Aalto University
School of Business

Case Study
HP CANADA CO.: A CIRCULAR SUPPLY CHAIN FOR RECYCLED PLASTIC

Group 12

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Introduction

For the past three decades, HP has been an industry standard in its commitment to sustainability, however, the company currently finds itself at a crossroads. On one hand, the company has made important developments in the field of recycling PCR plastics and incorporating them into their products, creating circularity in their supply chain. On the other hand, exogenous shocks like the COVID pandemic have made other, less environmentally friendly, solutions more enticing, and have just brought a general uncertainty to supply chains around the world.

The ultimate sustainability goal for HP is to reach 30% of post-consumer recycled (PCR) plastics in all of its personal systems and printers by 2025, in this case, we will delve deeper into strategies they can use to achieve this.

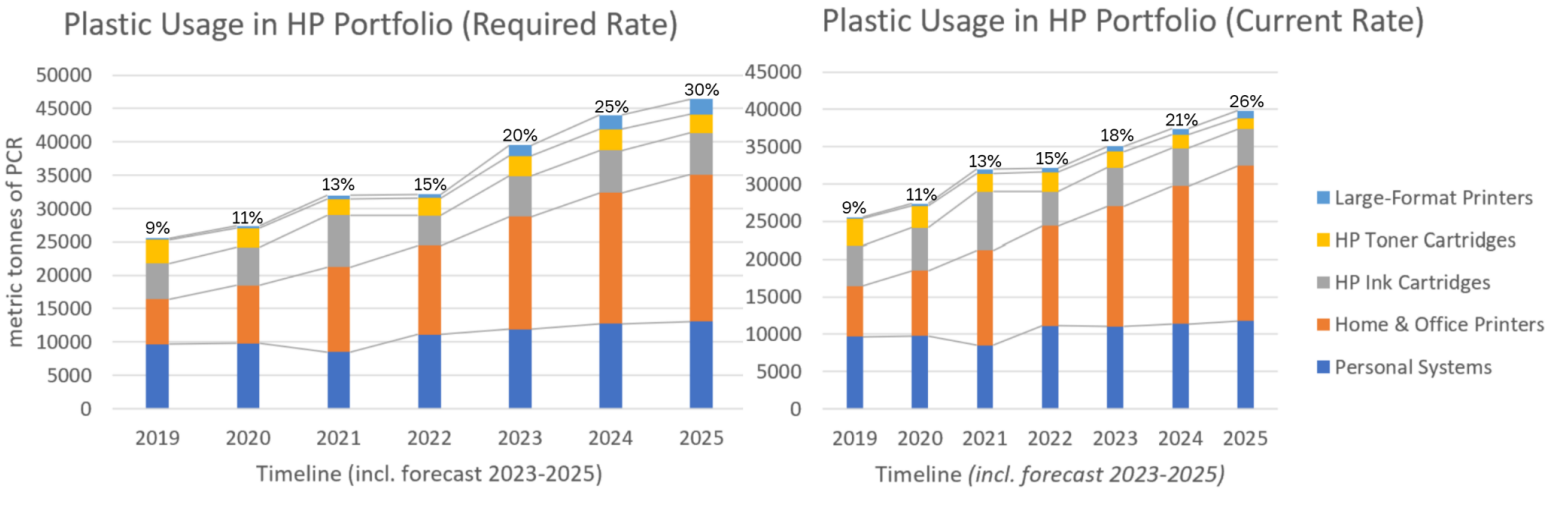
Challenges

To ensure achieving this goal, there are several factors that HP (and their strategic partner Lavergne Group) need to tackle:

- Expanding sourcing options for end-of-life (EOL) plastics.
- Support suppliers such as Lavergne to improve quality and efficiency of recycling
- Engage with manufacturers and consumers to increase perceived values of PCR recycled

Recommendation Plan

We performed a forecast analysis to realise that the current programs and rate of plastic inclusion does not suffice to reach the required rate of 30% PCR plastic usage by HP, hence, drastic and innovative actions are required. The need for drastic change is especially needed in the printers and cartridges divisions of HP since the personal systems division has a relatively steady growth pattern.



Therefore, we recommend the following action plan for HP.

Focus on scope of printing business: Printing is the most profitable business of HP with 16% of EBITDA margin compared to 5% of other businesses and it takes up to 35% of total revenue. Another reason is their sustainability achievements had been in printing products e.g. their introduction of Tango Terra, HP's first certified carbon neutral home printing system. HP seems to worry about the personal systems such as computers due to lack of control over suppliers, however, time is limited as they need to reach their goal by 2025. Printing division needs to be prioritized.

Replicate HP Carbon Neutral Computing Services for Printing Divisions: Personal computing is a product division where HP has an end-to-end carbon footprint offsetting program (HP Inc., 2023). Extending the same program to printing divisions could improve environmental impact with identical offerings: 'to the door' and 'lifecycle' carbon neutrality programs (HP Development Company, 2023). It is pertinent to note that transforming the entire product line to be carbon neutral can be a long term goal, however, immediate steps could be launching printer models that are eligible for 100% carbon neutrality programs.

Stimulate demand from consumers and supply of PCR at the same time: Two of the main challenges for HP's PCR plastic usage is lack of supplies of PCR plastic resins and lack of customer demand. Fortunately, these two have reinforcing feedback with each other, driving up customer demand means driving up supply and more supply creates price incentive which in turn drives up demand. This could be done through a series of marketing techniques such as bringing the impact closer to consumers (recycled materials is from their city), informing them about recycling content history (Polyportis et al., 2022). Secondly, motivating customers through incentive programs. HP already has a lot of these such as HP Education or HP Business Club (HP Inc., 2022). For circular economy goals, they could implement "HP Green Club" that give exclusive deals and support for customers buying green options, for example, offering a 24/7 helpline for any printing-related problems.

Incentivize manufacturers to opt for PCR plastic resins: According to Exhibit A, the price of PCR plastic resin relatively remained stable over the course of 10 years. The price of virgin plastic resins dropped but is predicted to rise again in the coming

years; thus, by opting for PCR plastic resins can potentially have a cost savings effect for manufacturers. Another reason manufacturers were reluctant to choose PCR plastic was because they feared it might require extensive retooling (Gualandris et al., 2021), contrarily, constant technology innovation had made PCR resins a potential replacement for virgin plastics. Finally, PCR plastic resins is a thriving market (Grand View Research, 2023) and the virgin plastic market is decreasing over the years as a result (Chadwick, 2021), if manufacturers want to stay ahead of the game, they should consider PCR plastic resins as a potential material.

Include virgin plastic producers in PCR movement: In our opinion, if HP starts demanding manufacturers to have PCR plastic criterion, their virgin plastic suppliers would easily understand. However, manufacturers could include suppliers in efforts of PCR plastic production.

Share the knowledge in EOL plastic recycling and its safety: Manufacturers are still concerned about the viability and capability of recycling EOL, HP with Lavergne could organise workshops for manufacturers to educate them and offer technical help if they need. In case HP feels confident about the demand for their sustainable products, a certain purchase value could be guaranteed to encourage suppliers and manufacturers.

Improve the resilience of the supply chain: The pandemic and events like the blocking of the Panama canal highlighted the importance of having a resilient supply chain. If HP wants to double down on their circular model, they must have a robust supplier portfolio. To achieve this, HP should:

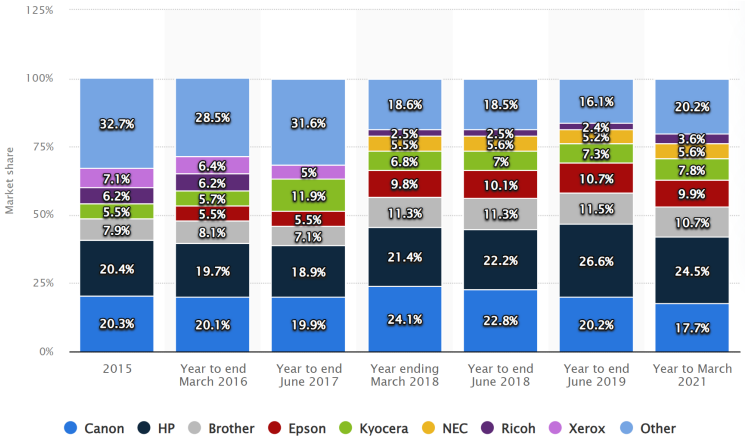
- *Develop strategic partnerships*: Using the relationship with Lavergne as a guideline, HP could benefit from having more partners that could provide the company with the PCR plastics to make their products, but also with the knowhow and how to improve this process.
- *Vertical integration of suppliers of PCR's*: By acquiring smaller companies who have some of the infrastructure and experience in the recycling field, but lack the knowhow or the desire to do so with PCRs, HP could decrease uncertainty in their supply chain, and probably cut costs in the long run

By implementing these two measures, HP can have a bigger pool for PCR plastic suppliers which gave confidence to manufacturers.

Expand their DaaS model: The economic and environmental success of Instant Ink is an indicator of what the future of the industry might look like. HP should get ahead of the curve and explore ways in which they can further incorporate this business model into their strategy. For example, they could give away for a very low price (or even free) the printer itself, if the customer buys the subscription for the cartridges. The benefits being the steady cash flows that a subscription model brings, a higher customer lifetime value, and the astounding carbon footprint reduction that the Instant Ink program already achieved. Another big plus is that the low price of acquiring the printing would attract new consumers, who, in turn, will be loyal to the brand because they are subscribed to the cartridges, thus effectively taking away market share from the competition.

Limitations and possible future actions

Although the company is committed to sustainability, implementing a circular supply chain could result in negative competitive results. Currently, the printer market is crowded with many competitors aiming for HP's top spot. HP should try to maintain their market share and competitive advantages while implementing their sustainability plans.



With the changes in pricing brought on by COVID, competitors could seize the opportunity to offer a lower price point, which as mentioned is the most important criteria for businesses and governments. If HP wants to compete in prices, the decision would be to go back to virgin plastic. However, that is not all the company focuses on, and they are in a strong position nonetheless. HP might just have to sacrifice their profit in the meantime while PCR plastic isn't popular yet.

The local authorities are less motivated for sustainability, hence, they prefer prices as the only criterion. Governments' roles are crucial in driving sustainability efforts. There needs to be lobbying pressure from private sectors and consumers for authorities to stricten regulations for EOL plastics (Ballhorn, 2005). Already, governments could push more incentive for companies to purchase sustainable office devices such as printers and ink cartridges with recycled plastic content.

This is how we anticipate HP to match its aim of adopting more sustainable plastic in its supply chain.

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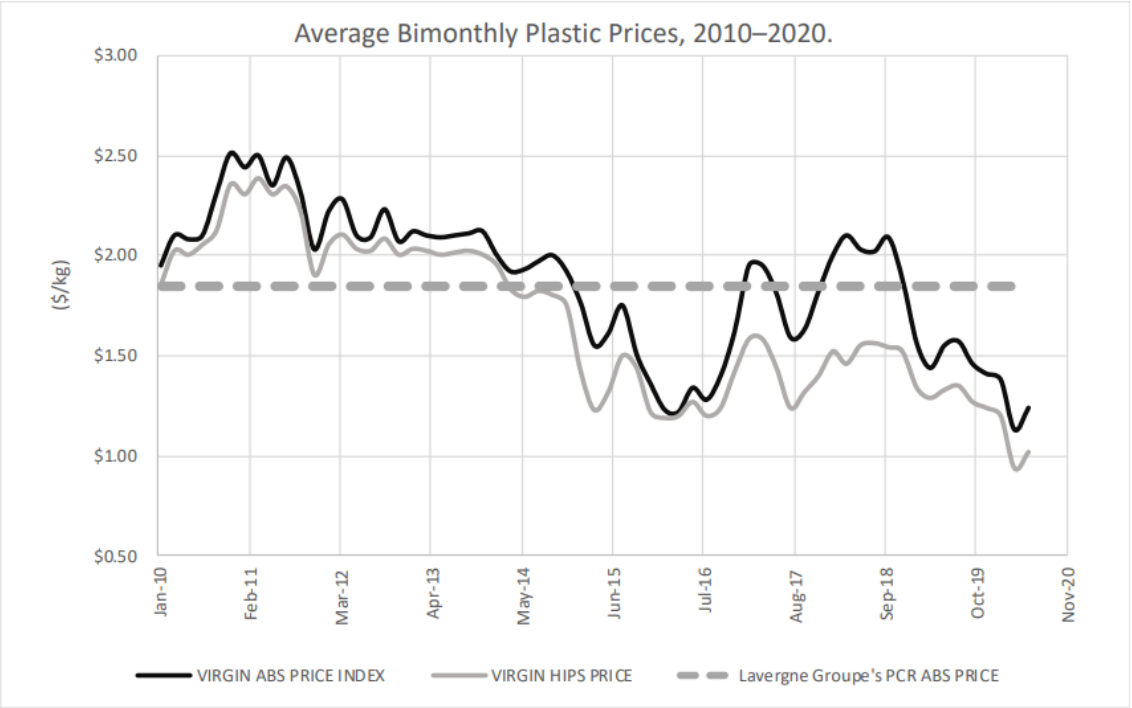
EXHIBIT A


Average Bimonthly Plastic Prices, 2010–2020.
$3.00
$2.50
$2.00
$1.50
$1.00
$0.50
($/kg)
Jan-10
Feb-11
Mar-12
Apr-13
May-14
Jun-15
Jul-16
Aug-17
Sep-18
Oct-19
Nov-20
VIRGIN ABS PRICE INDEX
VIRGIN HIPS PRICE
Lavergne Groupe's PCR ABS PRICE

APPENDIX A

Product Type	2019	2020	2021	2022	2023	2024	2025
Personal Systems	9650	9780	8510	11130	11010	11389	11768
Home & Office Printers	6760	8720	12700	13300	16028	18345	20662
HP Ink Cartridges	5384	5676	7788	4560	5167	5045	4922
HP Toner Cartridges	3565	2913	2414	2600	2133	1810	1487
Large-Format Printers	200	310	560	550	706	832	959
Total PCR Plastic	**25559**	**27490**	**32000**	**32200**	**35044**	**37421**	**39798**
% of Total Plastic Weight at HP	**9%**	**11%**	**13%**	**15%**	**18%**	**21%**	**26%**
Total Plastic at HP	**283989**	**249909**	**246154**	**214667**	**197498**	**176154**	**154809**

** Data prepared using HP Inc. (2021), HP Inc. (2022), and HP Inc. (2023) Sustainability Reports*
*** Forecast prepared using FORECAST.ETS function in Microsoft Excel that uses machine learning method of Exponential Triple Smoothing (ETS) algorithm, which takes into account seasonality, trends, and errors in the data to provide accurate forecasts. We used this to account for COVID 19.*

APPENDIX B

Product Type	2019	2020	2021	2022	2023	2024	2025
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Home & Office Printers	6760	8720	12700	13300	16919	19668	21991
HP Ink Cartridges	5384	5676	7788	4560	6058	6368	6251
HP Toner Cartridges	3565	2913	2414	2600	3024	3133	2816
Large-Format Printers	200	310	560	550	1597	2156	2288
Total PCR Plastic	**25559**	**27490**	**32000**	**32200**	**39500**	**44039**	**46443**
% of Total Plastic Weight at HP	**9%**	**11%**	**13%**	**15%**	**20%**	**25%**	**30%**
Total Plastic at HP	**283989**	**249909**	**246154**	**214667**	**197498**	**176154**	**154809**

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**** Optimised the values to match the target 30% PCR Plastic in HP Portfolio by 2025 in the forecast by using the SOLVER functionality in Microsoft Excel.*