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November 22, 2021

City of Victoria
1 Centennial Square
Victoria, BC
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Sent Via Email

Re: **Single-Use Item Consultation Paper Response**

To Whom It May Concern:

On behalf of Restaurants Canada, I am writing today to provide feedback on the City of Victoria's Single-Use Item consultation paper.

Restaurants Canada has been the voice of foodservice in this country for 75 years. With over 30,000 members, Restaurants Canada's primary goal is to improve the foodservice industry for the millions of Canadians that rely on our industry for good food, entertainment, socialization and above all employment for 1.2 million Canadians.

Restaurants Canada recognizes sustainability is simply a part of doing good business in restaurants today. In fact, nine out of 10 respondents to our Restaurant Outlook Surveys consistently say they plan to continue or increase their current level of environmentally sustainable operations. Restaurants Canada supported our members' single-use items reduction efforts through our Single-Use Items Reduction Strategy Guide https://info.restaurantscanada.org/hubfs/Resources/Toolkits/Single-Use-Items-ReductionStrategy-Guide.pdf.

Restaurants across the country are working hard to navigate the complex and often contradictory patchwork of municipal bylaws and regulations around single-use items while balancing the needs of diners seeking increasing convenience while working towards improving environmental outcomes.

It is important for governments to understand the essential role packaging plays in being able to meet customer demand, but also in protecting the health and safety and integrity of the food our industry serves. It is crucial that restaurateurs be able to maintain the flexibility needed to be able to continue to meet consumer demand, protect the food we serve, while reducing use of single-use items. This is particularly true in the current operating environment.

Even before COVID-19 consumers were already increasingly demanding take-out & delivery food through the growing home delivery market. Since pandemic restrictions were implemented that significantly reduced on-premise dining, takeout and delivery sales became a much more important component of a restaurant's sales and 61% of members that did not previously offer take-out and delivery adopted take-out and delivery for a large portion of their sales. Over 90% of members who began to offer take-out and delivery since the pandemic will continue to do so permanently.

In fact, from April 2020 to April 2021 on-premise quick service restaurant sales declined significantly from 32% of sales to just 8.5% of sales. At the same time takeout sales increased from 34% to 40%, while drive-through sales increased from 26% to 38%, and delivery sales increased from 7% to 12% of sales.

The trend towards a greater reliance on take-out and delivery sales is even more pronounced in full service restaurants. In April 2020 on-premise sales represented 80% of sales. By April 2021 full service sales declined by almost half to 45% of sales. At the same time full service takeout sales tripled from 12% to 36% of sales. Delivery sales also more than doubled from 7% to 16% of sales. Therefore, as the City of Victoria contemplates further SUI restrictions the explosion of takeout t& delivery sales as large component of restaurant sales must be taken into account.

The significant negative impact on restaurants and hospitality businesses as a result of COVID-19 restrictions must also be taken into account as 80% of members continue to lose money every month since the pandemic began even with government supports. The industry has taken on additional debt pretty much every month since the beginning of the pandemic, and given the already low pre-COVID margins of less than 5% pre-tax profit, it will take most members more than a year after all COVID restrictions are finally removed to return to profitability. Restaurateurs cannot afford new costly regulations as they continue to try and survive.

Finally, as mentioned in previous correspondence with the City of Victoria on the bag bylaw any additional SUI regulations must be developed recognizing the difference between retail and foodservice operating environments as they relate to SUIs.

Restaurants Canada supports the City of Victoria's goal of reducing single-use and takeaway items and continues to encourage the city to work in lock-step with the province and the federal government to avoid the duplication of efforts, while creating a level playing field for businesses across the province and the country. Harmonization will lead to improved environmental outcomes, lower consumer costs, and reduce the operational impacts on business.

It is also important to recognize that restaurants operate in a highly regulated environment from liquor service, health standards, environmental responsibilities, labour regulation, fire, and a host of other municipal regulations. They also are facing labour cost increases, new employer health taxes, a severe labour shortage due to negative demographic trends, as well as rising food and insurance costs. It is within this context we would like to provide you with industry concerns on the SUI consultation paper's proposed policies.

By Request

Restaurants Canada has no specific concerns with requiring businesses to only provide SUIs by request. This is a reasonable SUI reduction measure but will require additional front line staff training before being implemented. It also must be accompanied by comprehensive industry and consumer education. Many members have already voluntarily implemented SUI only by request policies.

Mandatory Fees & Reusable Cups and Containers

Restaurants Canada supports user fees as a voluntary measure for businesses to consider as part of their individual single-use item reduction strategy rather than another fee for single-use items such as hot and cold drink cups.

With respect to reusable cups, a number of our members already incentivize customers to bring their own reusable hot beverage cups by offering discounts. However, in many cases health and safety concerns override the opportunity for the use of reusable alternatives, such as instances where the reusable cup is likely to come in contact with equipment as is often the case with products like iced beverages and milkshakes.

While Restaurants Canada members are currently considering participating in reusable cup share programs, there is not enough evidence from existing reusable cup share programs to indicate that these programs will have a significant impact on reducing the use of disposable cups. There are also operational health and safety concerns that need to be addressed in implementing reusable cup share programs.

With limited opportunities to bring in reusable cups, the cup fee may not be a deterrent to the use of the single-use items as it may encourage customers to select prepackaged bottled beverages in an effort to reduce their costs and avoid additional fees. Such a change would not result in a decreased use of single-use packaging as is the City's goal but does add unnecessary additional costs to price sensitive consumers and creates an un-level business playing field.

Implementing additional SUI fees may also place restaurant employees in a vulnerable position as they are the ones communicating additional fees to price sensitive customers — especially when the fees are kept by employers and have a significant impact on the final cost of a purchase. As an example, a $0.25 fee for a hot drink cup could represent as much as 20 per cent of the cost of the beverage purchased which could negatively impact sales. It is not a level business playing field as the fee would impact those businesses with lower priced menu items more. It also raises consumer costs and impacts affordability for low income customers. The cup fee also adds what amounts to an additional tax on single-use items paid by the consumer as businesses have already paid a fee to Recycle BC to cover the recycling costs of single-use items. Disposable cups are already recyclable and the fee does nothing to improve the recycling rate for these single-use items. It also puts Victoria businesses at a competitive disadvantage compared to similar businesses in other municipalities.

Furthermore, ensuring the fee is posted on the receipt, menus, and online ordering platforms adds additional red tape costs on businesses.

Bans

Restaurants Canada believes that any ban must only be implemented where accessible and affordable alternatives are available. Ban exemptions also need to be made where cost effective takeout & delivery packaging replacement products are not available.

Any potential SUI bans must also include comprehensive industry and consumer education to be successful and must recognize the unique and diverse operational realities of foodservice operations versus retail operations. In considering SUI bans foodservice establishments must be able to continue meeting the needs of their customers in a way that is accessible and safe, as well as sustainable.

Conclusion

Restaurant owners, operators and staff are working hard to navigate the complex regulatory environment related to the day-to-day operations of their businesses. Environmental actions in the foodservice industry involve the balancing of often conflicting pressures:

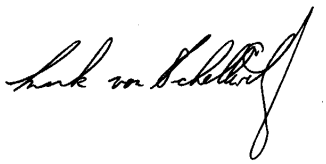
The pressure to reduce single-use items while protecting food safety and meeting the needs of guests seeking increasing convenience and delivery options. The desire to improve diversion of single-use items with the realities of available recycling programs. The requirement to meet different standards and expectations in different jurisdictions.

The desire for governments of all levels to act has created a patchwork of bylaws and regulatory frameworks that make it difficult for foodservice chains and independent operators to make decisions that benefit the environment. Foodservice establishments must be able to continue meeting the needs of their customers in a way that is accessible and safe, as well as sustainable. Businesses are willing to amend their practices and make investments to support a harmonized approach to single-use items, but they want to ensure these investments are effective. The government's commitment to work in concert with business will maximize everyone's efforts. Ultimately, it will be up to the public to buy into changes that will better our environment. Government's role in public education can be supported by business if we work together toward a common goal while maintaining the ability for businesses to service their guests who increasing demand more takeout & delivery options. To enable success, policy approaches should reflect the broadest scope possible. Restaurants Canada is supportive of frameworks that may be applied nationally that take an evidenced approach to reducing waste from single-use items.

We believe our members could have a greater impact on consumer behaviour by working with all levels of government on comprehensive consumer awareness and education campaigns on the general issue of single-use items to the millions of guests we serve across the country every day. Instead, foodservice industry businesses members are being forced to comply with a patchwork of sometimes impractical and contradictory single-use item municipal bylaws that put businesses in one municipality at a competitive disadvantage with competitors in another neighbouring jurisdiction.

Restaurants Canada appreciates the opportunity to provide feedback on the City of Victoria's SUI reduction consultation paper and looks forward to continuing to consult with the City of Victoria on any new proposed SUI restrictions.

Sincerely,



Mark von Schellwitz
Vice President, Western Canada

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Rhiannon Moore, MSc.
Outreach Coordinator (Zero Waste)
Engineering and Public Works | City of Victoria
1 Centennial Square
Victoria B.C. V8W 1P6

Dear Rhiannon Moore, MSc.,

We recently were made aware of a Consultation Paper and an engagement session coming up on the 16th of March surrounding the elimination of single-use items. Douglas Horne, our Founder and CEO spoke to you last week and we wanted to follow up with some information and resources for you.

Single-use plastics and EPS foam containers are most certainty polluting our environment and using up valuable natural resources. We wholeheartedly agree that initiatives must be implemented in the City of Victoria as well as every other city on the planet to reduce the plastic waste that ends up in our landfills and oceans. The recently published Consultation Paper by the City of Victoria makes many good points in regards to the benefits of using reusable containers but has drawn conclusions that are inaccurate and potentially harmful in regards to compostable materials.

The paper references having two primary goals: eliminating single-use items and packaging and making reusable products the default. On the outset these may seem like admirable goals, but there are considerations that simply haven't been made and this letter hopes to bring to light some information for the City and decision makers to consider before there is avoidable collateral damage to the community and the environment.

The Real Goal
Victoria's plan to become a zero-waste community, a community that supports sustainable choices and reduce waste disposal by 50% in 2040 has many initiatives within it. At the heart, the City wants "a community where nothing is wasted". The only way this is even reasonably achievable is to invest in composting, composting education and a composting infrastructure that accepts all materials that are certified as compostable.

Why Composting is the Answer

- "Organic waste in landfills generates, methane, a potent greenhouse gas. By composting wasted food and other organics, methane emissions are significantly reduced."
- Compostable Packaging Diverts Food Scraps from our Landfills
  "Compostable packaging is a proven way to collect more of the food scraps that are currently being landfilled or are contaminating recyclables, and instead drive the recirculation of biological materials"

- Composting can reduce or eliminates the need for chemical fertilizers.
- Compost promotes higher yields of agricultural crops.
- Compost can help aid reforestation, wetlands restoration, and habitat revitalization efforts by improving contaminated, compacted, and marginal soils.
- Compost can be used to remediate soils contaminated by hazardous waste in a cost-effective manner.
- Compost can provide cost savings over conventional soil, water and air pollution remediation technologies.
- Compost enhances water retention in soils.
- Compost provides carbon sequestration.
- Composting creates a nutrient-rich fertilizer that can then be used to grow a feedstock to create brand new materials.
- Compostable food service products come from renewable sources. Whether its corn, sugarcane, or paper, everything can be made again in nature so we're using resources at a more sustainable rate than petroleum-based plastic.
- Over 50% of the waste taken to landfills can actually be composted, the bulk of which is food waste. If we removed this waste and composted it, we could greatly decrease the amount of land space that is currently occupied by landfills.

Certification and Labelling Is Not Out of Reach

The City of Victoria's Consultation Paper sites two resources stating, "many plastics labelled as compostable or biodegradable have the potential to introduce microplastics and chemical additives into soil as they fragment into smaller and smaller pieces." While there are companies making fraudulent claims, truly certified compostable products do not contain toxins or microplastics. Introducing penalties for counterfeit products, similar to how organic foods are labelled and regulated by the Canadian Food Inspection Agency (CFIA) and allowing only certified compostable products to be used would be the solutions to these concerns.

The paper also states, "compostable plastics are indistinguishable from conventional plastic products and regularly screened out at composting facilities." Once again, this would be easily solved if petroleum plastics weren't available and compostable plastics were the only material in circulation. In addition, natural colouring and BPI certification labels can be easily added to compostable serviceware products to make them easily distinguishable. With the education of the meaning of a BPI Certified material, composters would not screen out these materials.

What is BPI Certification

BPI Certified compostable products, compost in 90 days or less. By using a scientific process, BPI officially certifies compostable products that meet ASTM D6400 and ASTM D6868 standards for compostability. **"BPI Certification proves that a material will compost in a composting facility, leaving behind no toxic residue or microplastics**."

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Reusable isn't Realistic
Even those with the best intentions to use reusable bags, coffee cups and dishware forget these items at home. Not everyone plans ahead to visit a coffee shop, bakery or restaurant, especially tourists. Should we penalize visitors to Victoria for not travelling with a full set of dishware and beverage containers? Will visitors frequent these stores less because of the additional cost?

UBC implemented a reusable cup initiative in 2019 and although usage has increased slightly, their ultimate goal is only 50%. What about the other 50%?

100% adoption is simply not realistic. Shouldn't we allow the most environmentally friendly alternatives be available when reusable items aren't practical?

Paper is Poison
Paper can't be trusted as a biodegradable solution. Paper products that aren't BPI certified can contain toxins such as PFAS and "forever chemicals" that have been linked to cancer, thyroid disease, hampered immune function, and early puberty, among other ailments. They also can be coated with petroleum plastics which contain toxins and microplastics. Even with paper, labelling must be enforced to be sure it will biodegrade.

Composting is Less Expensive and Not Complicated
Recycling isn't working. "About 86 per cent of Canada's plastic waste ends up in landfill, while a meager nine per cent is recycled." It is confusing for patrons and most of what is collected for recycling ends up in a landfill.

"Collection and disposal costs for recycling are *7 TIMES HIGHER* than those for composting (about $166 per ton for recycling vs. about $23 per ton for composting). Plus, compost done at home is absolutely free!"

Imagine ordering from a fast-food restaurant where your straw, cup, lid, plate, cutlery and leftovers all go into one bin – simple. This is the goal of sustainable, compostable foodware. Where all our waste ends up where it originated, back into dirt with no trace of toxins or microplastics.

We implore you to reconsider and revise the statements made within the Consultation Paper and implement programs that will truly work towards eliminating waste in the City of Victoria.

Thank you for your time and consideration,

Angela Rodenburgh
Global VP, Marketing
Evanesce Inc.

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November 20, 2021

Attention: Zero Waste Initiatives
Engineering and Public Works
City of Victoria
1 Centennial Square
Victoria BC V8W 1P6

This letter is being submitted in response to the City of Victoria's Consultation Paper requesting input on potential solutions for Single-Use Item Reduction as part of its longer term, strategic goal of transitioning to a Zero Waste future in which most items are reused rather than being recycled or discarded and sent to landfill.

Until we can achieve that future state, the City must transition through a reality in which Single-Use items remain a significant source of municipal waste. This submission proposes an entirely new economic model that provides incentives to all actors in the current recycling ecosystem to act for the greater good, simply by acting in their own self-interest. Such virtuous self-interest has numerous social action and other benefits outlined later in the document.

This submission is specifically aimed at solving the problem of Single-Use Paper Cups for both hot and cold beverages and leverages new digital technologies to create a self-sustaining, circular economy that produces recycling rates in the high eighty-to-ninety per cent range and above. While this specific project is initially focused on Single-Use Paper Cups, it is important to understand that the framework outlined below can be generalized and applied to numerous other items such as plastic water bottles, beer cans and wine bottles, or even to reusable containers.

We outline the vendor agnostic requirements for this form of solution that could be written into a future by-law but also describe the specifics of our KUPKrush proposal that we hope to implement. The KUPkrush project is supported and fully funded with more than US$3 million of capital requiring little or no investment by the City, while the operation of the program has the potential to generate several million dollars in non-tax revenue for the municipality, every year.

I look forward to the opportunity to provide additional detail on the platform and the technology behind it, should you wish to understand more about the incredible potential of this initiative.

Yours truly,

Terry Shane
Founder
bIOTAsphere

Attachments: Letter of Support from the IOTA Foundation - Berlin

The KUPKrush Circular Economy Solution for Single-Use Paper Beverage Cups

Problem Overview

For a 7-minute summary of the KUPkrush project, see https://YouTube.com/v/bWWfKNBTikc
A longer webinar is also available here; https://YouTube.com/v/v_9QCz0102k

It is estimated that 600 billion Single-Use Paper Beverage cups are used globally every year and 99% of these, end up in landfill despite being manufactured of high-grade, long-fiber virgin paper stock. The City of Vancouver estimates that cups and take-out food containers make up 50% of the waste in public litter bins and street litter[1] and over 2.6 million cups[2] are thrown away each week at a cleanup cost of over $2.5 million per year.

Very few of these cups are recycled, because they require special processing to remove the thin polyethylene plastic lining that makes the cup waterproof and there are few paper mills equipped to recycle them. With the loss of Asian markets as a destination for North American recycling, the limited demand for used cup stock has generally meant that the cost of separating single-use cups from other waste streams and transporting them to a suitably equipped pulp mill, exceeds the price that the mills will pay for the stock. As Matt Keliher, General Manager of Solid Waste Services for the City of Toronto succinctly put it, "*Every material that is recyclable has to have someone who wants to purchase it or it's not recyclable*,"[3] and used cup stock today has almost no economically viable market, which means that even when it looks like it should be recycled, it is almost always destined for landfill.[4]

Solving this problem is not a recycling issue so much as it is an economic one. If used paper cups were a sufficiently valuable resource in high demand, the problem would take care of itself. While reusable cups offer a tantalising alternative, they too have associated challenges for products that are primarily consumed out of the store where they are sold. While eliminating single-use cups for in-store consumption is reasonable, and actively promoting reusables for takeout coffee, tea and soda drinks is a step in the right direction, the disposable cup will be with us for some time to come and the KUPKrush platform provides an innovative solution to a long-standing problem.

KUPKrush inverts current economic models in the recycling industry by creating lucrative markets for used cup stock, and by extension, other products too. Under this model, Pulp Mills will be paid $1,000 per metric tonne (approximately 1 cent per cup) for recycling used cup stock, a product that has a current market price in the range of $20-$25 per tonne[5]. Other players in the ecosystem such as Materials Recovery Facilities (MRFs) and Cup Manufacturers will also be rewarded with similar incentives based on provable recycling outcomes.

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[1] Disposable Cups - https://council.vancouver.ca/20180516/documents/pspc2b-AppendixA.pdf - Pg 28
[2] The Tyee - https://thetyee.ca/News/2019/04/01/Disposable-Cups-Trash-No-Easy-Solutions/
[3] Hot beverage cups are still a 'top blue bin offender,' city says - CTV News March 2019
[4] The losing economics of recycling – Global News April 2019
[5] Continuous Improvement Fund – Market Trends Price Sheet October, 2021

Single Use Cup Fees – the Latte Levy

To deal with the massive amounts of municipal waste caused by single-use items, several cities have experimented with mandatory minimum charges on single-use beverage cups. Vancouver is introducing a minimum 25¢ charge, effective January 1, 2022[6] and Toronto is considering a similar levy of as much as 50¢ to $1.00. Cities such as Berkeley, California have implemented cup fee schemes[7] but compliance by food service retailers has not been high and in all cases, the retailer keeps 100% of the fee to offset their costs of compliance and because the fee is not technically a tax.

Since most retailers already offer discounts of 10¢-20¢ if you bring your own cup, it's clear that consumers are already "buying" their single-use cups as the charge is included in the cost. Explicitly charging for the cup as a separate item is assumed to raise consumer awareness and actively encourage the use of reusables. In practice, the increased charges may result in one or more of the following scenarios;

- Decreased sales because consumption is elastic – higher price may lead to lower demand
- The higher price becomes the new normal and behavior doesn't change
- Higher margins for food retailers who now get 25¢ for a cup they used to "sell" for 10¢
- Paper cups are still thrown away in huge numbers because the move to reusables is minimal
- The total carbon footprint of reusables may be greater than disposables in practice[8]

Many consumers, commuters and tourists will still prefer the convenience of a disposable cup – reusables are not always convenient, they may not be as hygienic if stale dregs are left in the cup for extended periods, consumers often don't have a reusable cup with them at the time of need or if buying beverages for others, and reusables will also be lost, damaged or broken, leading to their own environmental impacts.

Martin B. Hocking of the University of Victoria published an energy-based evaluation of five different reusable and disposable hot drink cups and determined that paper cups used once and discarded consumed less fossil fuel energy over their lifetime than any of the other cup types examined[9]. Additionally, the substitution of bioplastics for the polyethylene liners in disposable paper cups will increasingly tilt the equation in favor of the paper cup over reusables even though this may seem counterintuitive at first reading[10]. Broad adoption of more sustainable solutions will require an integrated commitment and approach to circular economics. Specifically, this includes changes in consumer behavior and brand owner initiatives to meet sustainability goals and governmental policy, but we need to be sure that our efforts to solve one issue don't lead to unintended consequences that are worse than the original problem we set out to fix.

What is certain, is that every single-use cup that continues to be sold in the present environment will be destined for landfill unless we can provide easily accessible infrastructure at the consumer level for the collection, separation, and processing of paper cups.

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[6] https://vancouver.ca/green-vancouver/cups.aspx

[7] https://www.berkeleyside.org/2020/01/08/berkeleys-new-disposable-cup-law-is-now-in-effect-but-heres-why-you-might-not-realize-it-yet

[8] The Truth About Paper Cups - https://www.youtube.com/v/vFXznoNqRfo

[9] Reusable and Disposable Cups: An energy-based evaluation – M. Hocking, University of Victoria

[10] The Future of Single Use Paper Coffee Cups - N. Triantafillopoulos

New Technologies – Digital Twin and Distributed Ledger

The last five years have seen the emergence of new digital technologies that promise to revolutionize global supply chains and many other aspects of our life. These new technologies provide opportunities to invert existing business models using digital tracking and new data storage and value transfer capabilities.

Instead of producing billions of identical items, digital printing allows us to create unique identities for every individual product via unique barcodes or QR-codes. You can think of these unique identities like the numbers on paper cheques. Each cheque in a checkbook has a unique number representing the bank, the branch, the account, and the individual cheque number, and it's printed with magnetic ink that makes it both human and machine-readable. Each item has a unique digital fingerprint.

This new technology is being implemented by corporations such as Walmart[11], who are using early versions of distributed ledgers to track and trace lettuce and spinach in the event of E.coli contamination. Scanning the unique code on a bag of Dole lettuce will allow them to identify the specific farm that grew the product and even which part of which field the vegetables were harvested from and at what time, all within 2 seconds. Similar initiatives are being implemented for coffee beans[12] and turkeys.

These systems rely on a concept called a Digital Twin – essentially a unique code printed on a physical object which ties it to a digital database-entry containing its lifetime activity in the same way that the unique Vehicle Identification Number (VIN) on your car is associated with the lifetime records of your car's manufacture, options, colors, service history, ownership and sales, accidents, and infractions.

Early Digital Ledger deployments, most notably those using blockchain, are often associated with unsustainable "crypto mining" that are very expensive, use significant amounts of energy, are often slow and are not at all eco-friendly or sustainable. However, just like early developments on the internet were clunky, slow, and inefficient, newer technologies in the Distributed Ledger space are changing the game. The KUPKrush project uses the latest innovations in the space that are completely feeless (free to use) and use so little energy that 22,000 transactions use about the same amount of electricity as that used to make one mug of coffee in a single-serve machine[13] and this figure is only going to get lower with increasing scale and development.

Printing a unique identifier on a single-use paper cup at the time of manufacture, has a zero marginal cost impact but makes new, previously non-viable business models possible and provides unprecedented public and governmental visibility into the life-cycle history of every cup, plastic bottle, beer can, wine bottle, juice box or cereal carton that participates in the system.

From manufacture to sale, from sale to recycling & ultimate reuse, all the data would be public data.

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[11] From Farm to Blockchain: Walmart Tracks its Lettuce – New York Times
[12] Bringing Blockchain to the Coffee Cup – Wall Street Journal
[13] Energy Benchmarks for the IOTA Network – May 2021

How the KUPKrush System Solution works

The KUPKrush platform requires participating cup manufacturers (known in the industry as Cup Converters) to add a unique printed Digital Twin code to their cups at the time of manufacture. This can be done by inline printheads either on the flat cup stock or after the cups have been formed. It's even possible to print a generic barcode on the cups and read the "e-fingerprint" created by natural variations, ink-bleed and the paper fibers to create a unique identity. This technology is already being used to prevent counterfeiting of pharmaceuticals by companies like J&J, P&G, and Merck[14]. The bottom line is that currently available solutions can be implemented to make every cup unique without increasing the cost of manufacture.

Coffee retailers like Starbucks often print a label with your name and order details, that gets affixed to each cup for the "barrista" to know what to prepare. A similar, non-removeable sticky label could also be produced by a Quick Service Food Retailer with a unique, scannable QR-code at no additional cost, in a local test environment during a pilot phase.

Once we can uniquely identify any cup with the camera on a standard smartphone app or a Point-of-Sale scanner we can begin recording data about that cup as it moves along its lifetime journey. In addition to data about its composition (percentage of recycled fiber, type of paper, etc.) the ledger will record information like date, time and place of manufacture, cup capacity, weight, design and so on.

The cup, and the sleeve or carton it is a member of, can be tracked to the retail store where it will ultimately be sold, containing a hot beverage or cold soda drink and this is where it gets interesting.

When the cup is sold, the unique code is scanned, and the consumer is charged a 25-cent deposit fee. This is not unlike other deposit schemes around the world but with one important difference. The deposit is credited to the digital account of the cup and not to the retailer who collected the funds. The retailer has a debit on their account which is automatically tracked in this same process. This is the start of a true Extended Producer Responsibility (EPR) initiative because the funds can now be used to ensure that the cup gets recycled, and to pay for the cost of environmental remediation if it ends up in a garbage can – more on this shortly.

The transaction for the deposit is automatically recorded on the ledger at the time of the sale by the same smartphone or PoS software that scanned the unique QR-code or barcode. When the consumer has finished their drink just a short time later, they can scan their empty cup at any participating retailer or at a dedicated KUPKrush machine and get 10-cents back. This already provides an incentive to recycle the empty cup that is missing from initiatives in Vancouver, Toronto, Berkeley, etc.

The refund is sent digitally back to the user's account, credited to their Coffee Loyalty card, their Grocery Chain Loyalty card, credited to their Victoria Regional Transit System account, or it can be donated to the user's choice of charities, or even targeted to local community initiatives or funding campaigns – "Cups for Causes!"

[14] Systech eFingerprint solutions for Anti-Counterfeiting and Brand Protection

As soon as the empty cup is scanned at the collection point, the coffee shop where it was originally sold is credited with a reward of 2-cents for their participation in the scheme.

The KUPKrush unit or business that scans the empty cup, receives a 5-cent credit for participation in the process, providing income for Convenience Store owners and retailers willing to accept and collect empty cups and compact them. A standard, kitchen compacter available from any appliance store can minimize the space and storage requirements in high-traffic locations and the machine would pay for itself very rapidly[15]. Acting as a site for recovery of the cups would also drive additional foot traffic to the service provider increasing their potential business opportunities. The cost of compactor units could also be subsidized by the city or the province as part of its recycling mandate. Compactors for the pilot project would be 100% funded by the KUPKrush initiative.

Each compactor bag used for recycled cups would have its own unique pre-printed QR Code, so the system can track which specific cups are going into which specific bags. The system is self-checking since we know the weight of each cup in each bag, from the cup's original ledger information and this can be used to accurately predict the theoretical full bag weight and highlight any discrepancies with the actual bag weight upon collection.

The scanning software tracks how many cups a recovery site has processed and when the compacted bag is full or nearly full, an alert goes out on the system, to notify a "collection agent" that a full bag of cups is ready to be picked up. Authorized Collection Agents could be "Ride Share" drivers, Waste Collection Companies, Landlords of malls with multiple food court tenants, coffee shop employees, or anyone with a vehicle who would be willing to collect the full bags and deliver them to a Materials Recycling Facility (MRF). Authorized Collection Agents will receive a reward of about $15 per bag (~500 cups at 3-cents per cup) for every bag delivered and scanned upon receipt at the MRF. Retailers who collect the cups could also opt to capture both fees if they also deliver the full bags to the MRF.

It should be apparent that a coffee shop could easily offer these services as part of its standard operation, scanning cups returned by customers, compacting them in bags, collecting the bags from multiple branch locations and delivering them to the MRF. The coffee shop undertaking this effort would recover their regular 2-cent reward plus the 5-cent and 3-cent incentives, for a total of 10 cents back for ensuring the cups made it to the MRF. They could even collect the rewards for cups sold by competing shops since this system is intentionally not brand-centric but an open, public solution.

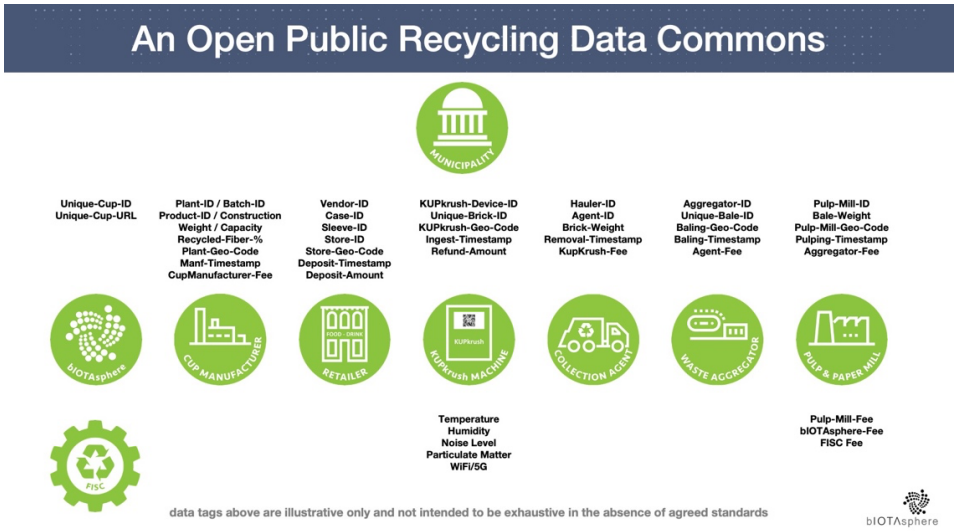
It is important to note that no player in this system receives a payment until cups move further along in the circular economy process and each action is automatically recorded, in an immutable public ledger for total transparency. The same mobile app can also be loaded on a smartphone by consumers allowing them to track the history and journeys of their own cups. Note that at no time does the system require any Personally Identifying Information (PII) and we do not need, request, or store any information about users since we are only interested in the destiny of the cups.

[15] 100 Cups per day x $0.05ea x 350 Days/Yr = $1,750 - Trash Compactor at Lowes.ca – 100% ROI in about 6 months.

The Materials Recycling Facility will scan the bags delivered to their facility and aggregate them in half-tonne bales which in turn will receive a unique QR Code. There is no sorting or separation of cups required since the bags only contain paper cups. The MRF makes easy money for their part in this process and when the bales are subsequently delivered to a Pulp Mill, the MRF which historically has sold this material for about $20-$25 per tonne, would receive $1,000 per tonne (1 cent per cup) for their efforts – that's 400-500 times more than current market prices, and it's funded from the remaining cup deposit. Additionally, the Pulp Mill, which was paying for this material now also receives $1,000 per tonne, as does the cup manufacturer who printed the codes on the original cups.

Each player only receives their digital credit when the cups move one step closer to their ultimate destination on their journey to being recycled back into new cups or other paper products instead of being sent to landfill. The system creates an open, immutable, public, recycling data-commons that can be accessed by all parties at no cost, at any time. This is important both from a transparency perspective since there is currently very little public transparency around what happens to most of the materials that are part of current Blue Box programs, but also from the perspective of true Extended Producer Responsibility and consumer awareness.

The amounts of data produced by this initiative are also quite staggering. Today, Pulp Mills buying post-consumer paper feedstock, really have very little assurance of the quality and integrity of the materials in the bales delivered to them. These materials are purchased based on dock-weight, but water content and other contaminants can play a major distorting factor in the cost. It's also very hard to be sure that the materials on the outside of a bale are truly representative of the interior core which leads to expensive manual inspections and audits or investments in expensive "core-sampling" equipment to assay the bales for moisture content and consistency[16]. Bales are often assayed at the MRF and the Pulp Mill, further adding to cost but with the KUPKrush system, every bale is accompanied by an audit report that details every cup it contains, its size, construction, weight, ink content, liner details and much more. Best of all, this information is available at no additional cost and in advance of leaving the MRF which leads to more efficient markets.



[16] BaleVision paper bale analytics technology

Completing the Circle

Cup Manufacturers now have an incentive to add the codes to their cups at the time of manufacture as they receive a digital payment for every cup that makes its way back to a Pulp Mill, making these products cheaper to produce in the long run than standard cups. The resulting cup-stock can also be sold for less due to the subsidy, ultimately making cups containing previously recycled cup fiber less expensive for QSRs than those made from virgin fiber.

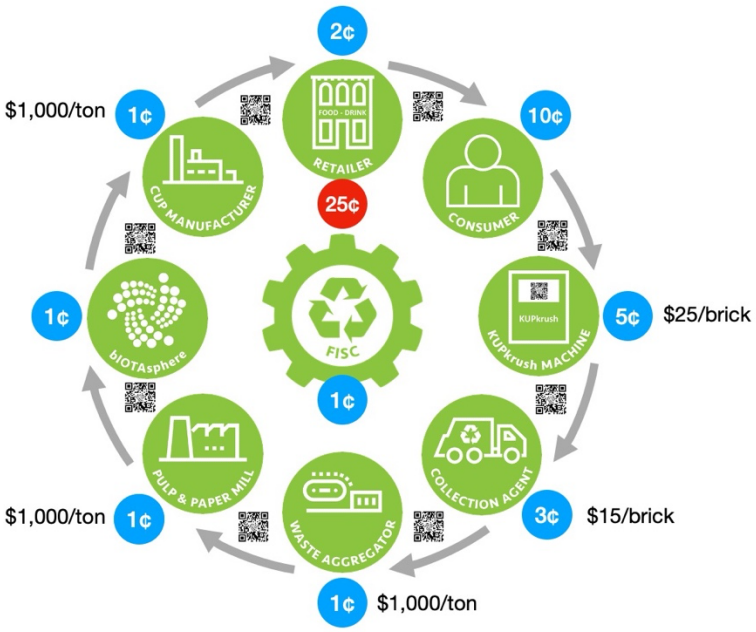
The entire Circular Economy flow can be seen in the image below.

FISC receives a 1¢ payment for providing system governance and oversight and administering the program.

FISC will also be responsible for running marketing and education programs and providing liquidity for the platform.

*bIOTAsphere receives a 1¢ royalty for developing the software and managing the ledger components, issuing the unique cup identities, and providing visibility into the KUPKrush Ledger.

All collected data is part of an open, public, recycling data-commons.



It should be noted that the final 2-cents of the initial deposit are still unaccounted for in the scenario above. The final amounts are used to fund the initial and ongoing development of the KUPKrush software, and the reporting and payments infrastructure that makes it all possible. *The entity responsible for this is represented in the diagram above as the bIOTAsphere – a non-profit organization based in Toronto. We also anticipate the program will be administered by a non-profit, EPR Food Industry Sustainability Consortium (FISC) such as Return-It BC or Recycle BC, with the funds being used for consumer education and marketing awareness to drive adoption and participation. The 2-cent balance will be split evenly between these two parties, and they will only receive their share of the deposit when cups are received and scanned by participating Pulp Mills.

In the ideal scenario shown above, 100% of all cups designed to participate in the KUPKrush framework will be recycled and no cups will be sent to landfill sites because they have all been successfully recycled into new cups or other paper-based products.

Of course, in the real-world there will be “leakage” at every stage in the above process and the system has been designed to deal with this in an elegant fashion. The next section will address what happens when things don’t go according to plan.

What happens to cups that are thrown away?

Previous attempts to reduce the environmental impact of single-use items such as plastic bags, and coffee cups, have relied on penalties alone to change consumer behavior. These "penalties" in the form of explicit charges for items that used to be given away for free (plastic bags, paper cups, etc.) are kept by the retailer and become contributors to their bottom line[17]. While the "fees" are technically intended to be used to cover "costs" and retailers are encouraged to donate the profits to environmental causes, there is no transparency around how much, if anything, is being donated and it's mostly clear that these initiatives represent a profit windfall for retailers who are the ultimate source of the problem, and we're now ironically paying them a bonus to clean up their own mess.

It's not clear that reusables will be adopted in large enough numbers to eliminate the paper cup problem in the short to medium term, and little reason to expect that the paper cups still handed out by Tim Hortons, Starbucks, McDonalds and others won't continue to clog garbage cans and our shrinking landfill sites for years to come. Plastic bag use dropped with mandatory bag fees but is now creeping up again. Some retailers have switched to paper bags, but we have not achieved anywhere close to complete elimination of plastic shopping bags in our daily lives, or a 100% shift to reusables.

Under the KUPKrush initiative, the cup deposits are not controlled by Quick Service Retailers because the funds are transferred digitally to the individual electronic accounts of each cup at the time of sale. With a financial incentive given to a consumer for recycling their cup, there's suddenly a good reason not to toss your empty coffee cup away. Deposit and Return schemes around the world[18] are generally able to achieve results of well above 50% depending on the product but typically in the very high 80% and 90% range, often approaching 100%[19].

These initiatives typically leverage a network of Reverse Vending Machines such as the KUPKrush unit but the cost of installing these machines is often cited as a barrier to deployment. In our case, the automated systems driven by smart Digital Twin and Distributed Ledger solutions ensures that the machines fund themselves with typical payback times of only 6-10 months. In the pilot phase, we can rely on manual scanning, using an easy-to-use smartphone app and a minimally modified kitchen compactor that will be provided to participating collection sites at no charge.

However, even with the 10-cent reward, cups will continue to be tossed away, but the discarded, empty cups now represent a tokenized asset that can be collected and returned by any third party for the associated reward. The KUPKrush system is 100% privacy-respectful and doesn't track the individual who purchased the drink so the reward can be claimed by anyone who finds and redeems discarded cups. This can lead to a variety of Social Action benefits for the local community.

The "Vancouver Binners" host the Coffee Cup Revolution[20] annually to demonstrate what might be possible with a coffee-cup deposit & refund system. Their 2019 resulted in 96,285 cups being

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[17] Plastic bag fees: Helping the environment or big profit for retailers? CTV Vancouver – Dec 2018
[18] Around The World in Deposit and Return Schemes – July 2018
[19] Deposit – Return Schemes – Data and Figures from 16 European Countries. – March 2018
[20] Binners Project – Coffee Cup Revolution

collected and returned from Vancouver streets in just three hours in return for a 5-cent refund. The 2021 event raised this figure to 10-cents per cup, but results have not been released yet.
Groups like the Binners already provide valuable entrepreneurial social services in many urban centers[21] by collecting discarded plastic bottles, aluminum cans and glass bottles, and the addition of paper cups could assist them in earning income in return for this work[22].

Recognizing the embedded value of these discarded items, some European countries even go so far as to design their garbage cans to facilitate leaving items that carry a deposit, separated for others to redeem. This way if a user does not have time to recycle their cup, can, or bottle, they can leave it for others to redeem – paying it forward. A municipality can designate special receptacles in parks and public spaces for consumers to leave their empty cups for others to claim and redeem[23].

The opportunities to monetize discarded cups, or to actively collect cups at workplaces, schools or transit hubs and use the refunds to support charitable causes can be a huge win-win. A place of worship might launch a community campaign funded by donations of clean, empty cups. A school might fund a clean drinking water project in a developing country. The possibilities are endless and since the donations would be targeted to a single "account" identified by its own QR-Code, all proceeds would be visible in real time on the public ledger. It would even be possible to track the ultimate transfer of funds to the project custodians for full transparency.

Since each cup is a unique item, it can technically also act as a form of lottery ticket where it meets local regulations and requirements. A limited number of cups could be pre-selected as "winners" revealing a prize or bonus when scanned for redemption by the consumer. Promotional programs such as Tim Hortons' "Roll Up the Rim to Win" contest could be rebranded as "Recycle to Win" in which even the environment wins. Retailers could additionally "tag" their own cups to generate rewards such as a free snack, or a free drink if you recycle pre-selected "winning cups" or a free drink with every 10th cup recycled – these "rewards" will drive additional foot traffic to the participating brand while reinforcing their Corporate Social Responsibility image as good citizens. As with every other aspect of this project, everything is open, immutable, transparent, and self-auditing but the incentives to ensure that the maximum possible number of cups are recycled, remain compelling.

Despite all the above possible scenarios, there will be a percentage of deposit-bearing cups that never make it back to a pulp mill for recycling. Some cups will be thrown away or lost and never recovered. Some bags of scanned cups may never make it to a Waste Aggregator or MRF. While we believe that the financial incentives should ultimately lead to extremely high rates of recycling, there will always be some level of "leakage" from the system which we anticipate will fall over time as consumers become educated to the way the system works, and as the number of manual and automated return locations rises.

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[21] Calgary's Bottle Pickers: working in their own way
[22] Sure We Can – Recycling in New York City
[23] On-the-Go Beverage Container Recycling Bins – Return-It

Luckily, the Digital Ledger provides a perfect solution to this problem through something called a "Smart Contract" – essentially a computer routine built into every cup's digital account that automatically releases the balance of the unused deposit, thirty days after the cup is sold to the consumer. The "Smart Contract" can be thought of as a pre-authorized withdrawal of any remaining deposit balance, based upon a formula set by the municipality, if the cup is not recycled. These funds can be directed or "donated" to the city to fund environmental cleanup, sustainability initiatives, or any other projects determined by the Food Industry Sustainability Consortium (FISC) in consultation with participating municipalities.

Because the KUPKrush Digital Ledger records the geo-code of the location where the coffee or soda drink was sold (essentially the store address), when funds are released back to the city, they can be specifically targeted to the communities where the cups originated. This is Extended Producer Responsibility in the purest sense and all payments derived from unrecycled cups will be documented and as open to public scrutiny as every other transaction in this system. These funds are also "donated" to municipalities and should not therefore be classified as tax revenues.

Funds from unrecycled units will be split as follows;

- 48% to the Municipality where the cup was sold.
- 28% to FISC to fund Education and Awareness programs and Marketing
- 24% to bIOTAsphere for royalties and to fund deployment of new machines

Because of the capabilities of the KUPKrush system, all funds are either paid out to participants in the Circular Economy, returned to Municipalities to fund local Sustainability and Environmental initiatives, or invested into education and marketing programs or used to fund the deployment of new machines and ingestion points to improve the system's efficiency.

The transfer of funds between parties is completely transparent, while being 100% GDPR Privacy Compliant and is designed to eliminate any need to know any Personally Identifying Information about any participant.

The KUPKrush system is the first of its kind, anywhere in the world. While existing Deposit and Refund schemes incorporate some of these elements, adoption of this initiative would set Victoria apart as a world-leader in sustainability and recycling of what has been a scourge, not only of cities around the world, but of the very retailers who are responsible for the litter they produce.

How could this be incorporated into a future By-Law?

As Victoria considers the design of future by-laws to control and limit Single-Use items in the Quick Service Retail Food Industry, it's clear that the ideal end-goal is a move to 100% Reusable items, subject to some of the caveats highlighted earlier in this document around the true lifetime carbon and environmental footprint of these products. There is also the need to provide options that will not unduly hurt local businesses, especially small single-location retailers.

We propose that Victoria City Council consider alternate options to a flat 25-cent or 50-cent "cup levy" which are most likely to increase consumer costs, reduce business volume for some retailers, and pad the bottom line of large retailers without fundamentally changing consumer behavior.

If we are to create a more sustainable future for our communities and the generations to come, we need to move to Circular Economy models in which our most precious resources are reused and repurposed multiple times instead of being used once and then discarded.

The proposed by-law should provide an environment for a solution like KUPKrush to be deployed as a preferred embodiment of a vendor-agnostic, sustainable business model that can exist side-by-side with a move to encourage the use of reusable containers. We have defined some of the features which any proposed system should incorporate in the list below, bearing in mind that the scope of the project could also be expanded to other products such as Plastic Water Bottles, Glass Bottles, or any item that could or should be recycled.

Required Features of any Approved Circular Economy Solution for Single-Use Paper Cups?

- Uses an Open, Permissionless, Distributed Ledger.
- Retailers are able to participate by buying compliant cups and downloading a free app.
- Must be fully self-funding and provide the necessary incentives to ensure recycling happens
- Must allow for end-to-end tracking for every participating item from manufacture to recycling
- Must provide detailed on-demand reporting by cup manufacturer, retailer, store location, collection point, MRF and Paper Mill and show measurable outcomes over time.
- Feeless to Operate – the system should be completely lossless – i.e. zero transaction fees.
- Requires no Personal Information to be captured or stored so it cannot be mined by retailers.
- Uses or Creates an Industry Standard for tracking items in a Recycling Circular Economy.
- Must create Immutable Data that is immune from deletion or tampering.
- Creates a publicly owned, open recycling data-commons with public access guaranteed.
- Must provide micro-payments and value transfers of 1 cent or less at no cost.
- Must provide for data to be associated with every value transfer at no cost.
- Must provide for data transactions with no associated value transfer at no cost.
- Must provide "Smart Contract" execution at zero cost for the return of stranded deposits
- Must be committed to Open-Source development to eliminate vendor lock-in.
- Must use an Open Standard so items from any manufacturer or retailer can be accepted
    - (cups sold by one retailer must be redeemable at competing retail locations)
- Must always account for deposits and refunds in local currency.
- Must provide full auditability of all data and value transfers.

We have described the features of a potential Circular Economy business framework that addresses the problem of Single-Use Paper Cups in our communities, using a holistic, vendor-agnostic, decentralized and transparent platform that is easily extensible to other items.

It is anticipated that the KUPKrush framework would be deployed as part of a multi-faceted transition to a fully or mostly reusable future state. We propose that a future by-law might be structured to offer Quick Service Restaurants tiered options that they could adopt as part of their legal compliance, consistent with their Extended Producer Responsibility and CSR initiatives.

Option 1: Provide Reusable Cup options within the store.
Offer all customers without a reusable cup, a single-use paper cup at a minimum cost of 50 cents, to be shown as a separate line-item on the receipt.
Require retailers to track the number of paper cups sold per month, and to donate a minimum of 90% of the cup fee proceeds to sustainability initiatives in the community.

OR

Option 2: Provide Reusable Cup options within the store.
Offer all customers without a reusable cup, a single-use paper cup that complies with the Circular Economy principles outlined above. Consumers would be charged 25 cents as their partially refundable deposit, to be shown as a separate line-item on the receipt. Information should be posted on the retailer's web site explaining the program, how the consumer can reclaim their deposit, and how their cup deposit is being used to fund recycling and sustainability initiatives.

In both options, retailers should be prohibited or dissuaded from discounting their prices by the amount of the cup fee to minimize the difference between the beverage cost when consumed in a reusable container and a single-use cup. Providing the two options gives retailers a choice and an incentive to participate in Option 2 where there is no reporting requirement as the system is self-auditing. The reporting and donation requirement of Option 1, prevents retailers from profiting from the imposition of the cup fee.

The KUPKrush system will deliver mobile and desktop apps that provide the required functionality for all Circular Economy participants from consumers to retailers, variety store and other scanning-site operators to collection agents, waste aggregators to pulp mills and cup convertors.

The system will be funded with US$3 million for software and hardware development to run pilot projects in target cities. Beyond this the system will be entirely self-funding. We anticipate that undertaking a pilot deployment in Victoria and the surrounding area might consume 20 million single use cups and would generate between C$1 million and C$1.5 million in revenues for city-based sustainability projects if the achieved redemption rates are between 40% and 60% during the period.

We welcome input from the Victoria Department of Engineering and Public Works on this proposal, including suggestions on how it might be further improved.

Selected Quotes

The KUPKrush System was entered in an International Circular Economy Challenge sponsored by the City of Copenhagen and supported by the cities of Toronto, New York, Glasgow, and Amsterdam. The full submission can be viewed here at the Challenges.dk web site. Below are a few of the unsolicited comments from around the world, responding to the concept, but you are encouraged to read them all by visiting the site and scrolling down the page.

This seems to be one of the perfect uses for blockchain technology I have seen to date. This solution should be widespread and ubiquitous already and I can't believe it hasn't already been thought of and implemented! Having worked with the public sector in Canada, this is exactly the type of Mandate certain provinces are looking for to make an impact both on ESG mandates but also establish them as a leader in the technology and innovation space! Well done and I hope to see this implemented sometime soon! *Noah Z*

I'm always flabbergasted when I read how much of what we think is recycled is actually not at all recycled and becomes garbage/pollution. I live in Vancouver and a few years ago I read that on average the city's recycling waste (don't remember if it was a specific category) made 7 hops before it reaches its destination. There is no real tracking as to what happens after hop 1 as the city is only responsible for the first hand off. From thereon we just need to trust that the industry does the right thing. Looking forward to seeing the full lifecycle of waste/recycling being recorded in a DLT and love how every party along the recycling supply chain gets rewarded to do the right thing. *Herbert*

As a civil engineer and senior leader working in a municipal environment for the past 20 years, I can attest to the absolute need to develop smarter cities. In my opinion the timing is urgent to 'disrupt' and 'reformulate' the business-as-usual approach to the delivery of city services in order to deliver improved level of service at lower cost to tax and rate payers. I have watched many municipalities set 'aggressive' recycling targets and either (1) miss these targets entirely, (2) plateau with limited gains even with significant public education and engagement programs, or (3) celebrate when 60% recycling targets are reached when we should troubled by the other 40% we're missing. The use of distributed ledger technology to provide an incentivized program for all parties in the cup's circular economy is brilliant. The use of IOTA as a feeless DLT is obvious as the only viable approach to manage these small transactions. The data collection opportunity and ability to analyze and adjust rewards to further improve recycling is another great benefit of using a feeless DLT that will be able to scale to a level that will handle the significant transactions. *SmartCity*

What I love about this project is that it considers every step, from the manufacturing, sale, use, and recycling and finds a way to provide incentives to every user. It truly is a win, win, win, win solution. It seems modeled on nature, where the waste of one step feeds directly into another cycle. This project seems very feasible and would be a flagship of just what is possible, benefiting the manufacturers, the users, the recyclers, and the planet. *Kevin Young*

I worked for years with the world's leading QSR and I can speak first-hand about the toll discarded cups have on a brand's reputation. When gutters and ditches are filled with your logo, it angers people and they place the blame at the producer's feet. So, not only does KUPKrush solve a huge environmental issue, but it also provides a solution to the negative impact on brand perception that littering creates. A full closed circle is the only solution to correct this global issue and KUPKrush has nailed it. We need this in our world asap! *Valerie Swatkow*

This project is the expression of a collaborative technical solution that aims to reach an equal proposition for the participants and an environmentally sustainable process and in my eyes this really stands out. KUPKrush is in my opinion a prime example of what a creative and entrepreneurial mindset can bring to the table with a permissionless, open source and fee less technology like IOTA. *Antonio Nardella*

Wow, I thought there would be nothing that could surprise me about the basic idea of cup deposit, but this is really well thought out and innovative. Thank you and good luck! *Nastya Romanova*

19 March 2021

Circular Innovation City Challenge Review Board

Re: Commitment of support for the "KUPKrush Single-Use Paper Cup Circular Economy Recycling" Project

To Whom It May Concern:

The IOTA Foundation is honored to confirm its support for the groundbreaking project, "KUPKrush - Single-Use Paper Cup Circular Economy Recycling" which is being submitted for your consideration and review.

Through agreements in place with the bIOTAsphere, IOTA Foundation and its operating partners have committed to providing a range of support, including but not limited to, use of existing IOTA products as well as professional advisory and development services, licenses of intellectual property and other contributions towards the collaborative success of this project.

The KUPKrush project, through holistic integration with the various stakeholders in a paper cup's lifecycle, enables citizens and organizations to incentivize the adoption of novel techniques towards a more sustainable future. The process defined by the KUPKrush submission and concept, targets implementation of energy efficient, scalable, feeless and privacy centric open source technologies with the intended outcome of creating positive social and environmental change. The KUPKrush solution aims to also be privacy compliant with all international Data Privacy Regulations, and allows the user, and only the user, to control access and utilize the data or information as they see fit using these privacy preserving technologies.

Due to the KUPKrush project being designed according to the following principles, the IOTA Foundation is readily available to contribute to its success and development if it is awarded the benefits offered through its submission for the Circular Innovation City Challenge.

- It is user-centric and allows individuals full control on their own data
- It is privacy-preserving and allows disclosure of only minimum required information
- It is secure since information is verified through an immutable decentralized ledger
- It promotes inclusivity targeting availability regardless of location
- It simplifies adoption allowing integration at the edge and without need of third party central authorities
- It facilitates interoperability from a technology perspective, as well as a business perspective through it's connection of multiple stakeholders in a currently fragmented technical ecosystem
- It leverages a free and scalable resilient public infrastructure based on the IOTA Ledger
- It provides strong technical governance based on open source community development and code review

We believe, along with other professionals we have consulted with globally, that verifiable processes that appropriately and positively incentivize change like the KUPKrush project, are essential to creating global sustainable and environmentally focused economic solutions. In order for this to happen, confidence must exist in an open, transparent, and compliant fashion that connects various stakeholders while protecting their valuable business logic and IP. The KUPKrush project is an important tool to provide this assurance.

Governments and private organizations need to have the confidence that appropriate measures are being taken by the various stakeholders in a circular economy process, and individuals have to trust that organizations and government are adhering to their social responsibilities in order for them to be incentivized to participate. The KUPKrush project enables this confidence.

With the support of our organization, we look forward to contributing to the expansion of the KUPKrush project and it's adoption ecosystems. The intent of this collaboration will result in increased features as an open source based product, high levels of compliance with industry leading privacy requirements, increased use by collaborating technology vendors, and third party industry integrations as the development progresses.

With this letter of support, we therefore acknowledge that the IOTA Foundation hereby offers their intent to support the KUPKrush project, and the endorsement of the initiative and the principles underpinning it.

Please do not hesitate to let me know if you have any questions or we can be of assistance.

Very truly yours,

IOTA Foundation

DocuSigned by:
Per: Mathew Yarger _____ Date/Place: 3/22/2021 03/22/2021
DB50708AAE18404...
Name: Mathew Yarger
Title: Head of Mobility & Automotive, Previous Head of Smart Cities

DocuSigned by:
Per: Dominik Schiener _____ Date/Place: 3/22/2021 Berlin
661E7B4F05004A7...
Name: Dominik Schiener
Title: Chairperson of the Board of Directors