020:2025: Circular economy — Measuring and assessing circularity performance

CSA ISO 59020 – Core circularity indicators

- Resource Inflows
  - Reused content
  - Recycled content
  - Renewable content
- Resource Outflows
  - Average lifetime
  - components and products that are reused
  - % recycled material derived from outflow
  - products and materials for renewable recirculation in the biological cycle
- Energy
  - % renewable energy
- Water
  - % circular sources
  - Ratio water reuse or recirculation
- Economic
  - Material productivity
  - Resource intensity index

Performance metrics that indicate circularity

Theme	Who	Indicator
Climate	Toronto	Annual tonnes of CO_2e. reduced related to solid waste system
	BCIT	Consumption-based emissions
	Metro Oregon	% of CO_2e consumption-based emissions generated with products and services consumed
Behavioural change	Rotterdam	Surveys to measure % circular behaviour of population
	RECYC-QUEBEC	% of citizens that favour purchase of bulk or low-packaging products as often as possible
Raw materials	Rotterdam	% reduction in the primary use of raw materials
Regulations	Metro Oregon	# of bylaws in place to reduce single use items
Procurement	Toronto	Annual # of procurements that include waste reduction, reuse or recycling requirements

Performance metrics that indicate circularity (cont'd)

Theme	Who	Indicator
Local innovation	RECYC-QUEBEC	# of new innovative projects supported
	Rotterdam	# of companies that contribute directly to the CE
	Rotterdam	# new circular initiatives completed
	Rotterdam	# new jobs created by CE
	Rotterdam	% total number of jobs that are circular
	Syke	# of credits (ECTS*) of circular economy courses offered in universities of applied sciences / academic calendar year
	Metro Oregon	% of collected recyclables sold to domestic markets

* ECTS is European Credit Transfer and Accumulation System

Performance metrics that indicate circularity (cont'd)

Theme	Who	Indicator
Repair/reuse	Toronto	# items repaired/repurposed at sharing and reuse spaces
	Rotterdam	% waste reused
	Toronto	Change in textile quantities in garbage bins (SF and MF residential, each in kg/unit or kg/capita)
	Richmond	# of homes relocated
	Metro Oregon	# of employees in the repair/reuse sector by material type
	Toronto	Kg of clothing repaired in sewing repair hubs
	Toronto	# bicycles repaired/refurbished at bicycle repair hubs
	Richmond	# of items repaired at repair events (including type of item, age of participants, etc.)
Waste generated	Metro Oregon	Tonnes of waste generated
	Montreal	Tonnes residential waste eliminated
	Halifax, Montreal	Kg disposed /capita
Solid waste diversion and disposal	Statistics Canada	Solid waste diversion and disposal

Performance metrics that indicate circularity (cont'd)

Theme	Who	Indicator
Recycling and composting	Richmond	Tonnes / year / materials diverted (e.g., metal, cardboard, mixed paper, plastics, glass, etc.)
	Victoria	Regional recycling data from blue box program
	Syke	Kg recycling/resident
	Recycling Council of BC	Recycling rate
	Rotterdam	% of waste composted
	Toronto	Kg/capita green cart material
	Victoria	% organics waste diversion
	Metro Oregon	% of recycling contamination by sector
	Montreal	Tonnes/year recyclable materials generated and collected
	Rotterdam	% of food wastage
	Rotterdam	Tonnes of avoidable food waste generated and disposed

Circular economy indicators

- Most evidence-based, measurable, and actionable circularity and circular economy indicators are focussed on recycling
  - recycling can be easily and reliably measured
  - other cascades are normally private sector processes that are more difficult to measure
- Second place belonged to indicators for waste prevention (“reduction/refuse”)
- Reuse does not have a standard definition in the literature and is often used as an umbrella term, covering repair, second-hand trade, refurbishing, and sometimes even rental or platform share activities

(Measuring Circularity in Cities: A Review of the Scholarly and Grey Literature in Search of Evidence-Based, Measurable and Actionable Indicators (2023))

Circular economy metrics for cities and regions

"The practical commitment to evidence-based tracking of circularity (in cities) is weak.

Practical progress towards a circular economy … will require stakeholders to strengthen and test the very small number of indicators and indicator sets that are relevant and useful for cities and regions to use for measuring their progress towards becoming more circular."

(Measuring Circularity in Cities: A Review of the Scholarly and Grey Literature in Search of Evidence-Based, Measurable and Actionable Indicators (2023))

- International Solid Waste Association's Scientific and Technical Committee (STC) commissioned CALC—Circular and Low Carbon Cities
  - One goal is an inventory of benchmarks and indicators that cities and regions could use to measure their progress towards circularity
  - Surprisingly few measurable, evidence-based indicators in use at this time

What actions are needed to develop indicators for monitoring circularity?

- Enhanced monitoring of the extraction of natural resources and the balance of renewable and virgin resources to maintain sustainable levels of natural capital
- Optimisation of consumption processes through the diversion of reusable products, components, and materials from disposal paths
- Identification, prevention, and monetising of the negative externalities of current extraction and production activities

Conclusions

- Only a tiny fraction of the massive number of publications on circular economy offer reliable circularity measurements
- Most existing city circularity initiatives are limited to making Sankey diagrams, publishing ambitions, experimenting with pilot activities, and strategizing about policies
- ***Evidence-Based, Measurable, and Actionable Indicators Are a Priority if a Circular Economy Is to Become a Reality***

(Measuring Circularity in Cities: A Review of the Scholarly and Grey Literature in Search of Evidence-Based, Measurable and Actionable Indicators (2023))

Call to action!

- Identify themes of importance
- Select actionable indicators
- What do you currently measure?
- What *should* you measure?

Proposed workshop: Data acquisition and circularity indicators for waste management

- Fall 2025
- Virtual
- Contact iris.monner@csagroup.org

Thank you.

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