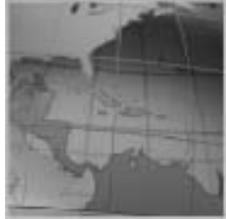


Primary Research



Office Technology & Services



January 2012

2012 Asia Pacific Supplies Recycling

Service Area

Communication Supplies

[Comments or Questions?](#)

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Executive Summary

Remanufacturer findings

- Ultimately, 98% of remanufactured toner and inkjet cartridges are sent to landfill.
- 65% of toner cartridges and 65% of inkjet cartridges are remanufactured from virgin cartridges.
- 35% of remanufactured inkjet and toner cartridges are from non-virgin empties.
- There is a willingness to remanufacture cartridges previously remanufactured by others.
- 31% of unusable toner cartridges and replacement parts ultimately go to landfill. For inkjet, the figure is 43%.
- 56% of collected but unusable toner cartridges and replacement parts are recycled into new products or raw materials. For inkjet, the figure is 44%.
- 13% of collected but unusable toner and inkjet cartridges and replacement parts go to waste-to-energy.
- 20% of toner cartridges and 40% of inkjet cartridges collected by remanufacturers are unusable.
- Remanufacturers rely on brokers for 50% of their toner and inkjet cartridges.
- 90% of remanufactured toner cartridges and 85% of remanufactured inkjet cartridges used in Asia Pacific are remanufactured within the country of use.
- Of the empty cartridges sourced through brokers, 70% to 90% of toner empties and 80% to 90% of inkjet empties are sourced from within Asia Pacific.
- For toner cartridges, over 80% of the time the OPC and blades are replaced on virgin cartridges. This reduces to 30% for non-virgin cartridges.
- 50% of the time the toner primary charge roller (PCR) is replaced on non-virgin cartridges, shrinking to 25% of the time for virgin cartridges.

Refiller Findings

- Ultimately, 92% of refilled toner cartridges and 96% of inkjet cartridges are sent to landfill.
- 75% of toner cartridges and 70% of inkjet cartridges are refilled from non-virgin cores.
- 25% of toner cartridges and 30% of inkjet cartridges are refilled one time.
- Toner cartridges are refilled between five and nine times, on average.
- Inkjet cartridges are refilled between five and eight time, on average.
- 78% of the unusable toner cartridges and parts collected by the refilling industry—parts they cannot use or sell—will ultimately go to the landfill. For inkjet this number increases to 89%.
- Of the unusable toner cartridges refillers collect, 3% are sent to waste-to-energy and 19% are recycled. For inkjet, 9% are sent to waste-to-energy and 2% are recycled.
- On average, 90% or more of the toner and inkjet refilled cartridges are sourced in-country.
- For those who report replacing toner components, the OPC drum is replaced on the 3rd to 4th refill cycle. Other parts are replaced 20 to 30% of the time.
- Refillers have no problem refilling a cartridge previously filled by someone else, but usually the customer returns to the same refiller.
- All refillers keep spare cartridges on hand in case the customer's cartridge cannot be refilled.
- 75% of empties come from their customers, while 25% are sourced from their own collections and brokers.

Glossary

While reviewing this document, it may be helpful to keep the following definitions in mind:

- **Cartridge Waste:** Cartridges and components that can no longer be profitably remanufactured or refilled.
- **CISS:** A continuous ink system (CIS), also known as a continuous ink supply system (CISS), a continuous flow system (CFS), or an automatic ink refill system (AIRS). All such bulk feed ink systems are methods for delivering a large and practically unlimited volume of liquid ink to a comparatively small inkjet print head.
- **Clone/Compatibles:** Any non-OEM, newly made printing supplies that are compatible with specific imaging devices and are not remanufactured or refilled.
- **Counterfeit:** Any product that is labeled and packaged to look like an original OEM product in such a way that it would deceive or mislead a customer into thinking that the product is a new HP product (whether there is intent to deceive or not).
- **Empty:** A used cartridge that might be suitable for re-use or recycling.
 - **Virgin Empty:** An empty cartridge that has not been remanufactured.
 - **Bad Virgin Empty:** A virgin empty that cannot be remanufactured or one for which there is no market.
 - **Good Virgin Empty:** A virgin empty that can successfully be remanufactured.
 - **Non-Virgin Empty:** An empty cartridge that has previously been remanufactured.
 - **Bad Non-Virgin Empty:** A non-virgin empty that cannot be successfully remanufactured or one for which there is no market.
 - **Good non-Virgin Empty:** A non-virgin empty that can be successfully remanufactured.
- **Extra/Wrong Vendor:** Cartridges from vendors that the remanufacturers do not accept.
- **Final Disposition:** What happens to a cartridge at the end of its life (sent to landfill, recycled, or waste-to-energy).
- **Hulk (core):** An empty cartridge of any kind.
- **Inkjet cartridges**
 - **Integrated Cartridge:** The ink tank, which contains the ink supply, is attached to the print head.
 - **Ink Tank:** The ink tank is separate from the print head, which is a permanent part of the printer. Therefore, replacing the ink supply requires that only the ink tank be purchased.
- **Recycling:** Crushing or melting components for use in other products or industries.
- **Remanufacturing Recycling Ratio:** Share of remanufacturing waste that is recycled rather than sent to a landfill or incinerator.
- **Refilling:** Refilled cartridges may be sold as a product or a service. As a product, a refilled cartridge is when a customer takes a cartridge to be refilled with toner/ink and then (typically) has the same cartridge returned. As a service, refilled cartridges are used in businesses as a managed service. Refilled cartridges are not typically re-packaged or branded. Refilled cartridges are priced significantly lower than remanufactured cartridges.
- **Remanufacturing:** The practice of cleaning, servicing, refilling, and reusing cartridges. Remanufactured cartridges are produced when a business collects empty used cartridges, sending them through a production process and usually selling them in branded boxes to end users or the channel. They typically are repaired by replacing some components. In the case of toner cartridges the drum, PCR (Primary Charge Roller), wiper blades and other components may or may not be replaced. In the case of inkjet cartridges, the cartridges are typically opened and cleaned from the inside and

then refilled. Remanufactured cartridges carry a considerably higher price than refilled cartridges.

- **Spares:** Extra cartridges that refillers have available to sell to customer if the customer's cartridge is no longer refillable. The spare could be either remanufactured, refilled, or a new clone cartridge.
- **Toner Kits:** Supplies that typically separate the toner and drum into individual units, versus an all-in-one cartridge where the toner and drum are in one unit.
- **Waste-to-energy:** The process of creating energy in the form of electricity or heat from the incineration of waste source.

Introduction

Over the past few months, InfoTrends interviewed 27 remanufacturers and 29 refillers, and three brokers in the Asia Pacific in the supplies industry regarding their supplies collection and recycling programs. Respondents in Australia, China, India, Indonesia, Malaysia, South Korea, and Thailand were surveyed about their business practices.

Remanufacturers

Remanufacturing Industry

Asia Pacific is a fragmented market with the remanufacturers frequently relying on a local clientele. The challenges in the market can be considered unique compared to other markets around the world. While some countries, like China, have very large remanufacturing operations that export, overall the business model is based on small remanufacturers that generally sell within their own country.

Competition among remanufacturers for the empty cores upon which they rely on is high, due to more brokers entering the market. In addition to local competition for empties, there appears to be a growing Chinese presence in other Asia Pacific countries and a perception among respondents that the Chinese are taking cartridges back to China.

The Asia Pacific toner and inkjet cartridge market competes with refilled cartridges as well as ubiquitous clones. Generally positioned as lower in price than OEM cartridges but higher in price than either refilled cartridges or even clones, cartridge remanufacturers need to maintain quality or risk having the market shift to those lower priced options.

Asia Pacific is not a homogenous market. For example, practices in Australia are very similar to the United States in terms of low reuse of non-virgins and other similar metrics. In many ways, China represents the other extreme with a very high use of non-virgins. All other countries in the region fall in between.

It is evident that practices across Asia Pacific vary greatly by country unlike other regions, but it is impossible to ignore the influence that China has on the region in terms of both empties collection and sale of finished cartridges, whether they are remanufactured or clones. This could disrupt the equilibrium within the region as a whole, but can also help as many used cartridges and parts are recycled.

Empties and Collections

In order to remanufacture toner and inkjet cartridges, remanufacturers require a steady, consistent source of quality empties. InfoTrends found that 20% of toner cartridges collected and 40% of inkjet cartridges collected are not acceptable for profitable remanufacture due to damage or the type of cartridge not being needed. A cartridge that

is not needed means it is the wrong vendor type, wrong ink tank, or that the cartridge model is not in demand. A cartridge that is not needed means it is the wrong vendor type, wrong ink tank, or that the cartridge model is not in demand. Ink cartridges that are not needed are usually cartridges for which there is a lively clone market, making remanufacturing financially unattractive.

On average, remanufacturers in Asia Pacific rely on brokers and their own collection programs. In most countries, dependence on brokers has not changed, but in India respondents consistently indicated that there are more brokers in their market today. Overall, remanufactured inkjet and toner empties are sourced evenly from a mix of brokers and their own collection as shown in the table below.

Table 1: Percent of Empties Collected

Brokers	Own Collections
50%	50%

The remanufacturers interviewed would like to collect more empties themselves but acknowledge that self-collecting is becoming more difficult, because more brokers have entered the market resulting in more competition for the empties. Brokers focus collection on virgin cores, and typically sort empties by model and whether it is a virgin or not. Brokers also sort for clone cartridges. Brokers do not certify their empties or guarantee recyclability but may give credit for defective empties. For remanufacturers to collect their own cartridges, they rely on all channels including customers, schools, charities, and resellers. Partnering with resellers as a source of collections is growing.

With the exception of Australia, the other countries report a large majority of their empties are sourced from within their own country. On average 70% to 90% of the toner empties and 80% to 90% of the inkjet empties come from within their country. On the other hand, Australia was the reverse—reporting as much as 70% sourced from China. In short, much of the empty sourcing remains rather local. Remanufacturers and brokers work with charities, end customers/companies, and increasingly with supplies resellers as a collection channel. While resellers as a collection channel is not dominant, it is the growth area for collections.

In China, the respondents universally said that empty collections are becoming more difficult because competition for empties has been increasing, with more brokers entering the market. Excluding China, the other countries were evenly divided on whether it was either harder or easier to collect empties. Across the region (except for Australia), there are more collectors entering the market.

Collecting toner kits for remanufacturing had mixed responses with many noting that the Chinese made clones of these products. Ironically, in China, there appeared to be a strong desire to collect toner kits because they are easy to remanufacture. Buying Chinese-made toner kits for clones is cheaper than the cost of remanufacturing collected toner kits.

Virgin vs. Non-Virgin Cores

The remanufacturing industry tends to favor virgin cartridges because they are more predictable, and they can be remanufactured more reliably because the remanufacturers know what to expect. In terms of country differences, Australia focuses on virgin cores, whereas China and other countries are more willing to remanufacture their own cartridges as well as cartridges from other remanufacturers. On average, however, the

majority of cartridges remanufactured in Asia Pacific use virgin cores, as indicated in the table below.

Table 2: Type of Cartridge Core Used in Remanufacturing

Core Type	Toner	Inkjet
Virgin	65%	65%
Non-Virgin	35%	35%

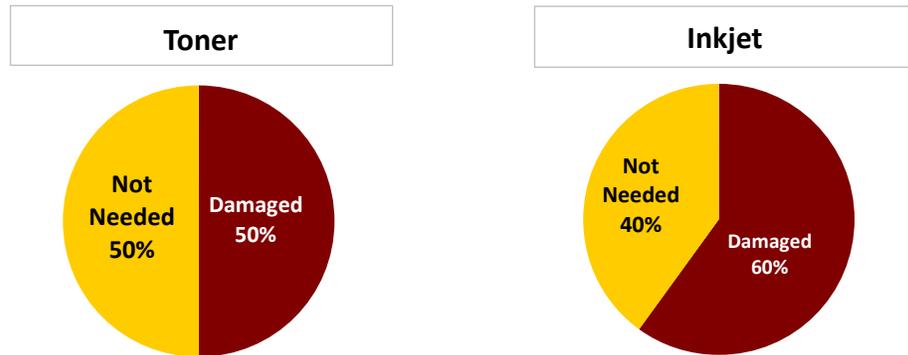
While the use of virgin cores in remanufacturing is important in the Asian market, it is quite a bit lower than a similar statistic in the United States. As a point of comparison, in the United States the share of cartridges from virgin is 81% for toner cartridges and 90% for inkjet cartridges. There is variation in these numbers for Asia; Australia is very similar to the US for toner and ink cartridges while, for China, toner is closer to 50% virgin/50% non-virgin; other countries range from 65% to 70% virgin. China interviewees commented that their virgin collection was higher in the past—up to 70%. The reduction is likely due to the difficulty in collecting virgin empties in China.

On average, 90% of the virgin cores are suitable for remanufacturing inkjet and toner cartridges, compared to only 70% of non-virgin cores. China was the most likely to note successful remanufacturing for either virgin or non-virgin while Australia remanufacturers were more likely to say that the non-virgins were no good. Otherwise, there was not a wide variance on responses between other countries.

Unusable Cartridges and Cartridge Parts

Inkjet cartridges are considered delicate and require proper handling for successful remanufacturing. Because of this, there is a higher rate of damage for inkjet cartridges and, therefore, there is a higher volume of cartridges that are not usable. 40% of inkjet cartridges collected are deemed unusable; of the 40%, about 40% are not needed while the remaining 60% are damaged. Australia respondents indicated a higher rate of inkjet cartridges not needed while China respondents reported more damaged inkjet cartridges. For toner cartridges, we found 20% of the empties received by remanufacturers are considered unusable, where half are damaged and the other half is not needed. There is insignificant demand for remanufactured toner kits since new compatibles for kits are so readily available.

Figure 1: Distribution of Unusable Cartridges



For Asia Pacific, the average number of times a toner cartridge can be remanufactured is 1-2 times, but is closer to 2. Some reported remanufacturing a cartridge 3-4 times. For inkjet, it is 1-2 times. In reality, the remanufacturers report that they would get good

results even if they increased the number of cycles, but it's more a limitation of the lower likelihood of collecting a cartridge multiple times than it is ability to remanufacture.

Remanufacturers almost always replace the drum and blades when remanufacturing a virgin core, while other components are replaced less frequently. When remanufacturing a non-virgin, the drum is replaced less frequently because a long-life aftermarket drum has most likely been installed. But the other components are frequently replaced since they were less likely to have been replaced on the first cycle.

Frequency of component replacement is lower in Asia Pacific when compared to the US. Australia is similar to the US, but China and India do not replace components as often. We suspect that the lower component replacement rates suggest a lower quality standard requirement for Asia.

Table 3: Frequency of Component Replacement in Toner Cartridges

Components	Virgin Cores	Non-Virgin Cores
OPC Drum	80%	30%
Cleaning & Developer Blades	70%	30%
PCR	25%	50%
Developer Sleeve	NA	NA

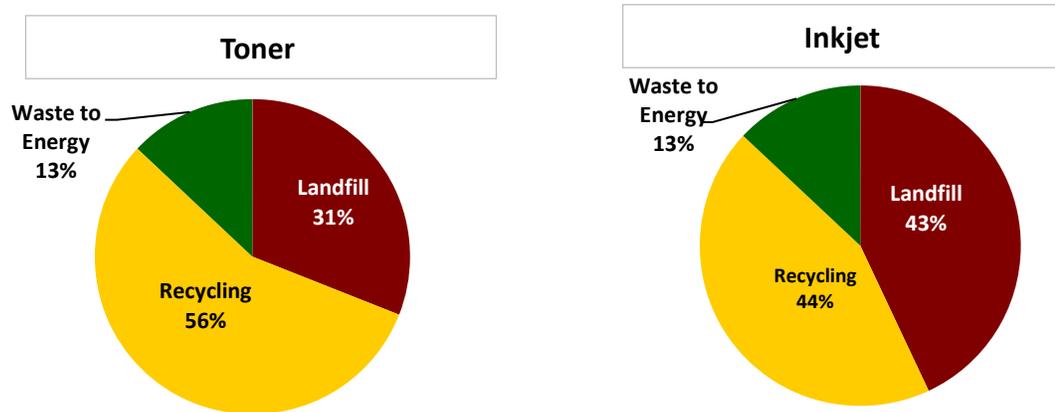
Cartridge End-of-Life

What happens to a remanufactured cartridge when it's deemed no longer useful for remanufacturing? The research shows that almost all remanufactured toner and inkjet cartridges end up in landfill. The table below shows the share of end-of-life cartridges that end up in landfill. It includes cartridges that the remanufacturer never collects and the user/customer discards, as well as cartridges that the remanufacturer has collected that have reached their end-of-life (including waste which can include damaged cartridges and cartridges not in demand, as well as components that have been removed in the remanufacturing process).

Table 4: Percent of Cartridges That End Up In Landfill

Toner	Inkjet
66%	78%

This statistic above includes the waste that the remanufacturers have, as well as the cartridges that users throw away. The following chart shows what the remanufacturers do with the cartridges and parts that they collect but can't use or sell.

Figure 2: Remanufacturers' Cartridge Waste

China reports lower landfill rates while other countries report significantly higher landfill rates, which are more consistent with practices in the US. China's higher rate of recycling is due to the presence of a significant market for waste material. Many Chinese respondents reported a market for scrap plastic and other materials, where someone will pick up the waste without a fee. They also report that people go through the trash looking for saleable waste including plastic and metals. This process is referred to as scavenging. A few Chinese respondents stated that they sell the empty toner cartridges to the waste recyclers, for about 2 cents per kg. It is clear users are also able to sell their scrap to waste recyclers as the waste has value as a recyclable material. So, significant volumes of unusable cartridges are recycled. Overall, respondents for Asia Pacific were aware that much does end up in landfill but that diversion to recycling is significant too.

Australia respondents report sending bad cartridges to Planet Ark and selling the waste back to China either as cartridges or waste for recycling. India and S. Korea report significant waste to energy with government support for waste to energy activities. In South Korea a respondent indicated that, "We have very restrictive garbage recycling system, so even completely broken cartridges, at least we can separate the unusable cartridges for raw material recycle, under the government rule."

When the remanufacturing industry in Asia does not collect a cartridge at its end of life, and it remains in the user hands, respondents report a higher likelihood for cartridges that will go to the landfill than if the cartridge remained in the remanufacturers' hands. Many cartridges are thrown away by remanufacturers but in China particularly they report selling the material. There were comments that many components are composite materials and therefore are not easily reclaimed as plastic or other metal parts.

Remanufacturing Location

The majority of the respondents believed that most of the remanufacturing for toner and inkjet cartridges is conducted within their own country. China is a net exporter of finished cartridges and does not import into China for domestic use. Conversely, Australia reports that domestic remanufacturing is dying out – replaced by other Asian imports, mainly China. Other countries' domestic production is at least 50%, but they also import from China.

Table 5: Source of Remanufactured Cartridges for Sale in Asia

Toner	Inkjet	Source
90%	85%	◀ In-Country
10%	15%	◀ Other Asia
0%	0%	◀ Rest of World

Refillers

Refilling Industry

In Asia Pacific, refilling is a local activity and is generally a small business. Because of this, customers return to their local, preferred refiller repeatedly. There is an opportunity, with this relationship, to engage with their customers about how to handle cartridges that have reached end-of-life, but this does not happen. Rather refilled cartridges are left to the last holder for proper disposal, and the options are slim as we will see in the rest of the report. China has influence across the Asia Pacific region, not specifically with selling refilled cartridges in other countries, but in the collection and recycling of usable and unusable cartridges. China's recycling market has influence across many countries in Asia, and is a destination for shipping unwanted cartridges.

Empties and Collections

Customers usually arrive at the refiller with their empty inkjet or toner cartridge in hand. In fact, end-users provide most of (70% to 80%) the empties the refiller needs.

Because not all cartridges the customer brings can be refilled again, refillers must keep spares on hand. In some cases, refillers will sell ready-to-use remanufactured cartridges, or they will sell OEM or clone cartridges. But they also have spare empty cartridges for refill, which they have had to collect or buy. For those empty spares that refillers need, the respondents report relying on their own collections for 50% and replying on brokers for the other 50%.

This is similar for both toner and ink. China, Australia, and South Korea toner cartridge refillers most frequently said they would sell a customer a remanufactured cartridge or an OEM toner cartridge (which may be counterfeit), while in India and Thailand toner cartridge refillers said they are much more likely to sell a spare refilled cartridge. For inkjet cartridges, Australia inkjet cartridge refillers said they would sell a new OEM cartridge, while other countries' interviewees said would most likely sell the customer a spare refilled or remanufactured cartridge.

The refillers' own collection programs use the same sources as remanufacturers, which include charities, customers, companies and resellers. Refillers suggest that over time they may rely more on brokers because the number of brokers is increasing in the market and, as a result, self-collection is becoming more difficult. Because refillers' demand for empties is small, Asia Pacific refillers do not have a great deal of experience working with brokers.

Virgins vs. Non-Virgin Cores

As with remanufacturers, refillers experience different success rates with using virgin and non-virgin cartridges. They also have different success rates with cartridges that customers bring in for refilling vs. those that they collect or buy as spares. Fairly consistently, Chinese refillers report fewer suitable empties while Australian refillers

report a higher estimate of good cartridges. This is consistent for inkjet and toner. The table below shows the share of cartridges that are usable by those different categories.

Table 6: Percent of Refiller Cartridge Collections That Are Usable

Core	Spares	Customers' own cartridges
Toner		
Virgins % usable	85%	90%
Non-Virgins % Usable	70%	75%
INKJET		
Virgins % usable	85%	90%
Non-Virgins % Usable	65%	70%

Refillers do not mind refilling previously refilled cartridges. Respondents report that they are refilling non-virgin toner cartridges 75% of the time while they are refilling non-virgin inkjet 70% of the time. There was strong variability between respondents on this question but little variability by country.

A large majority of the Asia Pacific respondents will refill an inkjet or toner cartridge that has been refilled before by someone else, but prefer to refill a virgin OEM. Several refillers mentioned not liking to refill a remanufactured cartridge due to poor workmanship of the remanufacturing. Similarly, refillers don't like to refill inkjet or toner clones either because they are considered to be cheap products. Some refillers claim performing 20-40 refills on an integrated inkjet cartridge, but this is not the average. In fact, most of the cartridges that have been refilled before are non-virgin cores as detailed in Table 7 below.

It's interesting that the data in Table 7 is very much the reverse of what the situation is with remanufacturing. With remanufacturing, most cartridges are remanufactured from virgin cores, yet most refilling is performed on non-virgin cores. The difference is due to the fact that refilling is a very local activity, and thus customers come back with the same cartridge over and over.

Table 7: Refilled Cartridges Core Type

Core	Toner	Inkjet
Virgin	25%	30%
Non-Virgin	75%	70%

Table 8 below shows how frequently a cartridge will be refilled. Refillers report that they refill a toner cartridge 3-4 times before any of the internal components, including the drum, are replaced; or 5-9 times on a toner cartridge if components are replaced. For inkjet, they report what we regard as extraordinary; refilling the same inkjet cartridge 5-8 times. There are no components to replace on inkjet cartridges.

Table 8: Number of Times Cartridges are Refilled

Toner	Inkjet	
35%	30%	• % of cartridges that are refilled one time.
5-9	5-8	• X times a cartridge is refilled
3-4	NA	• X times a cartridge is refilled before the drum is replaced

Refillers report that they will replace the drum and other components quite often on toner cartridges: 30% of the time was not an uncommon response. Other refillers reported in terms of cycles – on the 3rd or 4th cycle were common. Several respondents reported changing a part for every 2-3 years of cartridge use. The table below show how frequently the refillers interviewed replace components on supplies.

Table 9: Refillers Replacement Rate by Type of Core

Component	Virgin	Non-Virgin
Drum	25%	15%
PCR/Other	20%	30%

Unusable Cartridges and Parts

Like remanufacturers, refillers also receive a share of cartridges that cannot be profitably refilled. This share is higher for inkjet since these cartridges are more susceptible to damage. The table below shows the share of cartridges that cannot be refilled.

Table 10: Share of Cartridges That Cannot be Refilled

Toner	Inkjet
20%	25%

Cartridge End-of-Life

Many respondents believe that ultimately, the large majority of refilled cartridges end up in landfill. Similar to the remanufacturers, there is a significant amount of recycling the toner and inkjet cartridges among refillers in China because of a market for waste plastic and other materials. There is a significant amount of scavenging in China such that a share of used cartridges that would be discarded by users is diverted to recycling. Toner cartridges have a higher percentage of recycling than inkjet cartridges due to their larger physical size and ease of collection. Australia frequently mentioned sending waste to Planet Ark for recycling or selling waste to China.

The table below shows what happens to cartridge waste that remains in the hands of refillers when they are deemed to be end-of-life.

Table 11: Refillers' Cartridge Waste

Toner	Inkjet	
78%	89%	◀% of unusable cartridges and components that go to the landfill
19%	2%	◀% of unusable cartridges and components that are recycled to new products or raw material
3%	9%	◀% of unusable cartridges and components that go to waste to energy

Table 12 shows InfoTrends' estimate for the share of refilled cartridges that ultimately end up in landfill. Some of the cartridges below are sent to landfill by refillers, but the larger share is discarded by users as they are never recollected by refillers.

As has been a theme in Asia, in China there is significant reporting that scavengers or others will sell end-of-life cartridges to recyclers. However, the majority is not recollected at end of life; rather, it ends up in landfill.

Across Asia, a large majority of respondents report that if the cartridge cannot be refilled, they give the cartridge back to the user and the user will most likely throw it out. An exception is that in China and India, about half of the refillers reported that they sometimes ask the customer if they can dispose of the cartridge for them and, if they do, they sell it to a waste recycler.

Table 12: Share of Refilled Cartridges Ultimately Ending Up In Landfill

Source	Toner	Inkjet	
Total Bad Cartridges	92%	96%	% of refilled cartridges sold which will ultimately be thrown away due to refillers lack of recycling. * Between 99% and 100%

Refilling Location

Refillers believe that 99% of the refilled cartridges sold in their respective countries are refilled in-country. 1% of refilled cartridges may arrive in country from other Asia sources. The reason for this is that refilling is a very local activity. Because refilling is so local, 90% or more of the empties refillers use are sourced from their own country. Most are from their own customers. The table below details the refilling location for cartridges in Asia Pacific.

Table 13: Source of Refilled Cartridges Destined For Sale in Asia

Toner	Inkjet	
98%	99%	◀ In Country
2%	1%	◀ Other Asia
***%	***%	◀ Rest of World
		*** Negligible

Summary

Asia Pacific is a group of different countries with strong contrasts between several of them. Most notably among the sample, Australia very much resembles remanufacturing and filling practices in the US, whereas China in many ways is on the other end of the spectrum. Across Asia Pacific, perhaps with the exception of Australia, we see more willingness to remanufacture a cartridge a second time. We also see a broad willingness to remanufacture a cartridge that had been previously remanufactured by a different remanufacturer. This contrasts with research conducted in other regions where remanufacturers are reluctant to work with other remanufacturers' cartridges, because they are unfamiliar with the parts that are inside the cartridge and how the cartridge was processed.

Despite the heterogeneity of the market, China influences the region. China ships remanufactured cartridges and clones across the region and the world. China does not import finished cartridges but is a large collector of empty cartridges across the region. China is also a destination for unusable plastic and metal waste. Because of the influence of China, overall remanufacturing landfill rates are significantly lower than in other world regions. For example, the Asia average landfill rate for remanufactured toner cartridges is 66%; that contrasts sharply against 93.6% in the United States. Reasons for the difference are a willingness to remanufacture cartridges a second time and an active market for scrap.

Asia Pacific has a very active refilling market in the region. In fact, refilling is more focused on toner cartridges than inkjet cartridges in Asia. There is very little refilling of toner cartridges in the United States. Refilling in general remains a very localized business and is less impacted by Chinese influence compared to remanufacturing. China has less influence on the local markets because refillers receive the majority of their empties from walk-in customers, and cross-border trade does not exist for refilled cartridges to any significant degree as it does with remanufacturing. Landfill rates are higher with refilled cartridges than they are for remanufactured cartridges probably because the refilling players tend to be smaller, and the users are more likely to be small businesses with less access to recycling and less motivation to recycle. Consequently, the landfill rates for refilled cartridges are significantly higher than for remanufactured cartridges.

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