METRO VANCOUVER REUSE SECTOR ASSESSMENT

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This report was produced as part of the UBC Sustainability Scholars Program, a partnership between the University of British Columbia and various local governments and organizations in support of providing graduate students with opportunities to do applied research on projects that advance sustainability across the region.

This project was conducted under the mentorship of Metro Vancouver staff. The opinions and recommendations in this report and any errors are those of the author and do not necessarily reflect the views of Metro Vancouver or the University of British Columbia.

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EXECUTIVE SUMMARY

This report aims to assess the reuse industry in the Metro Vancouver region to understand how reuse can be quantified. This study explores reuse in three primary sectors: (1) Textile, (2) Electronics, and (3) Furniture. It explores how the impact of reuse has been quantified worldwide and its benefits and challenges. It also recognizes the key players in each industry and tries to understand and compile available data.

In recent years, the concept of reuse has grown and become popular globally. As reuse networks become successful in diverting wastes from landfills and reducing greenhouse gas (GHG) emissions, it has become increasingly important to quantify the impact of reuse. Quantification will help identify the scale and significance of the reuse industry. It will give insight into how this industry contributes to society, the economy, and the environment.

The textile reuse industry is very prominent in the Metro Vancouver region. Many of the large players were ready to share data voluntarily for the study. The electronic reuse industry includes popular programs such as the Apple Trade-In and the Microsoft Refurbished Program, amongst other non-profit organizations. However, it was only possible to gain data from one organization. The furniture reuse industry was the hardest to study, as many organizations did not only sell furniture but also provided other services. Furthermore, no data could be accumulated from this industry.

Drawing from potential models from other cities and examining the available data in the region, this report attempts to identify challenges and ways to quantify reuse in the Metro Vancouver region.

1.0 BACKGROUND

Metro Vancouver is responsible for waste reduction, recycling planning, and the operation of a series of solid waste facilities in the region. It publishes the "Recycling and Solid Waste Management Report" annually to summarize the region's recycling and solid waste management activities in the previous calendar year. In 2018, Metro Vancouver hired Kelleher Environmental, in association with Maura Walker & Associates, to estimate Reuse in Metro Vancouver. To further refine the region's reuse estimate, Metro Vancouver partnered with the UBC Sustainability Scholars program to research best practices for quantifying reuse globally, finding and documenting sources of regional reuse data, and designing an easily replicable methodology for estimating reuse in the region on an annual basis.

2.0 INTRODUCTION

The Fifth Annual Kijiji Second-Hand Economy Index Report (2019)[1] defines second-hand practices or reuse as "a relatively broad concept that involves extending the lifespan of products by providing them to other individuals for using again." The NYC Reuse Sector Report (2019)[2] also defines reuse as "the use of a product more than once (often multiple times) in its original form, for the same purpose or a different purpose. This can involve donations, second-hand purchases, exchanges, free sharing, paid sharing, rentals or lending.

The definition of reuse for this project focuses on materials used again in their original format without repurposing and changing their structure. Suppose the materials are turned into raw materials that will be used again for a completely new product. In that case, this is considered recycling instead of reuse in this report. Therefore, reuse ranks higher on the waste hierarchy above recycling (figure 1). It diverts waste from disposal and recycling, increasing the materials lifecycle. This way, reuse has more advantages as it saves energy that comes with dismantling and re-manufacturing products. Furthermore, the dependence on raw materials decreases. The second-hand market offers the additional benefit of providing quality products at a reasonable price.

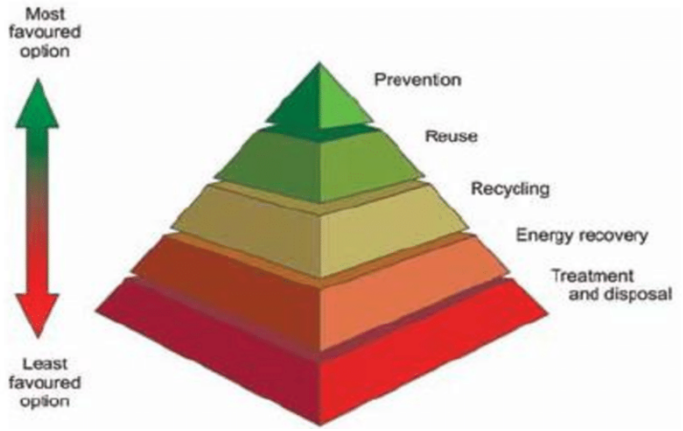

Figure 1. Waste hierarchy, source:(Zeqiri et al., 2019)

Metro Vancouver compiles and publishes *the Recycling and Solid Waste Management Annual Summary* that calculates the amount of solid waste disposed and recycled in the region. The report also includes a separate section which estimates waste diverted through reuse activities. Measuring the impact of reuse is very challenging, as it is a broad concept that encompasses various materials and mechanisms. This report can help Metro Vancouver get a different perspective on the reuse industry as it updates its Solid Waste Management Plan and explores metrics for measuring progress towards its waste reduction and recycling goals.

[1] https://www.kijiji.ca/kijijicentral/app/uploads/2019/10/Kijiji-Index-Report-2019_EN_final_pages-2_compressed.pdf

[2] https://dsnydonate.cityofnewyork.us/wp-content/uploads/2018/09/2019-NYC-Reuse-Sector-Report-FINAL.pdf

3.0 RESEARCH QUESTIONS

The main questions this project proposes to answer are as follows:

1. What are some good practices of estimating reuse globally?
2. Who are the key players in Metro Vancouver?
3. What kind of data is available from each of these players?
4. How can Metro Vancouver quantify reused?

4.0 APPROACH

Information presented in this report was compiled from:

- Internet-based research
- Reviews of websites and news articles
- Annual Reports published by companies and organizations
- Email and telephone contact with staff from different organizations involved in the reuse sector

5.0 BEST PRACTICES

Reuse as a concept has become increasingly popular across the world. Previously, financial motivation was the main driver of reuse. However, environmental awareness has compelled many cities to change their attitudes and regulations to adopt and better understand the reuse industry.

Unlike quantifying the recycling industry, which is reasonably much easier, quantifying reuse is still a new concept due to the broadness of the idea, lack of data, and difference in definitions. A proper way to estimate the diversion through reuse is still not been fully developed.

For the initial part of the project, a broad literature review was conducted to scan how this issue is being tackled globally. From the research, a lot of reuse networks around the world were recognized. The London Reuse Network, the New York Reuse Network, and the European Reuse network (RReuse) have successfully raised public awareness of reuse, facilitated reuse, and diverted waste from landfills. However, most of these networks have not yet focused on quantifying reuse. Out of these very well-known networks, only the New York Reuse Network had approached estimating the impact of reuse; therefore, this study only goes in-depth to understand The New York City Reuse Impact.

5.1 THE CITY OF NEW YORK

5.1.1 Overview

The Reuse Network[3] in New York comprises different, interrelated projects designed to promote reuse, focusing on communication, education, and research. The New York City Center of Material Reuse (NYC CMR) promotes the understanding of the reuse sector by researching, connecting, supporting, and promoting New York's reuse organizations. There are four leading roles of the project:

1. Research and Data analysis
2. Education and Promotion
3. Development and Networking
4. Providing user interface and infrastructure

Figure 2. NYC Sanitation logo, source: (DonateNYC, 2021)

For this project, only the research and data analysis aspect of the Reuse Network is explored. The Research and Data analysis for New York is

[3] https://www.nycmedp.org/who_we_are/index.html

conducted by The New York City Center of Material Reuse (NYC CMR). The NYC CMR collects information and data on the success of reuse programs and intends to expand the reuse sector's capacity.

Under the NYC CMR is the NYC Reuse Sector Data Management Project (DMP). The DMP project is specifically responsible for collecting data on the Reuse sector to better understand the city's environmental, social, and economic impact. The DMP program is controlled by the Bureau of Waste Prevention, in collaboration with the City College of New York.

For research and data analysis purposes, NYC CMR applies the methodology developed by Fortuna and Diyamandolu (2016). This approach assesses the material composition of products by utilizing a database to break products down into its material composition. NYC CMR automated this process of matching the products to the material for swift calculations. This method reclassifies products to minimize diversity in the product description and standardize the materials, which solves the lack of data (Fortuna and Castaldi, 2018).

The data used by NYC CMR to estimate the environmental impacts for the reuse activities have been collected from organizations in the DonateNYC Partnership.

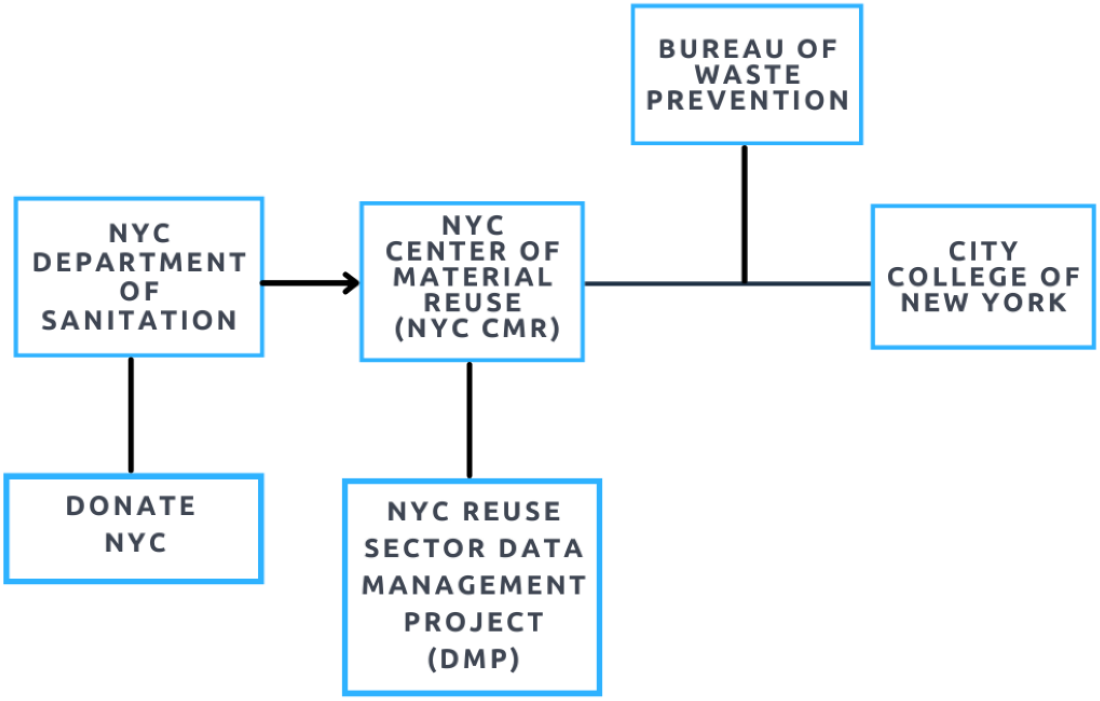

Figure 3. New York Reuse Network

DonateNYC[4] aims to quantify the impacts of reuse activity in New York City. In order to do so, DonateNYC collects and analyzes all Partner data. The partner organizations share this data as this research results in annual individualized environmental impact reports and statistics that can be used for promotion (fig. 3). Some of the organizations that are members are as follows:

- Bottomless Closet
- Bike New York
- Brooklyn Book Bodega
- Habitat for Humanity ReStore
- The Salvation Army

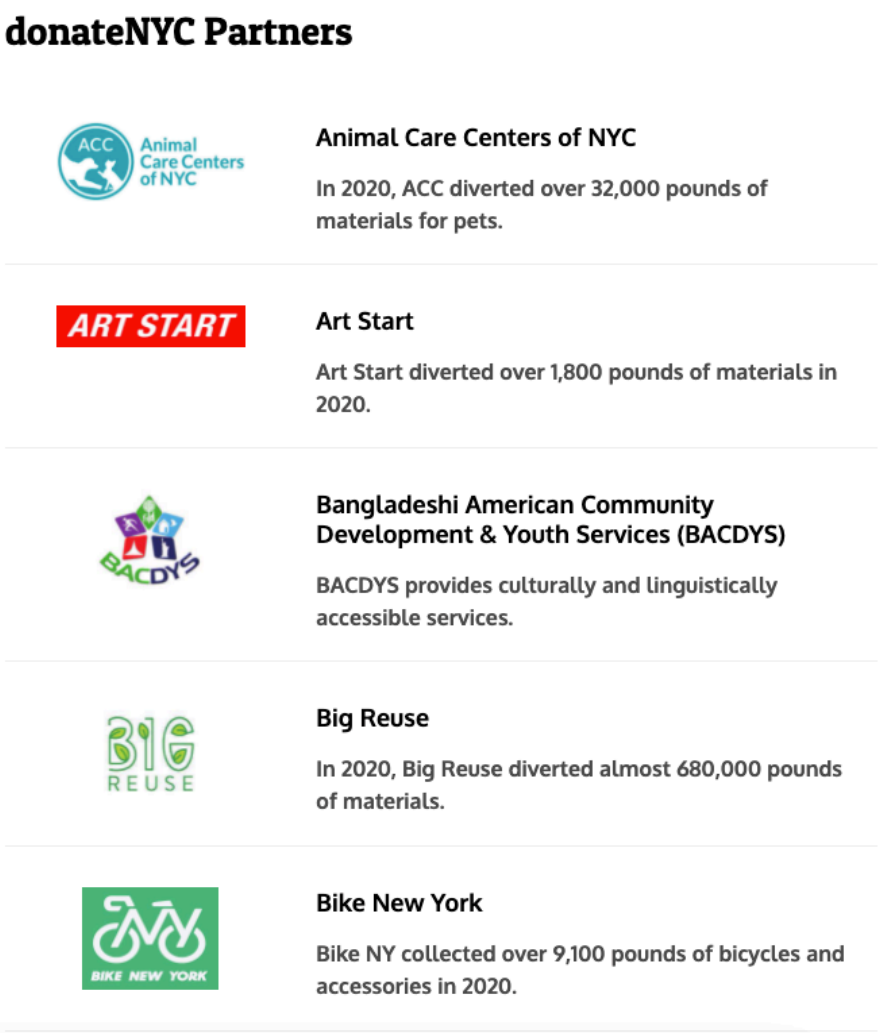

Figure 4. DonateNYC Partners, Source: (DonateNYC, 2021)

[4] https://www.nycxreuse.com/about-donatenyc

5.1.2 The Reuse Impact Calculator (RIC)

The Reuse Impact Calculator (RIC) is a web application with a user-friendly interface to standardize and automate data collection and calculation. It provides a single data repository that combines data reports and extracts only the required information for computation. The main steps of the automated process of the RIC are as follows (Fortuna and Castaldi, 2018):

1. The Data Management Project analyzes each organization's activity data and extracts information on the products such as (Name, Type, Quantity, Attributes, Weight, Volume)
2. It classifies reused products according to a universal product classification system to standardize the materials.
    a. If such information is not available, field characterization studies (FCS) are performed to develop it
3. It calculates the total weight of the materials diverted by organizations
4. It estimates the material composition of diverted products
5. It estimates the CO_2 emissions and energy savings from the diversion of materials.

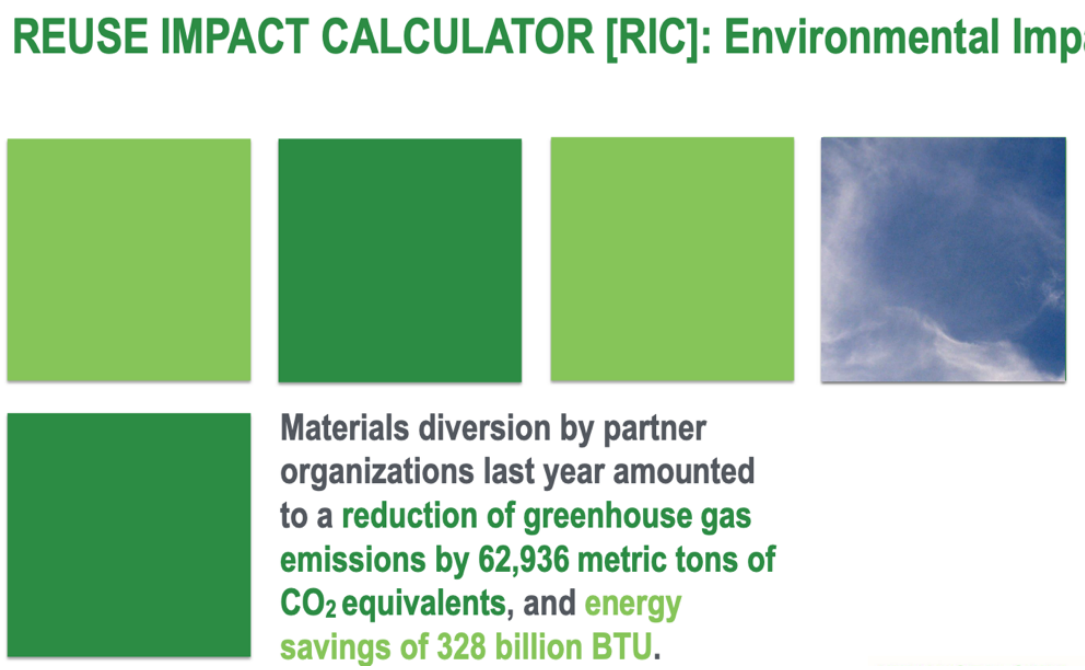

Figure 5. RIC Impact Calculator output (Source: Fortuna, 2016)

5.1.3 Impact indicators

The Reuse Impact Calculator (RIC) uses two main indicators to quantify environmental impact, (1) Greenhouse gas emissions and (2) Energy Savings. The system uses emission factors to perform environmental impact calculations. The emission factors are integrated into the RIC, which allows the user to estimate tonnes of CO_2 equivalent and draw conclusions regarding greenhouse gas emission. Similarly, this is also used to calculate the energy use in BTUs.

The RIC also uses conversion factors to illustrate greenhouse gas emission in terms of equivalent acres of US forests and the number of passenger vehicles. In the future, acid rain and smog potential can also be used as indicators. However, NYC believes that the GHG emission and energy use represent the impacts of the reuse industry well (Fortuna and Castaldi, 2018). However, the other indicators can be used for awareness purposes.

5.1.4 Benefits of the Reuse Impact Calculator (RIC)

The Reuse Impact Calculator (RIC) is dynamic and easily adjustable to include any product or material. New lists of products can easily be added or removed when required. As the RIC reclassifies each of the products into standard categories, it converts diverse datasets to data that is comparable. It does this by converting all materials to weight in pounds or tonnes. Furthermore, the use of material composition allows the calculator to incorporate actual weights of reused materials. The RIC can also process large datasets, which makes it easy to use. Lastly, the ability of auto-reclassification of inputted datasets through an automated process makes this calculator very effective. It also generates reports that can be distributed to the participating organizations and the public, which helps with educational purposes.

5.1.5 Challenges of the Reuse Impact Calculator (RIC)

Diversity of the products still serves as a challenge, as this leads the model to make assumptions of the material composition, affecting the accuracy of the estimated environmental impacts (Fortuna, 2016). Receiving data from a reuse organization is another significant challenge. It is important to note that organizations may not be willing to share their data and that not all organizations record the same data. It is essential to note the RIC only calculates data from its partner organizations. Therefore, the number does not indicate the reuse estimate for the whole city.

5.1.6 What can Metro Vancouver learn from this example?

The example of New York City highlights the importance of establishing partnerships with all the key players in the reuse industry. This will be very beneficial for collecting required data from the organizations. There were no incentives provided to the organizations. Participation appears entirely voluntary. Therefore, the reuse estimate is only based on the information provided by the partner organizations. However, the NYC Center of Material Reuse (CMR) is satisfied with the assessment. The development of appropriate incentives may help boost participation and the collection of data from a wider range of sources. A similar approach to New York can also be adopted, where calculation is performed on the basis of the data provided willingly by organizations. However, it is important to note that this estimate may not be fully representative of the entire reuse industry of the region. Previously, the NYC CMR employees were able to calculate the greenhouse gas emissions and energy savings manually before the Reuse Impact Calculator (RIC) was developed. Therefore, it is possible for Metro Vancouver to proceed quantifying the reuse industry without a web designed calculator. Nevertheless, it has been evident that the development of the automated RIC proves to be more effective and that it plays a crucial role in facilitating the calculation of reuse.

5.2 RREUSE

RREUSE[5] is an international non-profit network representing social enterprises active in the field of reuse and repair and recycling sector. It was previously mentioned that the RReuse does not have a proper way of estimating reuse impact. However, they have developed a user-friendly calculator[6] for educational purposes. The calculator seems to be working on a similar principle followed by the Reuse Impact Calculator (RIC). It also calculates the CO_2 emissions, the number of trees, and GHG emissions from cars that can be avoided by reusing different objects. The objects are of very vague categories. This calculator definitely cannot be used to make reliable estimates. However, it can be used for educational purposes or as an example to understand the RIC better.

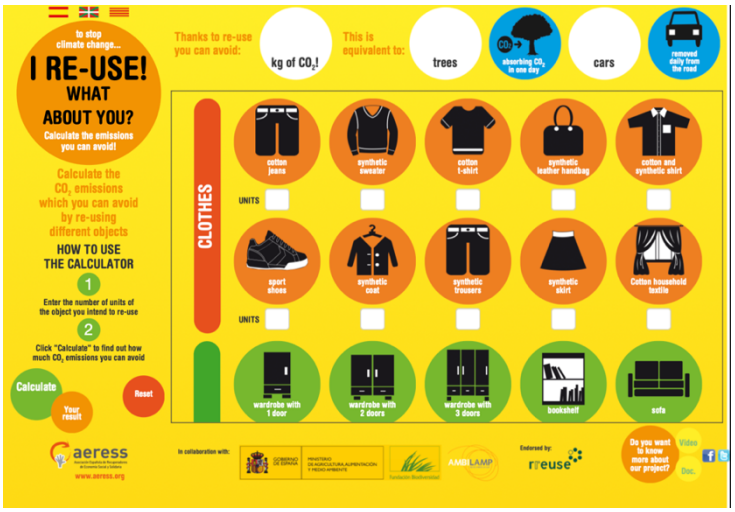

Figure 6. RREUSE impact calculator (Source: rreuse.org)

[5] https://www.rreuse.org
[6] http://reutilizayevitaco2.aeress.org/en/

5.3 REUSE NETWORK – UK

Reuse Network[7] is UK's membership body that is dedicated to charitable and voluntary reuse organizations. Along with tackling waste issues, the network is committed to reduce poverty and provide support to marginalized communities. The organization publishes a *social impact report*[8] where it discloses quantified data regarding the reuse sector. However, the network does not tell how this is calculated. Nevertheless, on their website, there is a similar Impact calculator like the one from RREUSE. Similarly, this is not a reliable calculator and can only be used for educational purposes.

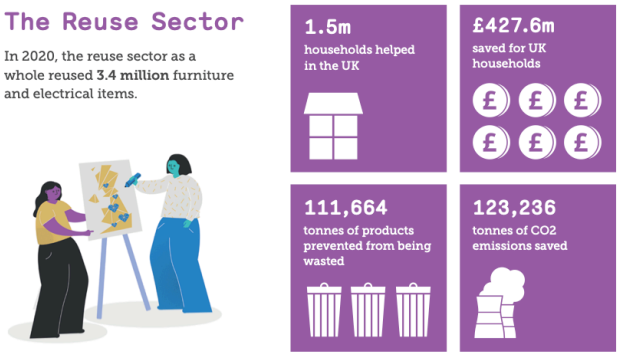

Figure 7. Reuse data from social impact report (source: social impact report, reuse-uk, 2021)

5.4 QUANTIFYING REUSE IN CANADA BY KIJIJI

5.4.1 Overview

In 2014, Kijiji began quantifying the second-hand economy (reuse) in Canada. The research is led by Fabien Durif and his team at the Université du Québec à Montréal's School of Management (Kijiji Second-Hand Economy Index, 2019). Every year, this research is published as "The Annual Kijiji Second-Hand Economy Index"[9]. According to this report, a survey is first conducted online to gather information regarding Canadians' behaviors and habits related to second-hand practices. The team then quantifies the actual intensity of such practices across 22 product categories. Then economic calculations are performed to find the required information.

Figure 8. Data of reuse of different categories from Kijiji (source: Kijiji index report, 2019)

[7] https://reuse-network.org.uk
[8] https://reuse-network.org.uk/wp-content/uploads/2021/05/Social-Impact-Report-2020.pdf

[9] https://www.kijiji.ca/kijijicentral/app/uploads/2019/10/Kijiji-Index-Report-2019_EN_final_pages-2_compressed.pdf

5.4.2 Conclusion

This is a comprehensive report that quantifies reuse activities in different provinces and major cities around Canada. Kijiji works with a research team to produce this report. Metro Vancouver could explore a similar approach to quantify reuse in the Metro Vancouver area. Furthermore, the approach taken by Kijiji can be studied to see if it can be utilized in the context of the region. The report covers everything from reuse activity habits of different age groups to the effect of reuse on Canada's economy. Overall, this is an excellent report for inspiration.

6.0 REUSE IN METRO VANCOUVER

Examples of reuse markets in the Metro Vancouver area include thrift stores, online marketplaces, construction material salvage and used furniture resale, and food recovery networks. This project explored three of the major industries in Metro Vancouver, namely (1) Textile, (2) Electronics, (3) Furniture.

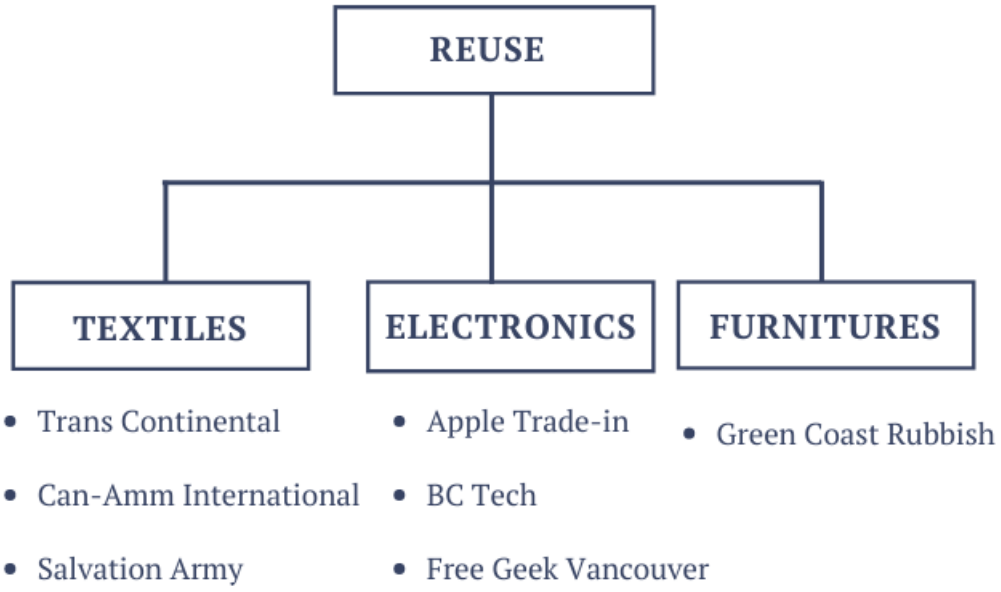

Figure 9. Key players for each of the reuse industry

Firstly, the leading organizations and key players for each of these sub-industries were recognized. Then the website for each of these organizations was thoroughly investigated to see if any reports were published that had any important data. If these reports were unavailable, the organizations were contacted through email or by phone. This helped us understand the quality of data collected by these companies and if they would be willing to share such information with Metro Vancouver annually to help with the annual report.

6.1 TEXTILE INDUSTRY

6.1.1 Overview

According to the Fifth Annual Kijiji Second-Hand Economic Index Report (2019), most second-hand transactions involved clothing, shoes, and accessories. The regional businesses and organizations engaged in second-hand textile products include thrift shops, charity collectors, and sorter/grader organizations. Metro Vancouver has developed a good relationship with the key players in the textiles reuse industry. Therefore, most organizations were willing to share their data voluntarily.

Figure 10. Clothes at salvation army (source: salvation army, 2013)

Some organizations that have had a prominent impact in this sector in the region include:

- TransContinental Textile Recycling
- Cann-Amm Exports
- Dominion Textiles
- Delta Textiles
- Pacific Clothing Recyclers
- Bank and Vogue
- Salvation Army

All these organizations were contacted to see if they would be willing to share their data for 2020. We asked the sorter-grader organization the following information:

- 2020 annual tonnes of textiles collected
- 2020 annual tonnes sold as shoddy
- 2020 annual tonnes sold as mungo
- 2020 annual tonnes disposed

For charity collectors, we asked for the following information:

- 2020 annual tonnes of clothes/accessories collected
- 2020 annual tonnes of furniture collected
- 2020 annual tonnes of sold/donated for reuse
- 2020 annual tonnes sent to sorter-graders
- 2020 annual tonnes disposed

We attained data for only two sorter-grader organizations: (1) Trans-Continental Textile Recycling, (2) Can-Amm Exports, and from Salvation Army.

Table 1. Key players in the textile reuse industry with data from their websites

Organization	**Organization Type**	**Notes from the website**
Trans-Continental Textile Recycling	Sorter-Grader	"TCR recycles up to **60,000 lbs.** of textiles daily." "Approximately **8,000 pounds** a day of unwearable cotton and cotton blend clothing is sorted and cut in our facility into wiping rags for the industry."
Cann-Amm Export	Sorter-Grader	"Currently exporting about **600 containers** annually to various destinations across Africa, South East Asia and North America."
Dominion Textiles	Sorter-Grader	No website
Delta Textiles	Sorter-Grader	No functioning website
Pacific Clothing Recyclers	Sorter-Grader	No information
Bank and Vogue	Sorter-Grader	"Last year, we moved over **90 million pounds** of used goods around the world, saving them from the landfill and finding new homes for these products."
Salvation Army	Charity Collector	"Diverted. **86,298,351 lbs.** from local landfills, including: • 33,566,975 lbs. of clothing and textiles • 32,359,881 lbs. of household items • 12,005,141 lbs. of electronic and metal • 7,366,355 lbs. of books, paper and pulp."

6.1.2 Key Players

1. Trans-Continental Textile Recycling

Trans-Continental Textile Recycling (TCTR)[10] is a local BC company that has been processing recycled textiles since 1990. The organization processes and distributes textiles collected in all forms, from usable personal clothing to industrial wiping rags and textile wastes. The organization communicated that the company's operations were affected by the challenges in 2020, and therefore, fewer textiles were collected. The shoddy, mungo, and garbage percentage is relatively higher as "much could not be exported due to closures in the international market." The company stated that these numbers are not a good reflection of normal conditions.

2. Can-Amm Exports

Can-Amm International[11] is a textile recycling company with branches in North America, Africa, and India. It provides various specialized sorting and recycling services. Some of their services include:

- Wipers: From the received textiles, the company produces wipers for various industries from Automobiles to Pharmaceuticals.
- Used Clothing: They export about 600 million containers annually of used clothing to various destinations across Africa, South East Asia, and North America
- Vintage Clothing: Used clothes are sold to Korea, Japan, and North America.

3. Salvation Army

The Salvation Army Thrift Store National Recycling Operations (NRO)[12] is one of the largest charities in Canada and the largest national clothing recyclers. Through the thrift store, the Salvation Army sells used clothing, textiles and household items.

[10] http://www.transtextile.com/the_business.html

[11] http://www.cann-amm-exports.com/company.php

[12] https://salvationarmy.ca

6.1.3 Conclusion

Textiles are one of the most commonly reused items in Metro Vancouver. The organizations involved in the textiles reuse space are sorter/graders and charity collectors. Overall, the sorter/graders and charity collectors are very approachable and responsive. Conversations with a few organizations revealed that the organizations would be willing to provide voluntary data to help with Metro Vancouver's Solid Waste Annual Report.

Overall, data from two organizations were collected. Only one of the organizations was unwilling to share data. The Covid-19 pandemic caused many operational and logistical challenges and therefore, some organizations were unable to track or provide data for the calendar year 2020. However, they said they would be willing to share data another time under different circumstances. Three organizations (one charity collector and two sorter graders) shared data. The charity collector and one of the two sorter graders sent in data in the format that was requested. One charity collector sent data in a format the researcher could not understand. Therefore, the data was unusable for the project. Lastly, two of the organizations could not be reached through email or phone.

6.1.4 A methodology that can be followed:

1. As Metro Vancouver already has an excellent relationship with many textile reuse organizations, a partnership network similar to New York can be created. This way, there is a clear list of organizations that will voluntarily share the data annually.
2. A survey can be designed for distribution among the sorter-grader organizations to avoid problems with the diversity of materials and composition. This way, the information Metro Vancouver receives will already be standardized.
3. A similar survey can be created for charity collectors.
4. Similar to the New York Reuse network, the environmental assessment performed by this data may be shared with the organizations and may be used for educational and awareness approaches.

6.2 ELECTRONICS

6.2.1 Overview

For this project, the electronics category comprises items such as TVs, PCs, DVD players, cameras, laptops, stereo systems, telephones, and other computer equipment. A few programs and non-profit organizations in the Metro Vancouver region are active in electronics reuse. There are popular programs that have been running in the region, such as the Apple Trade in and the Microsoft Trade-in programs.

6.2.2 Key Players

1. Apple Trade-In

According to the Apple website[13], "if the device is in good working condition, it is refurbished and resold, diverting electronic waste from landfills." Apple also claims to reuse parts of the devices. Some of the programs that collect devices for refurbishing include:

- Apple trade-in
- iPhone Upgrade Program
- AppleCare
- Corporate Hardware Reuse Program

Figure 9. Apple trade-in (source: apple.com/ca/trade-in/

Apple's annual environmental report for 2020[14] states that 10.4 million devices were refurbished for new users.

Emails were sent to the recycling team of Apple, but there was no response. Also, the data published in Apple's environmental impact report is a global figure and not specific to a particular geographical region of interest.

[13] https://www.apple.com/ca/trade-in/
[14] https://www.apple.com/ca/environment/pdf/Apple_Environmental_Progress_Report_2021.pdf

2. Microsoft Trade-in

Similar to Apple, Microsoft has its own trade-in program called the "Refurbished PC program"[15]. Their website states that the program's objective is to "offer an opportunity to own pre-owned devices that are held to same standards as a brand-new product at a discounted price".

Emails were sent to The Environmental Compliance and Sustainability Team and the Microsoft Electronics Recycling program. Unfortunately, no data was acquired.

Figure 10. Microsoft refurbished program (source: microsoft.com)

3. BC Technology for Learning Society

BC Technology for Learning Society[16] is a non-profit organization. Their mission is to "provide job training for youth and access to refurbished technology for British Columbians". According to their website, in 2020, 14,000 computers were donated and 6069 computers were distributed. This was the highest number of computers donated since 2018. The client base for BC Technology consists of schools, low-income students, charities, libraries and Indigenous groups. Data for refurbished donated computers and related technology totals distributed to Metro Vancouver based clients for the fiscal year, April 01, 2020 – March 31, 2021, were acquired.

Figure 11. Reused computer advertisement from BC tech, (source: reusetechbc.ca)

From the conversation with the director of Donor Relations, BC Technology expressed willingness to provide data to Metro Vancouver regarding the distribution of refurbished computers to help quantify electronics reuse in the region.

[15] https://www.microsoft.com/en-us/store/b/microsoft-trade-in
[16] https://www.reusetechbc.ca

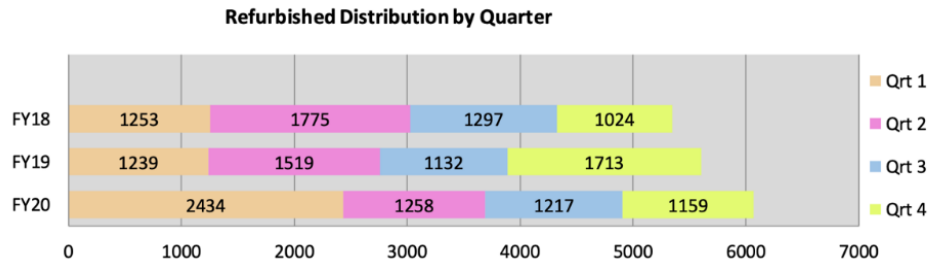

Figure 12. Refurbished Electronics Distribution for BC Tech (Source: reusetechbc.ca)

5. Free Geek Vancouver

Free Geek Vancouver[17] is another non-profit community organization that reuses and recycles donated electronics. The Free Geek Thrift Store sells refurbished computers (desktops, laptops and netbooks), computer hardware, smartphones, and video game consoles. They only sell what is donated to them. Though the organization does not have an annual report, the website states that the organization has rebuilt 47,023 computers and diverted 3,154 tonnes of e-waste from landfills.

Free Geek Vancouver does not have a phone number, and they did not reply to emails.

Figure 13. Free geek laptop sale advertisement (Source: freegeekvancouver.org)

6.2.3 Conclusion:

Data was only received from one organization. It was complicated to get in contact with the other three organizations. However, with the increasing popularity of the Apple and Microsoft Trade-In programs, it may be crucial to learn how many devices have been traded and how many refurbished devices were bought from the Apple Store and the Microsoft Store in the Metro Vancouver Region.

[17] http://www.freegeekvancouver.org

6.3 FURNITURE

6.3.1 Overview

This category includes items such as sofas, tables, chairs, and mattresses. As e-commerce keeps blooming, Facebook Marketplace has become a popular place for selling second-hand furniture in recent years. However, it is challenging to acquire data from Facebook marketplace because transaction details are not shared beyond the seller and the buyer.

6.3.2 Key Players

The organizations that resell furniture in Metro Vancouver are as follows:

- Urban Repurpose
- Habitat for Humanity ReStore
- Lookout Society
- HomeStart Foundation

Metro Vancouver already has data from Habitat for Humanity. It is challenging to obtain furniture data from the other organizations because their work encompasses many other areas such as providing free health care and shelter. Their annual report does not highlight any data regarding furniture either.

1. Green Coast Rubbish

Green Coast Rubbish[18] is a locally owned and operated junk removal company committed to sustainable waste diversion practices. They donate and recycle as much of the collected goods as possible. The posted statistics for 2019, states the diversion rate was 77%. The information below was gathered from their website.

Table 2. Diversion statistics for green coast rubbish (Source: greencoastrubbish.org)

Material	**Diversion Percentage[19]**	**Diversion amount**
Building materials (metal, concrete, tile etc.)	28%	197.13 t
Furniture, mattresses, carpet, couches	18%	131.37 t
Furniture, mattresses, carpet, couches	17%	122.82 t
Biomass (wood, plywood)	14%	102.66

[18] http://greencoastrubbish.com
[19] https://www.greencoastrubbish.com/about-us/green-junk-removal/

2. Salvation Army

Salvation Army sells clothing and used furniture. However, we were unable to acquire any data regarding furniture because they do not keep a record of such data.

6.3.4 Conclusion

Contacting and gathering information about the furniture reuse industry was the most challenging of all the sectors. Currently, stores that resell furniture do not record any data. Another challenge is the varying definitions of what constitutes furniture between organizations. As online platforms such as Facebook marketplace and Kijiji become popular places to sell furniture, it may become imperative to understand how data can be collected from these online sources.

For this study, Kijiji was contacted to see if they would be willing to share any data for 2020. Kijiji was asked if they could provide the following information:

- 2020 annual tonnes/ total number of items "Granted a second life in the Greater Vancouver area."
- The total value of all second-hand transactions for 2020
- Percentage/ number of items/ tonnes of acquisition and disposal for
    - Textiles/Clothing
    - Furniture
    - Electronics

However, Kijiji replied, they are not able to accurately measure these statistics independently. Furthermore, with fewer people transacting throughout 2020 due to the Covid-19 pandemic, Kijiji decided not to publish their Second-Hand Economic Index Report either due to "the anomalous data patterns."[20]

[20] Email exchange with Kent Sikstrom from Kijiji

7.0 CONCLUSION

The Reuse Impact Calculator (RIC) used by the city of New York is ideal for quantifying the reuse industry. Greenhouse gas emissions and energy-saving are excellent indicators as well. However, it is essential to note that the most crucial part of quantifying reuse is data availability. New York bases its calculation on the data provided to them from their partner organizations. It is unclear if there is a specific format for data submission. New York also holds conferences and workshops to help participating organizations and the public understand its approach. A similar approach can be explored in Metro Vancouver to establish a network and partnership with the key players and organizations for each primary reuse industry. This could facilitate the annual compilation of reuse data. Regarding the RIC, it would be very beneficial to have an automated interface to perform these calculations. Nonetheless, these calculations can also be completed manually, as it was previously done before the development of the RIC.

Kijiji has successfully quantified reuse and publishes its Second-hand Economic Index Report annually. They partner with a specialized research team responsible for surveying respondents and collecting data such as the economic value of second-hand merchandise. There may be benefit in further understanding the approach Kijiji applies to quantify reuse to see whether it can be used in Metro Vancouver.

Accumulating data was highly challenging, as dome organizations were unreachable, and others did not record data themselves. However, it is also important to note that this study was conducted during the ongoing Covid-19 pandemic, which acted as a barrier in data collection. Also, due to the pandemic, the data received does not reflect the normal level of reuse activity for each organization.

The challenges in quantifying reuse are as follows:

- Lack of data from organizations
- Diversity in data recorded by different organizations
- Lack of data from online platforms
- No existing interface to perform calculations
- No separate research team/network just for data analysis

To conclude, though the quantification of reuse is a relatively new topic, Mero Vancouver can consider the case studies presented in this report. Even before focusing on the actual calculations, it may be of more significance to commence partnerships with organizations to ensure the availability of standard data to quantify the reuse industry. Furthermore, with increasing popularity of e-commerce and online platforms, focus should also be shifted on incorporating such sites in the partnerships to be able to easily access data from them.

8.0 REFERENCES

"DonateNYC." 2021. Nyc.gov. 2021. https://www1.nyc.gov/assets/donate/site/.

"What You Should Know about Salvation Army Thrift Stores – the Salvation Army in Canada." 2013. The Salvation Army in Canada. August 12, 2013. https://salvationarmy.ca/blog/what-you-should-know-about-salvation-army-thrift-stores/.

Fortuna, L. M., & Castaldi, M. J. (2018). New York City's Reuse Impact Calculator: Quantifying the zero waste impact of materials reuse. Waste Management & Research, 36(12), 1190–1200. https://doi.org/10.1177/0734242X18802623

Fortuna, L.M. (2016). Quantifying Reuse in New York City: The Reuse Impact Calculator. https://www.nysar3.org/vs-uploads/conference_2016/1479650426_FortunaL.pdf

Fortuna, LM, Diyamandoglu, V (2016) A novel method for material characterization of reusable products. Waste Management 52: 14–24.

Zeqiri, Kemajl & Musa, Sc & Konjuhi, Avdi & Kutllovci, Festim. (2019). Foster of Mining Waste Recycling and 3R Principles in Mining Industry.