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# **PRIORITY INDUSTRIES FOR A CIRCULAR ECONOMY IN CANADA**

Adapted by **Sonia Cyrus Patel**  
and **Genevieve Donin**

Based on analysis by **Yves Richelle**,  
**Henri Thibaudin** and **Jérôme Larivière**,  
**DAMECO**

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# Priority Industries for a Circular Economy in Canada

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## 1. Introduction

The circular economy provides an alternative to the traditional linear ‘take-make-waste’ economy. In its ideal, it is a sustainable, productive economic model that is financially, environmentally and socially sustainable. It is characterized by highly efficient use of resources and a continuous recirculation of post-consumer materials while using renewable energy. It operates in a continually evolving cycle. Waste is designed out of the system, and is returned to production through reuse and recycling of materials. It does this without depleting resources and can be perpetuated indefinitely without any accumulation of waste in the environment.<sup>1</sup>

Although many applied circular economy practices are familiar and present in Canada, it is in a fragmented model. At present, there is no national guiding circular economy vision, nor integrated national policy framework to support the uptake and diffusion of the circular economy, although pockets of policy interest have been emerging provincially, municipally, sectorally, and in civil society.

The circular economy cannot be achieved using a one size fits all approach. Policy options to drive circularity differ significantly by sector as they each face distinct barriers and opportunities. Hence, a key first step to develop a national strategy is to assess and identify which industries and sectors of the economy could reap the greatest benefits of becoming more circular.

Currently, there is no set methodology to conduct this assessment. Different jurisdictions and academics have developed unique quantitative, qualitative methodologies, or combination thereof – based on their contextual circumstances and requirements.

This report builds on the quantitative methodology initially developed for Quebec in 2018 by Yves Richelle for L’Institut EDDEC,<sup>2</sup>. It presents a preliminary economic analysis to identify high potential industries in Canada, its territories and provinces based on popular circular initiatives taking place globally. The circular initiatives considered in this analysis were shortlisted based on the literature review used for the 2018 study, and the economic importance of the products and industries at the core of these initiatives were evaluated using Statistic Canada’s latest Supply and Use tables.

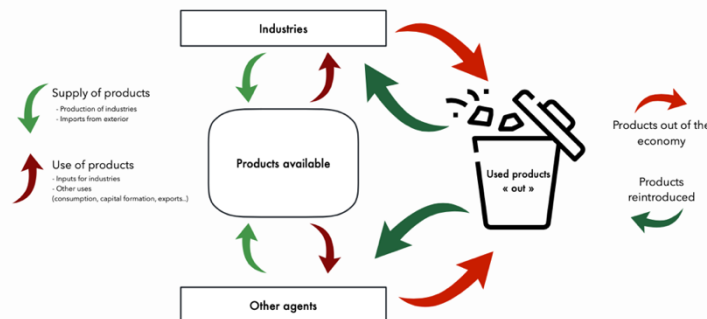


Figure 1: Supply and Use Principles

<sup>1</sup> Ellen MacArthur Foundation (2013). [Towards the Circular Economy: Economic and business rationale for an accelerated transition.](#)

<sup>2</sup> S. Teigeiro, L. Sollar-Pelletier, S. Bernard, M. Joanis and D. Normandin (2018). [Circular Economy in Quebec: Economic Opportunities and Impact.](#) See pages 40-41.

The detailed methodology used to conduct this analysis is outlined in Section 2- methodology. Section 3 of the report presents key findings – including the characteristics of the circular initiatives selected, the economic value of the products used in these initiatives as well as the economic value of the industries associated with those products in Canada. These results are summarized in the final conclusion section.

This report does not claim to offer definitive recommendations on which industries and sectors should be prioritized for circular economy policies in Canada, as other methodologies might lead to different conclusions. Rather, it hopes to act as a steppingstone for further deliberations with key stakeholders and sectoral experts.

## 2. Methodology

The broad methodology used in to conduct this analysis is depicted in Figure 2, below.

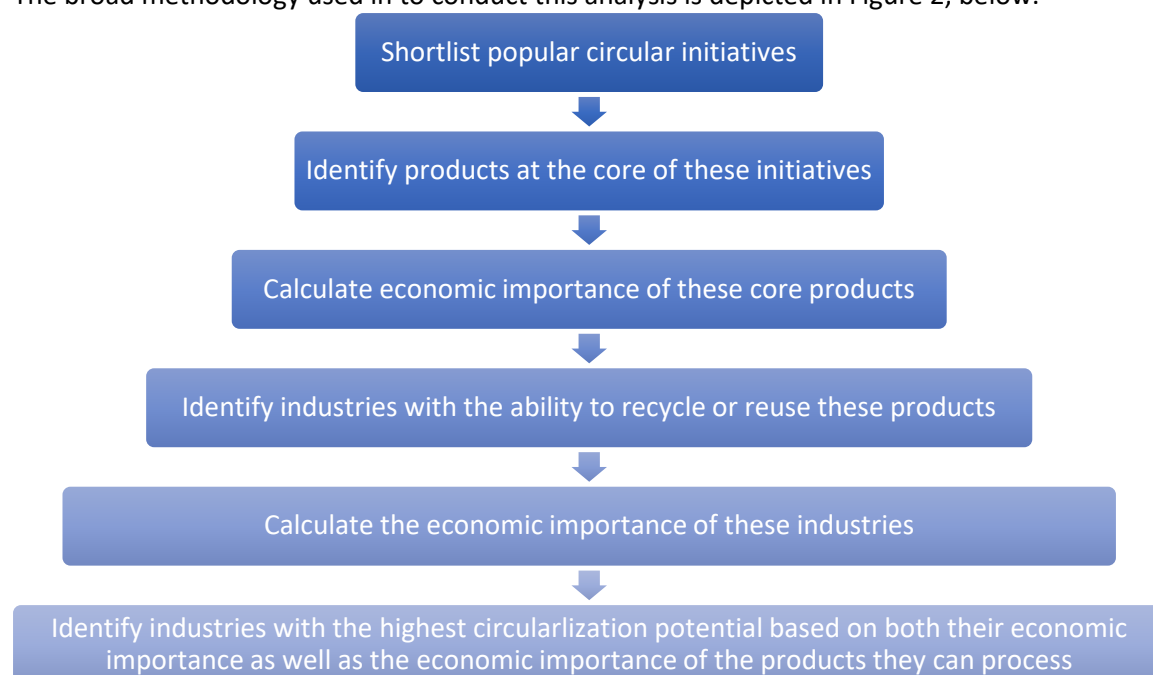


Figure 2: Methodology

### 2.1 Identifying Core Products used in Selected Circular Initiatives

In order to identify high potential industries for a circular economy in Canada, the first step in the methodology was to shortlist popular circularity initiatives taking place globally. This shortlist was pulled from a pre-existing review of 12 studies (Listed in Box 1) conducted by S. Teigeiro et al on behalf of Institut de l’environnement, du développement durable et de l’économie circulaire (I-EDDEC), for their research titled “Circular Economy in Quebec: Economic Opportunities and Impact”.<sup>34</sup> The initiatives identified in their review also form the basis of the analysis in this report.

Next, the core products used in these initiatives were identified and their NAPCS classification was found. These are listed in Table 1 found in Section 3.1 of this report. Finally, the circularization potential of industries related to these initiatives in Canada was determined by calculating their

<sup>3</sup> S. Teigeiro, L. Sollar-Pelletier, S. Bernard, M. Joanis and D. Normandin (2018). [Circular Economy in Quebec: Economic Opportunities and Impact](#).

economic importance as well as the economic importance of the products at the core of these initiatives.

### Box 1: Studies that form the basis of the analysis in this report

1. A. Wijkman et K. Skånberg (2015). **The Circular Economy and Benefits for Society: Jobs and Climate Clear Winners in an Economy Based on Renewable Energy and Resource Efficiency.** *Club of Rome.*
2. Ellen MacArthur Foundation, McKinsey, et Stiftungsfonds für Umweltökonomie und Nachhaltigkeit (SUN) (2015). **Circular Economy Report - Growth Within.** *Ellen MacArthur Foundation.*
3. D. Dr. Hogg *et al.*, (2014). **Impact Assessment of Options Reviewing target in the Waste Framework Directive, Landfill Directive and Packaging Waste Directive.** *Eunomia*
4. K. Lawton *et al.*, (2013). **Opportunities to business of improving resource efficiency.** *Bio Intelligence Service & Amec*
5. Technopolis Group, Fraunhofer ISI, thinkstep, et Wuppertal Institute (2016). **Regulatory barriers for the Circular Economy: Lessons from ten case studies.** *Technopolis Group*
6. H. Oakdene (2011). **The Further Benefits of Business Resource Efficiency.** *Final report SPMT09-070*
7. Ellen MacArthur Foundation (2015). **Potential for Denmark as circular economy. A case study from: delivering the circular economy - A toolkit for policy makers.** *Ellen MacArthur Foundation*
8. Cambridge econometrics et Bio Intelligence Services (2014). **Study on modelling of the economic and environmental impacts of raw material consumption : final report.** *Luxembourg, Technical report 2014-2478*
9. SITRA et McKinsey (2015). **The opportunities of a circular economy for Finland.** *Sitra, Helsinki, Finland, ISBN 978-951-563-938-7*
10. K. Pratt et M. Lenaghan (2015). **The carbon impacts of the circular economy: Technical report**
11. J. Morgan et P. Mitchell (2015). **Green Alliance Employment and the circular economy.** *Summary ISBN 978- 1-909980-35-8*
12. European Environment Agency (2014). **Well-being and the environment. Building a resource-efficient and circular economy in Europe.** *European Environment Agency*

## 2.2 Determining the Economic Importance of Core Products

The next step was to determine the economic importance of core products by calculating the total value of the product acquired by industries, households and the public sector in a year. The output of this calculation indicated the economic importance of the core product in a jurisdiction. The larger the value of the quantities, the larger is the economic importance of the product in the jurisdiction.

The total value of the product in a given year was calculated using the following pieces of information from Statistic Canada's – 2016 Supply and Use tables:

- Value of the quantities of products made available in the economy, either through local production or imports (found in the Supply table)
- Value of the quantities of products used in the economy, either by local production, local final consumption or by users outside the jurisdiction (found in the Use table)

For the purpose of this analysis, a product (produced domestically or imported) is considered available in a jurisdiction if it is used by either:

- local industries – as input for production or investment
- private households – as consumption
- local public sector – as consumption or investment

For example, used oil is considered available in a jurisdiction when a positive amount of oil is observed to be acquired by local industries, private households or the local public sector during a reference year.

The full result of this assessment, for each product listed in Table 1, is presented in Appendix 1. Where a product did not appear in Supply and Use tables, its closest product category was used as a proxy.

### 2.3 Determining the Economic Importance of Related Industries

Next, the economic importance of industries, which have the ability to reprocess the core products, was determined. It was assumed that an industry is able to reprocess used core products if it produces this particular product, as reprocessing requires the same skills and production capabilities (e.g. food can be reprocessed by food industry). The identified industries are presented in Table 1 of Section 3.1 of this report.

The economic importance was assessed by extracting the gross domestic product (GDP) of the industries for each jurisdiction from the Statistic Canada's – 2016 Supply and Use tables. The results of this assessment are presented in Appendix 2. These results were further analyzed from the following two perspectives:

- the relative importance of an industry within each jurisdiction (presented in Appendix 3)
- the distribution of the industries national GDP across provinces and territories (presented in Appendix 4)

### 2.4 Limitations

The analysis acknowledges the following limitations in its methodology:

- The initiatives that form the basis of the analysis do not necessarily represent the full set of circular initiatives possible
- The measures of economic importance used are quite basic:
  - The economic importance of products is determined based on the value of the quantities rather than physical quantities of the products
  - The economic importance of industries is determined based on the whole GDP of the industry assumed to be capable of reprocessing the products. However, there is no guarantee that these industries possess this ability and, where they do, there is further no guarantee that this ability is positively linked to their GDP
- Finally, no assessment was conducted on the potential economic impacts of these initiatives on the jurisdictional economies, which could be either positive or negative

## 3. Findings

### 3.1 Characteristics of Circular Economy Initiatives

The key characteristics of the initiatives identified in the literature review are presented in Table 1 below. These include:

- Core product: name or nature of the product at the heart of the initiative
- Process: the circularization process required to reintroduce the product into the economic system
- Industry: the name of the industry with the ability to process the core products
- Use of processed product: name or nature of the product resulting from the process

It was found that all the initiatives focused on reintroducing used products within the economic system used processes such as recycling or reusing.

*Table 1: Characteristics of Initiatives*

<b>Core Product</b>	<b>Process</b>	<b>Industry</b>	<b>Use of processed product</b>
Palladium	Recycling	Mining and quarrying (except oil and gas)	Catalytic converter
Copper	Recycling	Mining and quarrying (except oil and gas)	Copper for new products
Steel and steel semi-steel products	Recycling	Primary metal manufacturing; and Fabricated metal product manufacturing	Steel for new products
Batteries in electrical products	Recycling	Electrical equipment, appliance and component manufacturing	New batteries
Medical equipment: MRI, CT and X-ray	Reusing	Computer and electronic product manufacturing	Refurbished medical equipment
Manure	Reusing	Animal production and aquaculture	Fertilizer
Food	Reusing	Food manufacturing	Food for animals or given to help centers
Plastic products	Recycling	Plastics and rubber products manufacturing	New plastic products
Used building materials	Reusing	Construction	New building materials
Used Oils	Recycling/ Reusing	Petroleum and coal product manufacturing	Other refined petroleum products - Heating oil
Residual packaging: Wood, paper and cardboard	Recycling	Wood product manufacturing; and Paper manufacturing	Various products
Electrical and electronic waste	Reusing	Electrical equipment, appliance and component manufacturing; and Computer and electronic product manufacturing	Refurbished electrical and electronic products

### 3.2 Economic Importance of these Core Products

In 2016, industries, local consumers and the public sector in Canada cumulatively acquired \$ 245.7 billion of the core products that were identified from the shortlist of popular circular initiatives globally. The core products with the highest economic importance for Canada were found to be food (31%); used building material (23%); steel and steel and semi-steel products (17%); and plastic products (10%). See Figure 3.

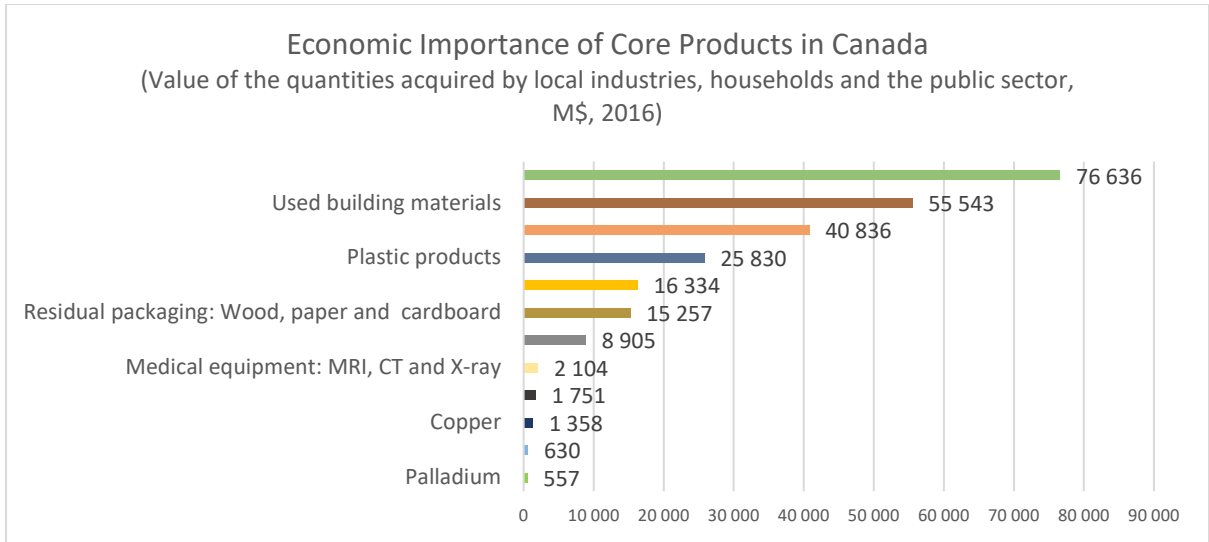


Figure 3: Economic Importance of these Core Products in Canada

The largest shares of these core products were acquired by Ontario (41%), Quebec (21%), British Columbia (17%) and Alberta (11%). See Figure 4.

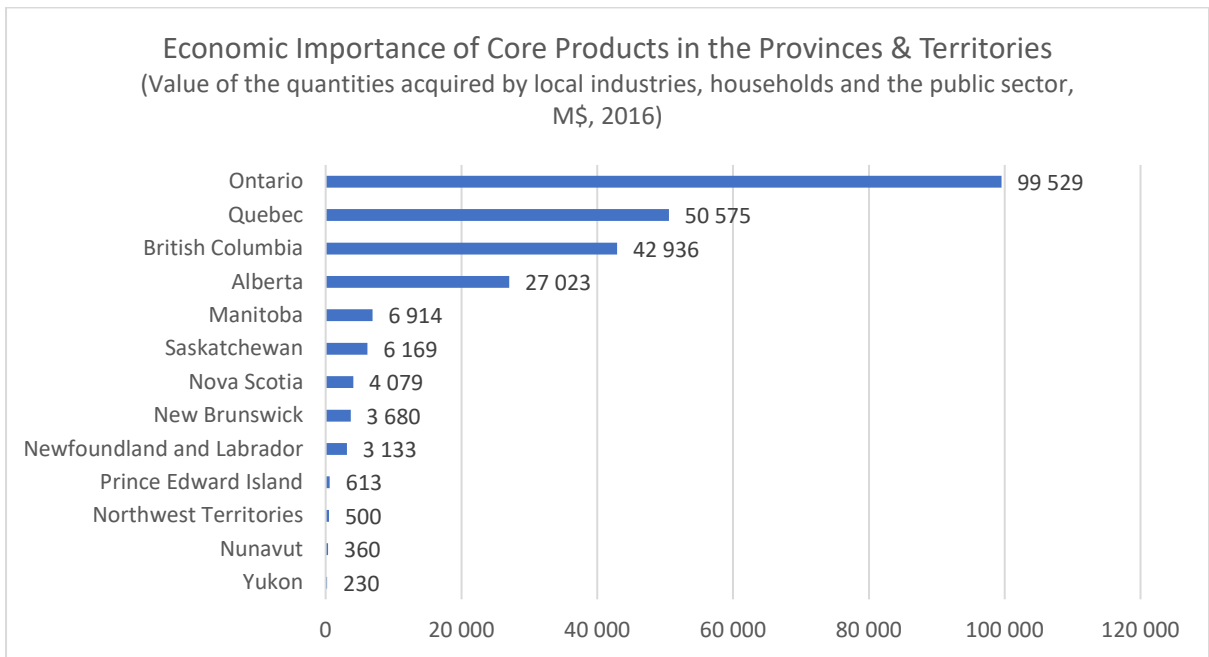


Figure 4: Economic Importance of these Core Products in the Provinces and Territories

Similar to the national level, food; used building material; steel and steel and semi-steel products; and plastic products were also observed to have high economic importance at the provincial and territorial level, along with electrical and electronic waste, residual packaging and used oils. The four core products with the highest economic importance for each province and territory are depicted in Figure 5.

Rank	Nunavut	Quebec	Northwest Territories	British Columbia	Ontario	Alberta	Saskatchewan	Manitoba	Yukon	Newfoundland and Labrador	New Brunswick	Nova Scotia	Prince Edward Island
1	Used building materials	Food	Used building materials	Used building materials	Food	Food	Food	Food	Used building materials	Food	Food	Food	Food
2	Steel and steel and semi-steel products	Steel and steel and semi-steel products	Food	Food	Steel and steel and semi-steel products	Used building materials	Used building materials	Used building materials	Food	Used building materials	Used building materials	Used building materials	Used building materials
3	Electrical and electronical waste	Used building materials	Used oils	Steel and steel and semi-steel products	Plastic products	Steel and steel and semi-steel products	Steel and steel and semi-steel products	Steel and steel and semi-steel products	Electrical and electronical waste	Steel and steel and semi-steel products	Residual packaging: Wood, paper and cardboard	Steel and steel and semi-steel products	Residual packaging: Wood, paper and cardboard
4	Food	Plastic products	Steel and steel and semi-steel products	Electrical and electronical waste	Used building materials	Plastic products	Electrical and electronical waste	Plastic products	Used oils	Used oils	Plastic products	Plastic products	Steel and steel and semi-steel products

Figure 5: Core Products with Highest Economic Importance in the Provinces and Territories



Due to the unavailability of data on how much of the core products used in the jurisdictions become waste over time, it is assumed that the higher the value of the product, the larger is its prevalence in that jurisdiction. This prevalence indicates the potential quantity of the product that could become either waste, or available to process and reintroduce into the economy.

However, for industries with the ability to reprocess waste, it is proposed that they must be of a large enough size as measured by their contribution to Canada’s GDP (at least 25%) to meaningfully influence circular economy practices. Under this assumption, the provinces where the industries linked to the products with the highest economic importance operate emerge to be Ontario (food; used building materials; steel and steel and semi-steel products; plastic products) and Québec (steel and steel and semi-steel products; plastic products). See Appendix 4.

### 3.3 Economic Importance of Related Industries

In 2016, the total GDP of industries assumed to have the capability to reprocess core products in Canada was \$ 277 billion, representing 14.7% of national GDP that year. The sectors with the highest GDP were found to be construction (52%) and manufacturing (34%). At the industry level, the economic importance of the construction industry is followed by primary and fabricated metal manufacturing (9.5%), food manufacturing (9%) and mining and quarrying (8%). See Figure 6.



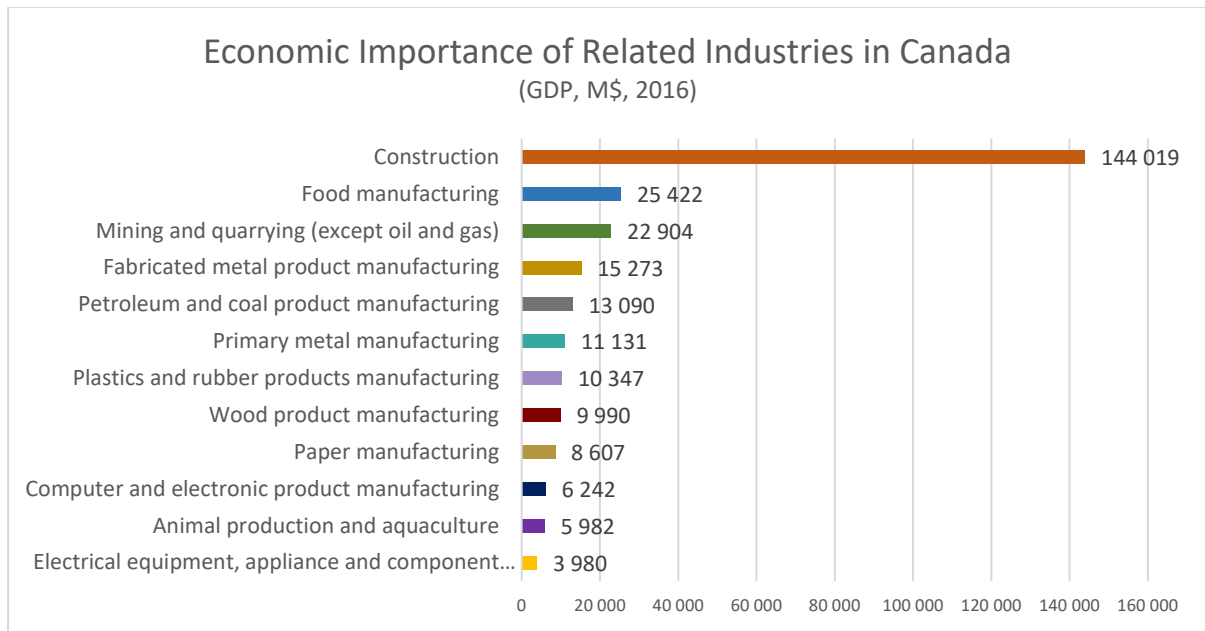


Figure 6: Economic Importance of Related Industries in Canada

The provinces where the largest shares of the considered industry's GDP were generated, emerged as Ontario (35%), Quebec (21%), Alberta (16%) and British Columbia (13%). See Figure 7.

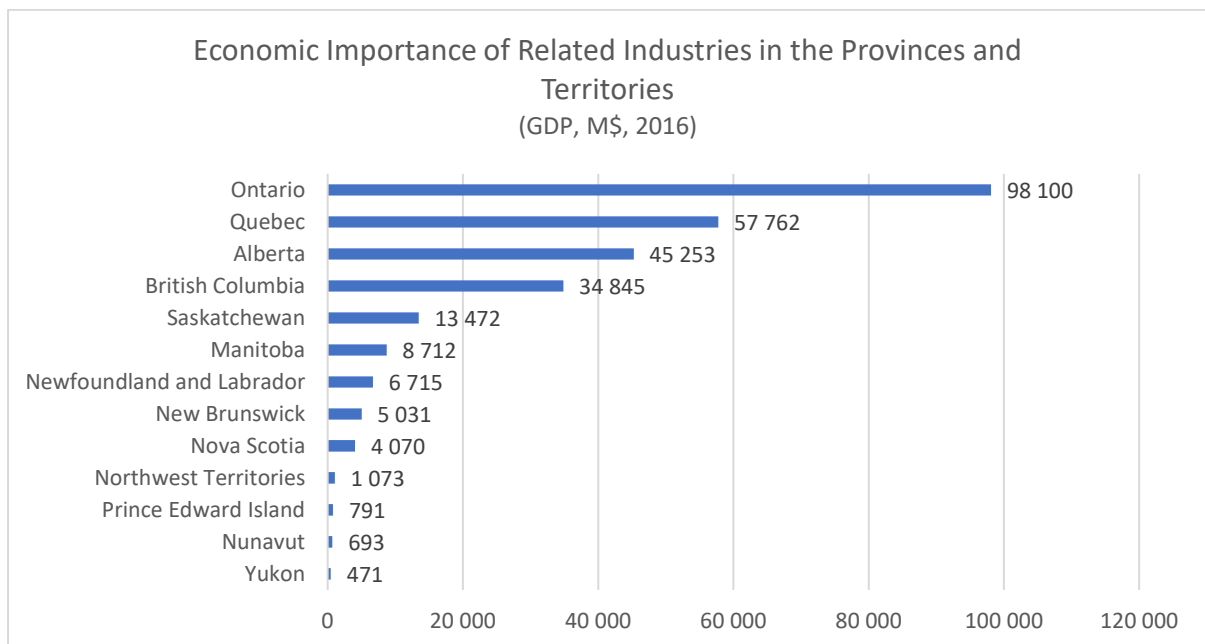


Figure 7: Economic Importance of Related Industries in the Provinces and Territories

Similar to the national level, the construction industry is observed to have the highest economic importance of the considered industries in all the provinces. However, in Canada's three territories, the mining and quarrying (except oil and gas) industry were seen occupying the top spot. See Figure 8.

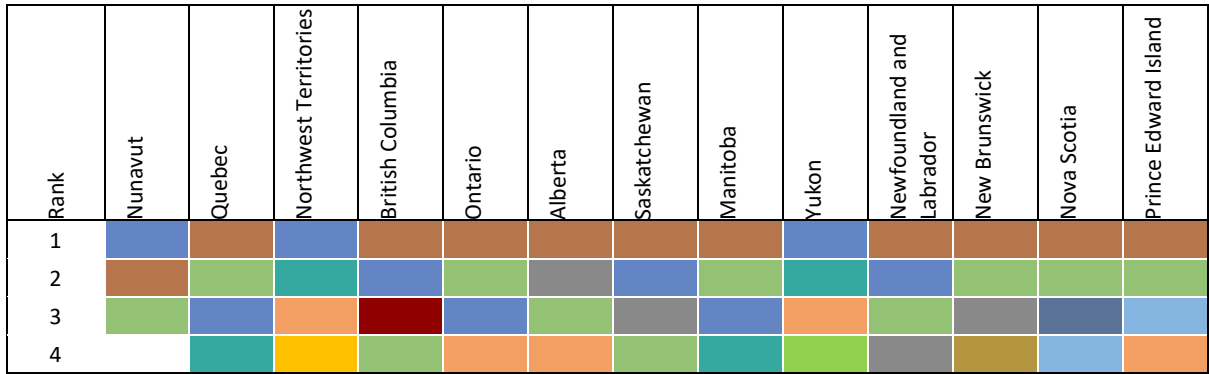
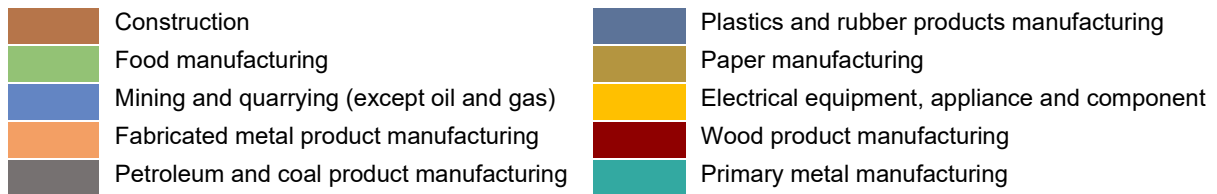


Figure 8: Related Industries with Highest Economic Importance in the Provinces and Territories



#### 4. Conclusion

In order to determine which industries and sectors have the highest potential to benefit from circularization and hence should be prioritized for policy intervention, the final step of the analysis involved looking at both the economic importance of products and the economic importance of industries concurrently. See Figure 9. When doing so, the industries with the highest potential emerged to be construction; food manufacturing; and primary metal manufacturing and fabricated metal manufacturing (taken together).

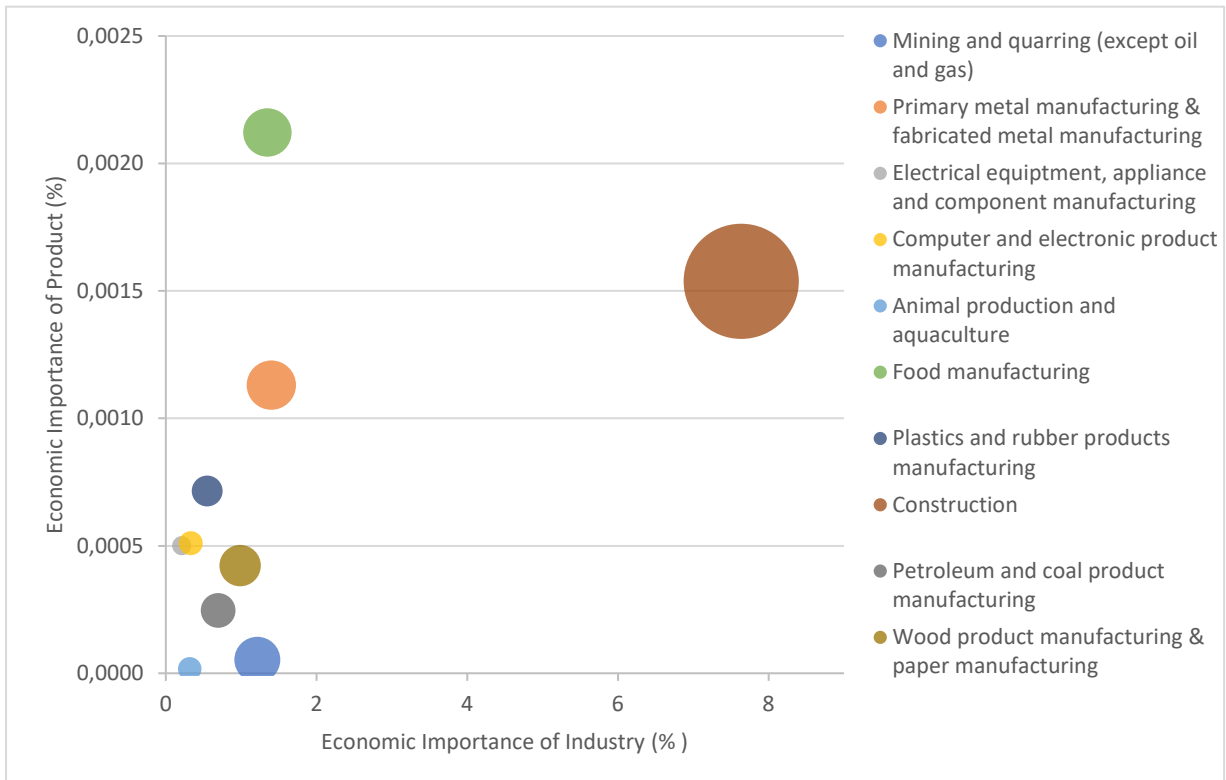


Figure 9: Prioritization of Industries in Canada

A similar exercise was done to determine the industries with the highest potential in the Provinces and Territories. The results of that analysis are depicted in figure 10. Note- the industries highlighted in the figure are not ranked and are presented in no particular order. Similar to the national level, construction and food manufacturing emerged as the industries with the highest potential to benefit from circularization.

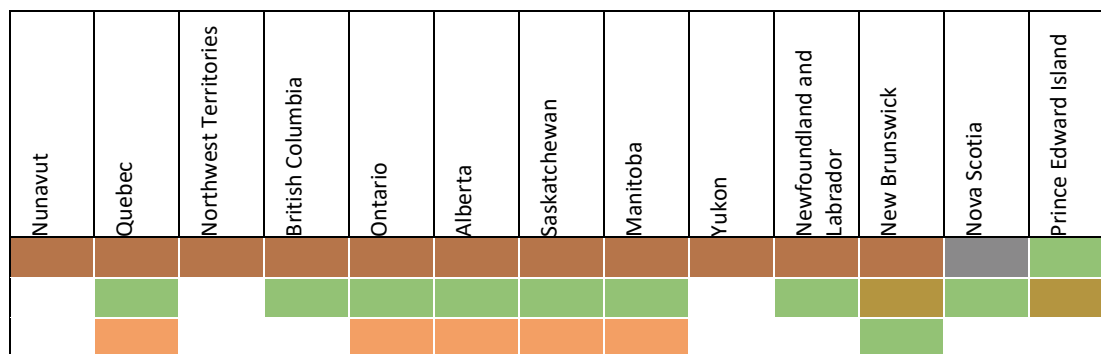


Figure 10: Prioritization of Industries in the Provinces and Territories



While this report hopes to act as a steppingstone for further deliberations with key stakeholders and sectoral experts, it does not claim to offer definitive recommendations on which sectors and industries should be prioritized for a circular economy policy in Canada, as other methodologies might lead to different conclusions. A more in-depth evaluation which takes into account a full range of products that can potentially become a part of the circular economy, more circularization processes and the industries capable of undertaking these processes is required to determine which sectors and industries have the highest potential to reap the benefits of a circular economy at both the federal and provincial level.

Appendix 1: Economic importance of products at the core of initiatives, Value of the quantities acquired by local industries, households and the public sector, M\$, 2016

<i>Product</i>	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon	Northwest Territories	Nunavut
Palladium	557	0	0	0	0	381	176	0	0	0	1	0	0	0
Copper	1,358	2	0	0	0	1,312	0	0	0	0	45	0	0	0
Steel and steel and semi-steel products	40,836	536	56	386	267	9,298	20,472	1,187	1,120	5,263	2,181	8	31	31
Batteries in electrical products	1,751	25	5	45	31	349	789	46	47	203	202	1	5	1
Medical equipment: MRI, CT and X-ray	2,104	108	6	38	28	237	632	68	115	622	238	3	4	6
Manure	630	2	3	7	5	109	129	81	103	159	32	0	0	0
Food	76,636	1,030	282	1,775	1,612	17,575	30,952	2,410	2,000	8,606	10,219	62	98	14
Plastic products	25,830	100	33	347	298	5,179	15,209	629	356	1,853	1,793	8	14	11
Used building materials	55,543	760	96	852	611	7,269	12,344	1,464	1,451	5,964	24,084	115	277	255
Used oils	8,905	274	22	107	223	1,270	4,113	163	247	1,601	830	9	32	14
Residual packaging: Wood, paper and cardboard	15,257	85	77	257	427	4,155	6,906	481	281	1,198	1,369	6	9	6
Electrical and electronical waste	16,334	211	35	266	178	3,439	7,807	386	449	1,554	1,942	18	28	22
<b>Total</b>	<b>2,45,741</b>	<b>3,133</b>	<b>613</b>	<b>4,079</b>	<b>3,680</b>	<b>50,575</b>	<b>99,529</b>	<b>6,914</b>	<b>6,169</b>	<b>27,023</b>	<b>42,936</b>	<b>230</b>	<b>500</b>	<b>360</b>

Appendix 2: Economic importance of industries directly related to initiatives, GDP, M\$, 2016

<i>Industries</i>	<i>Product</i>	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon	Northwest Territories	Nunavut
Mining and quarrying (except oil and gas)	Palladium, Copper	22,904	1,561	4	81	208	4,069	6,312	682	4,141	896	3,672	241	602	434
Primary metal manufacturing	Steel and related products	11,131	38	1	2	33	4,147	4,818	531	174	220	1,169	0	0	0
Fabricated metal product manufacturing	Steel and related products	15,273	109	34	166	155	3,719	6,854	369	301	2,394	1,168	4	0	0
Electrical equipment, appliance and component manufacturing	Batteries, Electric and electronic components	3,980	4	15	15	4	1,264	1,888	112	70	286	324	0	0	0
Computer and electronic product manufacturing	Medical equipment, Electric and electronic components	6,242	11	4	89	23	1,654	3,277	73	101	373	636	1	0	0
Animal production & aquaculture	Manure	5,982	101	75	181	224	1,541	1,590	532	294	671	770	1	2	0
Food manufacturing	Food	25,422	468	304	544	791	6,262	9,779	1,148	721	3,285	2,113	1	0	7
Plastics and rubber products manufacturing	Plastic products, packaging components	10,347	12	0	515	89	2,741	5,396	303	35	689	562	4	1	0
Construction	Building material	1,44,019	4,086	319	2,206	1,970	24,338	49,821	4,653	6,529	30,290	18,867	219	468	252
Petroleum and coal product manufacturing	Oil	13,090	241	1	12	639	2,285	4,123	25	844	4,166	754	0	0	0
Wood product manufacturing	Packaging component	9,990	26	6	139	400	2,554	1,678	163	213	1,400	3,413	0	0	0
Paper manufacturing	Packaging component	8,607	58	28	120	496	3,191	2,565	122	50	582	1,396	0	0	0
<b>Total</b>		<b>2,76,89</b>	<b>6,715</b>	<b>791</b>	<b>4,070</b>	<b>5,031</b>	<b>57,762</b>	<b>98,100</b>	<b>8,712</b>	<b>13,472</b>	<b>45,253</b>	<b>34,845</b>	<b>471</b>	<b>1,073</b>	<b>693</b>

Appendix 3: Economic importance of industries directly related to initiatives into jurisdiction's economy, % of jurisdiction's GDP

<i>Industry</i>	<i>Product</i>	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon	Northwest Territories	Nunavut
Mining and quarrying (except oil and gas)	Palladium, Copper	100%	6.8%	0.0%	0.4%	0.9%	17.8%	27.6%	3.0%	18.1%	3.9%	16.0%	1.1%	2.6%	1.9%
Primary metal manufacturing	Steel and related products	100%	0.3%	0.0%	0.0%	0.3%	37.3%	43.3%	4.8%	1.6%	2.0%	10.5%	N/A	N/A	N/A
Fabricated metal product manufacturing	Steel and related products	100%	0.7%	0.2%	1.1%	1.0%	24.3%	44.9%	2.4%	2.0%	15.7%	7.7%	0.0%	N/A	N/A
Electrical equipment, appliance and component manufacturing	Batteries, Electric and electronic components	100%	0.1%	0.4%	0.4%	0.1%	31.8%	47.4%	2.8%	1.7%	7.2%	8.1%	N/A	N/A	N/A
Computer and electronic product manufacturing	Medical equipment, Electric and electronic components	100%	0.2%	0.1%	1.4%	0.4%	26.5%	52.5%	1.2%	1.6%	6.0%	10.2%	0.0%	N/A	N/A
Animal production and aquaculture	Manure	100%	1.7%	1.3%	3.0%	3.7%	25.8%	26.6%	8.9%	4.9%	11.2%	12.9%	0.0%	0.0%	N/A
Food manufacturing	Food	100%	1.8%	1.2%	2.1%	3.1%	24.6%	38.5%	4.5%	2.8%	12.9%	8.3%	0.0%	0.0%	0.0%
Plastics and rubber products manufacturing	Plastic products, packaging components	100%	0.1%	s/o	5.0%	0.9%	26.5%	52.2%	2.9%	0.3%	6.7%	5.4%	0.0%	0.0%	N/A
Construction	Building material	100%	2.8%	0.2%	1.5%	1.4%	16.9%	34.6%	3.2%	4.5%	21.0%	13.1%	0.2%	0.3%	0.2%
Petroleum and coal product manufacturing	Oil	100%	1.8%	0.0%	0.1%	4.9%	17.5%	31.5%	0.2%	6.4%	31.8%	5.8%	N/A	N/A	N/A
Wood product manufacturing	Packaging component	100%	0.3%	0.1%	1.4%	4.0%	25.6%	16.8%	1.6%	2.1%	14.0%	34.2%	0.0%	0.0%	N/A
Paper manufacturing	Packaging component	100%	0.7%	0.3%	1.4%	5.8%	37.1%	29.8%	1.4%	0.6%	6.8%	16.2%	N/A	N/A	N/A

Appendix 4: Distribution of industries directly related to initiatives across Canada, % of industry's GDP in Canada

<i>Industry</i>	<i>Product</i>	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon	Northwest Territories	Nunavut
Mining and quarrying (except oil and gas)	Palladium, Copper	100%	6.8%	0.0%	0.4%	0.9%	17.8%	27.6%	3.0%	18.1%	3.9%	16.0%	1.1%	2.6%	1.9%
Primary metal manufacturing	Steel and related products	100%	0.3%	0.0%	0.0%	0.3%	37.3%	43.3%	4.8%	1.6%	2.0%	10.5%	0.0%	0.0%	0.0%
Fabricated metal product manufacturing	Steel and related products	100%	0.7%	0.2%	1.1%	1.0%	24.3%	44.9%	2.4%	2.0%	15.7%	7.7%	0.0%	0.0%	0.0%
Electrical equipment, appliance and component manufacturing	Batteries, Electric and electronic components	100%	0.1%	0.4%	0.4%	0.1%	31.8%	47.4%	2.8%	1.7%	7.2%	8.1%	0.0%	0.0%	0.0%
Computer and electronic product manufacturing	Medical equipment, Electric and electronic components	100%	0.2%	0.1%	1.4%	0.4%	26.5%	52.5%	1.2%	1.6%	6.0%	10.2%	0.0%	0.0%	0.0%
Animal production and aquaculture	Manure	100%	1.7%	1.3%	3.0%	3.7%	25.8%	26.6%	8.9%	4.9%	11.2%	12.9%	0.0%	0.0%	0.0%
Food manufacturing	Food	100%	1.8%	1.2%	2.1%	3.1%	24.6%	38.5%	4.5%	2.8%	12.9%	8.3%	0.0%	0.0%	0.0%
Plastics and rubber products manufacturing	Plastic products, packaging components	100%	0.1%	0.0%	5.0%	0.9%	26.5%	52.2%	2.9%	0.3%	6.7%	5.4%	0.0%	0.0%	0.0%
Construction	Building material	100%	2.8%	0.2%	1.5%	1.4%	16.9%	34.6%	3.2%	4.5%	21.0%	13.1%	0.2%	0.3%	0.2%
Petroleum and coal product manufacturing	Oil	100%	1.8%	0.0%	0.1%	4.9%	17.5%	31.5%	0.2%	6.4%	31.8%	5.8%	0.0%	0.0%	0.0%
Wood product manufacturing	Packaging component	100%	0.3%	0.1%	1.4%	4.0%	25.6%	16.8%	1.6%	2.1%	14.0%	34.2%	0.0%	0.0%	0.0%
Paper manufacturing	Packaging component	100%	0.7%	0.3%	1.4%	5.8%	37.1%	29.8%	1.4%	0.6%	6.8%	16.2%	0.0%	0.0%	0.0%

