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RESOURCE RECOVERY FOR A CIRCULAR ECONOMY

Summary Report
March 2020

TABLE OF CONTENTS

What is a Circular Economy	3
Benefits to the Region	3
About Lake County and the Municipalities	4
Recycling Gap Analysis Overview	5
Circular Economy: Direct Opportunity	6
Gap Analysis Results: Jobs Impact	7
Municipal Recycling Best Practices	
Gap Analysis Findings	8-9
Summary of Recommendations	10-11
How Sectors Work Together	12



INTRODUCTION

SWALCO is committed to reaching a 60% recycling rate by 2030. This includes recycling and composting of both residential and commercially generated materials.

SWALCO retained RRS to conduct a recycling system gap analysis and help launch its Circular Economy Partners program to identify resource recovery opportunities with local businesses and collectively achieve the benefits that come from closed loop materials management:

- increase recycling efficiency
- reduce GHG emissions
- reduce climate impact
- attract new manufacturing end markets
- generate economic growth
- create more sustainable green jobs.

This Summary Report highlights results and recommendations of the gap analysis, providing findings and opportunities from a regional watershed data analysis and performance assessment against established recycling best practices.

Lake County IL was the first county in the state to achieve solid waste planning. Today, SWALCO aspires to lead in the achievement of a vibrant circular economy.

What is circular economy?

The circular economy is a model for moving beyond traditional 'take-make-waste' industrial processes to extract the maximum value during use of a material and avoid landfill of materials that could be reused or recycled to make new products. Benefits of circular, closed-loop materials management are realized at the scale of the local economy.

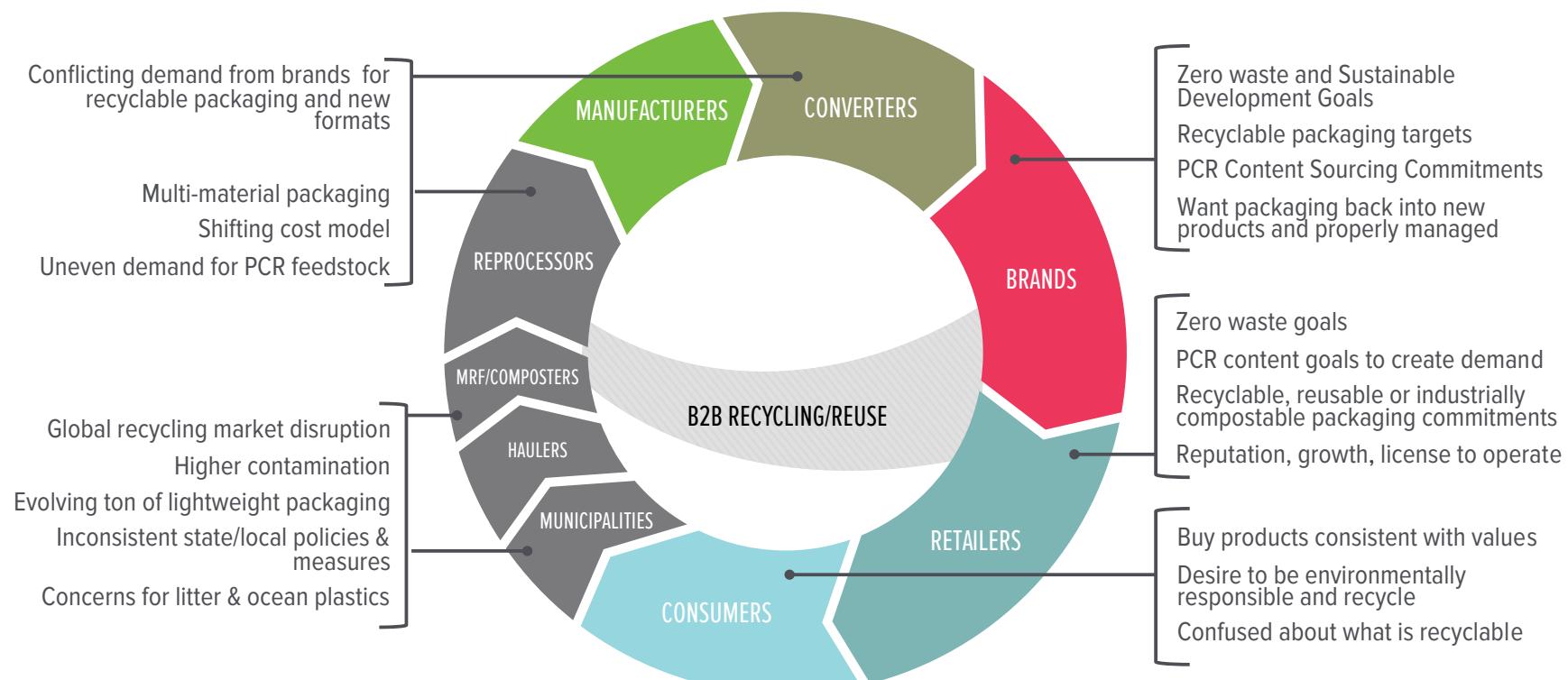
Benefits to the region

Economic opportunity – Drive job creation. Recycling can replace one landfill job with approximately 11 manufacturing jobs.

Landfill diversion – promote sustainable land use by conserving landfill space for those materials that don't have recovery options.

Reduced carbon emissions – using recycled content feedstock for local manufacturing and infrastructure produces 50-75% fewer greenhouse gas (GHG) emissions than using virgin materials (plastic, paper, cement, metal or aluminum).

CIRCULAR ECONOMY: GOALS & CHALLENGES FOR KEY PLAYERS:



About Lake County and the municipalities

Lake County is situated in the northeast corner of Illinois along Lake Michigan. The County has a total area of 1,368 square miles and is the third-most populous county in Illinois. Even though Lake County in general enjoys a higher income level and a lower poverty rate, they vary greatly from community to community and among different races and ethnic groups. The county's communities include rural communities, highly developed urban centers, and tourist communities.

SWALCO members include Lake County, 43 communities in the County and Great Lakes Naval Academy. Great Lakes is the largest technical school training center and the largest overall training center in the Navy. Great Lakes is a "city" within the City of North Chicago with an average population of over 20,000 at any given time.



RECYCLING SYSTEM GAP ANALYSIS OVERVIEW

Scope

RRS identified six areas of best practice that function interdependently in a high performing, hub-and-spoke recycling system:

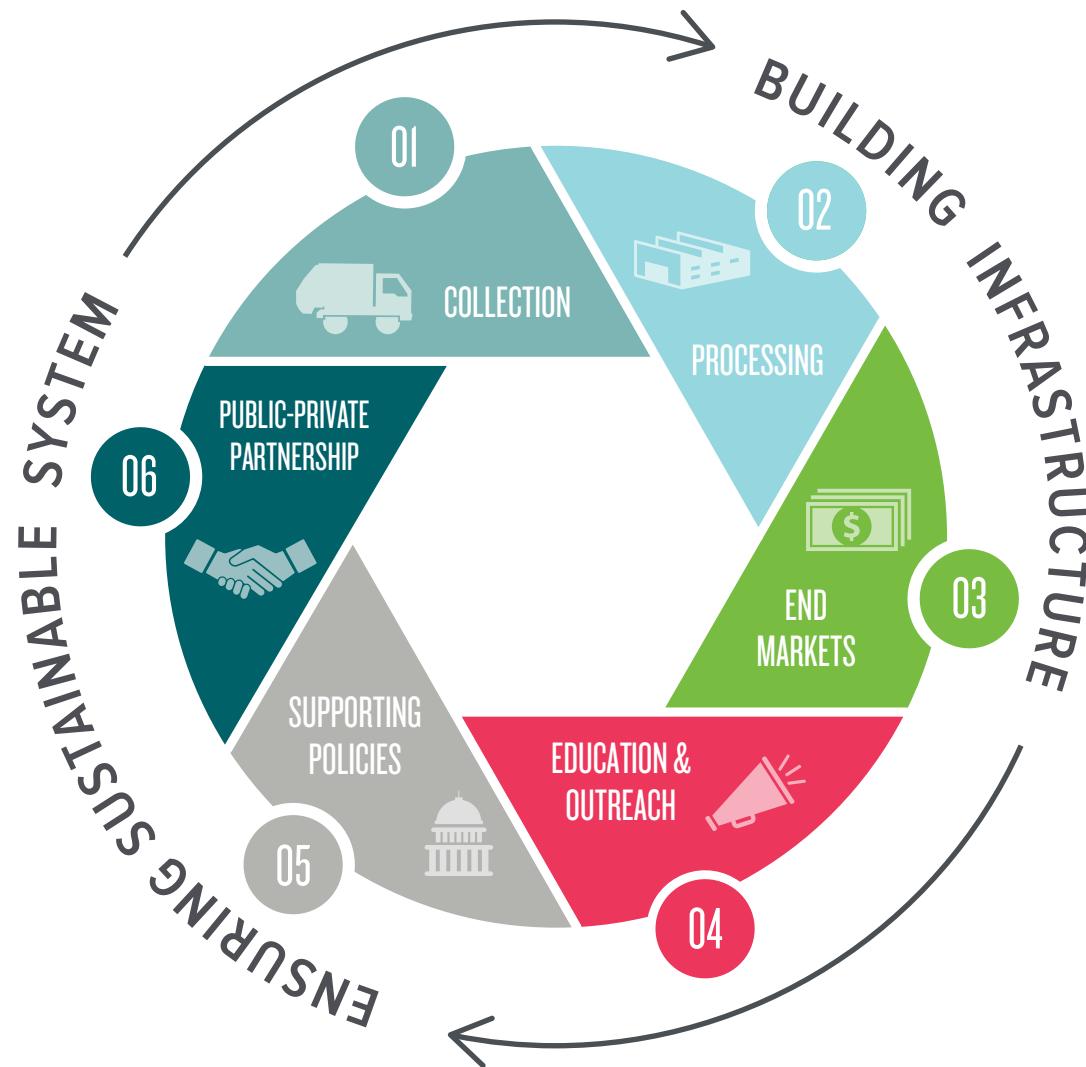
1. Collection
2. Processing
3. End Markets
4. Education & Outreach
5. Supporting Policies
6. Public-Private Partnership

RRS benchmarked SWALCO's current municipal recycling programs and diversion data against recycling best practices. Specific gaps were identified that are opportunities for targeted investment to improve recovery, recycling market development, and partnerships.

SWALCO:
43 municipalities
Unincorporated Lake County
Great Lakes Naval Training Center

THE HUB-AND-SPOKE RECYCLING MODEL

is the most efficient, cost effective approach. The centralized processing center, or hub, is where recyclables are sorted, baled and sold to market. The spokes are the surrounding communities that feed the recyclables they collect to the main hub.



FOCUS MATERIALS

PAPER



PLASTICS



METAL



GLASS



ORGANICS



CIRCULAR ECONOMY: DIRECT OPPORTUNITY

Recovering SWALCO planning area focus materials

Disposed tonnage of recyclables represents lost material value. If SWALCO focused on recovering disposed recyclables, the region would avoid throwing away approximately \$31M of additional recyclables annually, and instead provide a significant investment opportunity for local recyclers and manufacturing. Recycling and recovery of this material can provide a total direct economic opportunity valued at \$43.1M annually.

Opportunity tons (Focus material currently disposed)	269K
Commodity Value (based on 5-yr regional average)	\$31 M
Disposal Cost (\$45/ton)	\$12.1 M
Total Annual Economic Opportunity	\$43.1 M

\$43.1 MILLION

a significant economic opportunity!

GAP ANALYSIS RESULTS: JOBS IMPACT*

Recycling and recovery of the 269K tons of focus materials has potential to create 3,036 new recycling jobs

1,518
direct jobs

+

1,518
indirect jobs

DIRECT JOBS

Collection, processing and manufacturing activities will yield the opportunity to create approximately 1,674 direct new jobs. This combined with the loss of 156 disposal jobs provides a net gain of 1,518 jobs.

MULTIPLIER EFFECT

For every green job directly created, an equal or greater number of jobs are indirectly generated in the businesses that supply goods and services to the recycling sector or are induced through typical consumer behaviors of these workers. A conservative estimate forecasts that the recovery of the currently disposed focus materials will yield an additional 1,518 jobs through indirect and induced impacts.



FOCUS MATERIAL	COLLECTION & PROCESSING JOBS	MANUFACTURING JOBS
Aluminum Cans	17	84
Glass (Mixed)	35	75
Paper (Mixed Paper)	73	83
Paper (OCC)	193	219
Paper (Newsprint)	11	12
Plastics (PET & PE)	155	436
Steel Cans	35	39
Food Waste & Mixed Organics	207	-
SUBTOTAL	727	947
Less Disposal Jobs	-156	-
TOTAL	571	947

*Jobs are based on the opportunity tons if recycled.

MUNICIPAL RECYCLING BEST PRACTICES: GAP ANALYSIS FINDINGS

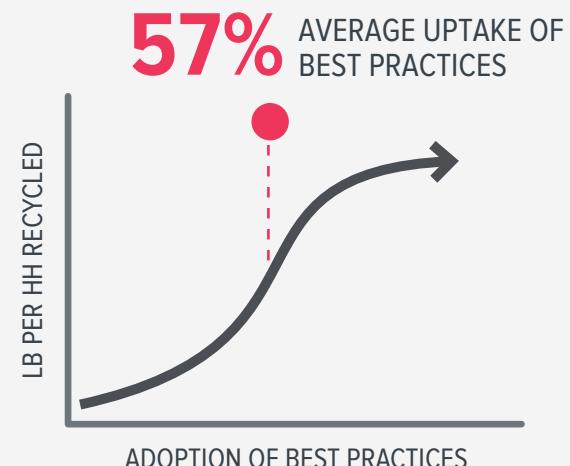
PAGE 1 OF 2



* 30.7% residential diversion is based on residential curbside recycling, food scraps and yard waste data from 187,511 households in the region. Adjusted for recycling residue.

** 39% total diversion is based on reported recycling and composting from commercial, residential, and C&D sectors in the region. Adjusted for recycling residue rates.

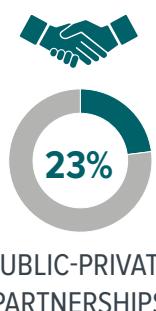
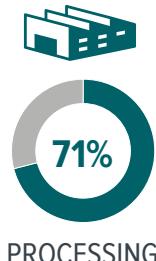
BEST PRACTICE UPTAKE PERCENTAGE (% UPTAKE VS. LBS/HH)



WHERE DO WE STAND? BENCHMARK COMPARISON TO OTHER US REGIONS

Use of recycling best practices results in larger quantities of materials being recycled as measured in lbs. per household. SWALCO's adoption of residential best practices is **on par with other US municipalities.**

RELATIVE PERCENT UPTAKE FOR EACH BEST PRACTICE AREA

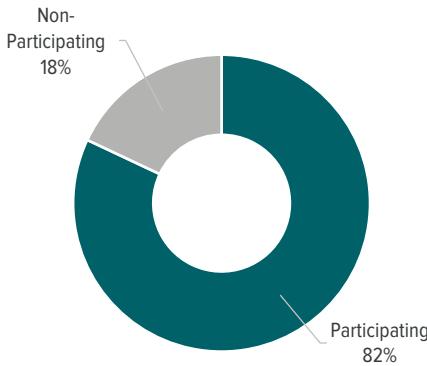




COLLECTION

- Multi-family
- Commercial
- Away from Home Collection
- Carts
- Single Stream
- Curbside
- Weekly Collection
- High Capacity Vehicles
- Automated Vehicles
- MRF Access
- Transfer station Access
- C&D Ordinance
- Yard Waste
- Residential Food Waste
- Commercial Food Waste

Estimated curbside household participation rate



PROCESSING

- MSW Transfer to landfill
- MSW direct hauled to landfill
- MRF can process additional materials
- MRF/Transfer Station within 10 miles
- MRF residue below 10%
- Processing contract
- Multiple MRFs available

1,993 Lbs/HH/YR Landfilled
643 Lbs/HH/YR Recycled
241 Lbs/HH/YR Organics Recovered (yard waste)
\$45 MSW Tipping Fee



SUPPORTING POLICY

- Mandatory Recycling Ordinance
- Multi-family Recycling Ordinance
- Enforcement
- Mandatory Recycling Legislation
- Landfill Ban
- Pay-As-You-Throw Program
- Revenue Sharing
- Franchise Agreement
- Tax Based Funding
- Fee Based Funding
- Recycling Costs Embedded in Disposal



END MARKETS

- Contracted Hauler
- Commodity Destination Knowledge
- Additional Materials to Recover
- Bale and Ship Directly
- # of SS MRFs in Region (3+)
- Options and access to local market



PUBLIC PRIVATE PARTNERSHIPS

- State Grant Funding Available
- Partnered with Other Municipalities on Grant Projects
- Utilizes Industry Partnerships
- Utilizes TRP Grant Program
- Utilizes Closed Loop Fund Resources
- Regional Economic Development Tools Available



EDUCATION & OUTREACH

- Website with Educational Materials
- Keep America Beautiful Programs
- The Recycling Partnership
- Recycle Rewards/Recycle Bank
- Using Recycle Coach, ReCollect or similar app
- Annual Education spend greater than \$1/HH

Annual education and outreach budget: **Less than \$1/HH per year.**

OPPORTUNITIES

The gap analysis discovered over 30 opportunities. Key opportunities:

Invest in outreach to multi-family, food scrap and construction and demolition generators.

Develop incentives and recognition for commercial generators to recycle, track and report data on quantities.

Clean up single stream – better sorting from home.

Catalyze adaptation of facilities and supply chain to recycle today's most prevalent packaging - encourage competition for MRF processing, preserving large consolidated tonnage to attract end markets.

Leverage SWALCO's internal program strength through a focus on industry partnerships to create local packaging recovery value chains.

SUMMARY OF RECOMMENDATIONS

A major outcome from the gap analysis is a summary of prioritized action items developed as a result of this work.

RECYCLING BEST PRACTICE AREA				
	EDUCATION & OUTREACH	COLLECTION & PROCESSING	SUPPORTING POLICIES	PUBLIC-PRIVATE PARTNERSHIPS
TIMEFRAME				
Short-term	Community-based Social Marketing Campaigns	Ensure Recycling Processing Capacity Expand Food Scrap Collection	Enhance and Develop Incentive-based Programs	Circular Economy Partner Program
Mid-term	Demand Champion Procurement Campaign	Engage Public Private Partnership to Implement Circular Economy	Mainstream Circular Economy Principles Into Policy Levers	Strategic Coordination and Collaboration to Develop End Markets
Long-term	Campaign Refresh	Facilitate and Evaluate Launching a Re-manufacturing Institute	Facilitate Recycling End Market Development Locally	Identify Feedstock Opportunities Among Partners

TOP 5 RECOMMENDATIONS & INSIGHTS

1 SUPPORT, DEVELOP, AND BUILD CAPACITY AND END MARKETS

- Secure long term and cost effective recycling processing capacity.
- Engage MRFs, secondary processors and end markets in SWALCO's interest in implementing circular economy principles through public-private partnership to optimize material inclusion and recycle the current ton of recyclables.
- Facilitate recycling end market development locally

2 LEVERAGE INDUSTRY PARTNERSHIPS

- Develop a Circular Economy (CE) Partners program to create a network for expanded regional planning through cross-sector collaboration to improve material recovery.
- Develop a focused action plan for expanding commercial sector participation.
- Develop a data clearinghouse to consolidate locally available, commercially generated materials.

3 SUPPORT PREVENTION/REUSE/REMANUFACTURE STRATEGIES AND INFRASTRUCTURE

- Support repair hubs.
- Enhance byproduct synergies.
- Facilitate and evaluate launching a remanufacturing institute.

4 EDUCATE, ENGAGE AND OUTREACH

- Implement community-based social marketing to improve environmental impacts. Create a food reduction campaign and other targeted campaigns.
- Develop a Demand Champion Procurement Campaign to support recycled product end markets.
- Collaborate with government departments to lay a framework for strategic coordination to attract end market development.

5 FISCAL MEASURES AND FINANCIAL SUPPORT

- Develop supportive policies and incentives to encourage use of circular economy criteria and procurement.
- Encourage procurement policies that optimize for quality, cost, and post-consumer recycled content products.
- Encourage market development through current forms of financial assistance or create new incentives to support businesses.

HOW SECTORS WORK TOGETHER

Public and private sector leaders need to work together and within their networks to continually improve practices and achieve measurable increases in recovery. This involves identifying circular economy champions from local governments, commercial businesses and institutions, schools, elected officials, the recycling industry and manufacturing.

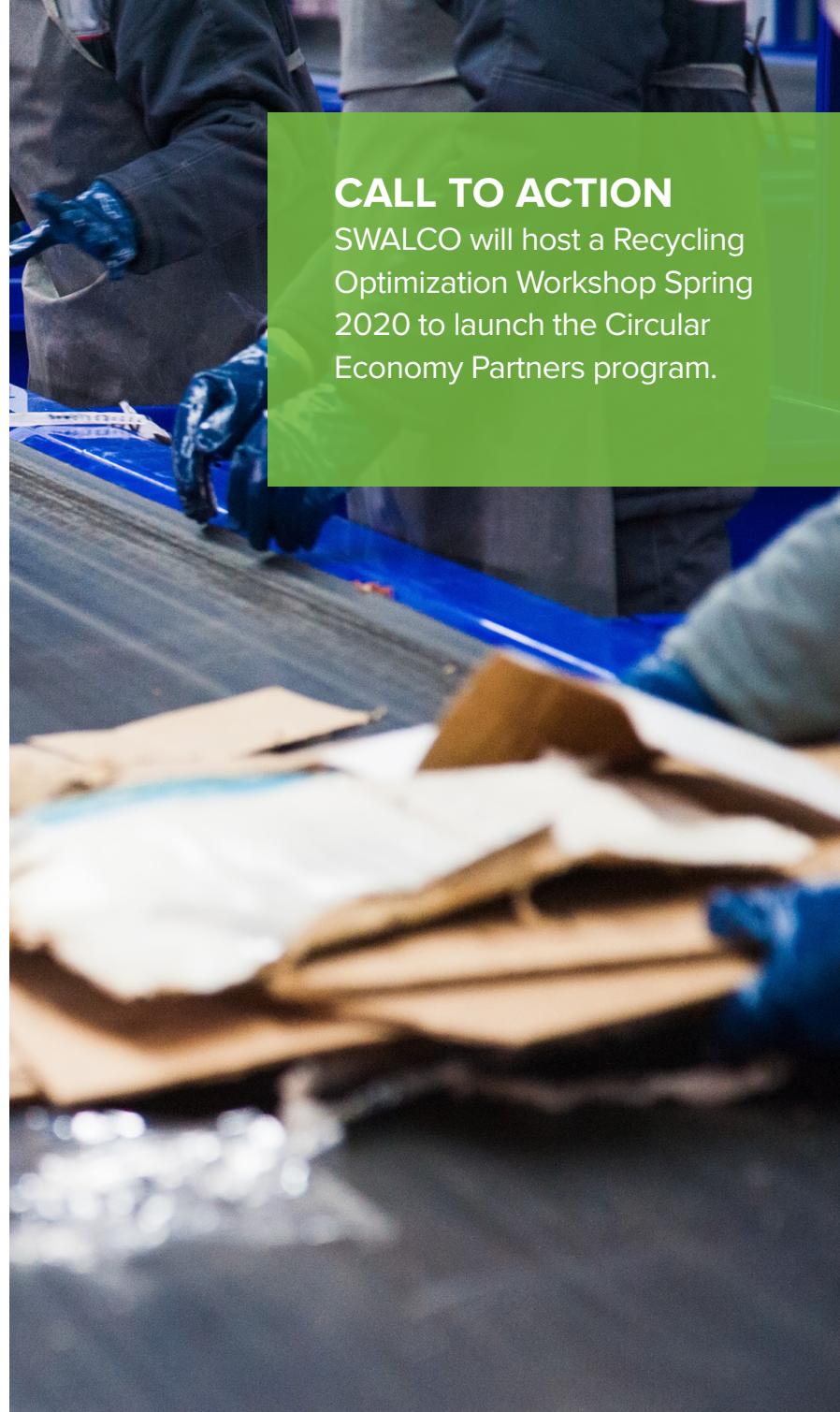
LOCAL GOVERNMENTS – Collect, report, recognize, and incent recycling and recovery progress in their county or municipality against publicized, measurable targets. Facilitate regional cooperation to set and achieve goals through collective action. Focus on strong multi-stakeholder engagement that leads to policies on mandatory recycling and use of post-consumer materials in infrastructure projects wherever performance and cost supports feasibility.

COMMERCIAL BUSINESSES, SCHOOLS AND INSTITUTIONS – Report data on recyclables available for collection to municipalities to achieve critical mass that will in turn attract private and public investment in optimized hub-and-spoke recycling. Help recruit other businesses to participate, become local champions, and drive recycling message outreach via their communication outlets.

ELECTED OFFICIALS – Understand recycling economics and recognize recycling is a value-add service to your constituents. Support building recycling program capacity in your communities to become part of the regional hub-and-spoke system.

RECYCLING INDUSTRY – Assist with community education (including transparent reporting on material processed), leverage your strong base in relationship building, provide market data and support local sustainability policy and incentives. Educate customers to facilitate better understanding of recycling economics and how to recycle with simple, easy to understand and up-to-date communication methods.

RECYCLED CONTENT PRODUCT MANUFACTURERS – Engage with local communities on shared goals; provide investment and recycling process expertise alongside granting organizations such as The Recycling Partnership and Closed Loop Partners.



CALL TO ACTION

SWALCO will host a Recycling Optimization Workshop Spring 2020 to launch the Circular Economy Partners program.