Our Global E-Waste Challenge and the Need for Leadership

The Linear Model – An accelerating problem

Technology today is an integral part of modern life and in recent years, it has been evolving so rapidly and pervasively that there is now a corner cabinet in every household laden with charging cables, old mobile phones or laptops which are either defective or too outdated to use. IT waste is becoming ubiquitous.

Let's take mobile phones as just one example from the world of technology. If we consider that 63% of the global population currently owns a mobile phone and – on average – they are getting a new one every 2-3 years, as many as 4.78 billion mobile phones will become outdated and be replaced by 2020.

The opportunity this challenge represents becomes tangible when we start to consider the valuable metals and minerals tied up within these devices. Let's use the very popular iPhone as a stand-in for the 'average' phone. Each iPhone contains 0.034g of gold, 0.34g of silver, 0.015g of palladium and less than one-thousandth of a gram of platinum. Scale that up to the 4.78 billion total phones in circulation and you have the equivalent of 162.5 tons of gold, 1625 tons of silver, 71.7 tons of palladium and 4.78 tons of platinum.

When we then account for the impact of mining these minerals, say gold for instance, we realize that the cumulative impact of gold mining for phones releases 2.75 million tons of C02, equivalent to 2,290,750 acres of pine forest absorbing CO2 for an entire year. That would be a forest about the size of Puerto Rico.

These numbers represent the impact of just one rare earth metal. Mitigation of this impact, as well as capturing the efficiency and value that recycling these valuable materials tied up in phones and other end of life e-waste assets, is a key focus in trying to shift to a circular economy and represents a huge opportunity for leaders.

The Circular Economy challenge for e-waste

However, whilst the opportunity for e-waste recycling is huge - why is it that about 85 percent of e-waste today still ends up in landfill? There are currently a few clear barriers preventing progress:

- **High investment cost:** it is expensive to set up high tech recycling infrastructure, with a heavy up-front cost for companies to fund
- **Rapidly changing device technology:** As technology changes so rapidly, the recycling technology must be agile and adaptable to keep up
- **Shrinking form factors:** as technology gets smaller, there is less material than previous generations of computing
- **Low-value materials:** With secondary reuse markets receiving the high value items, recyclers receive low value or low-quality materials, limiting resale costs

The Need for leadership

With so many concurrent challenges facing the industry, it's not just recycling companies that must step up. Electronics manufacturers like Dell must also be accountable and provide solutions. Optical sensors, machines for plastics and metal separation and better labeling are all examples of how technology is bringing structure, scale and innovation to the recycling industry.

Our takeback programs are designed to make the recycling process easy for customers. We have the largest e-waste recycling program in the world with services in 83 countries and territories. Home users can recycle for free by mailing back or trading in their old Dell equipment. And, via the Dell Reconnect Partnership with Goodwill®, home users in North America can drop off any brand of electronics in any condition – working or not – for free recycling at more than 2,000 participating Goodwill locations.

Working with our partners, Dell has developed an in-depth understanding of the recycling industry and has solutions and infrastructure in place to provide a solution for nearly every component of their products. Take a typical PC for instance. For Dell, it begins with design that makes it easy for the recyclers to identify materials and disassemble components. This helps them get more value from every machine. We also work to keep materials in circulation: our "closed-loop" programs, for instance, return the plastic recovered from an old computer back into new parts for new computers within 6 months. And with other materials, our partners' innovative approaches ensure that the most materials are separated and kept in the economy. For example, recycling LCD panels involves separation of the glass substrate, polarizer foils, and the elements indium and copper into individual outputs. The liquid crystals are removed by dissolving in a solution, assisted by ultrasonic irradiation while recovery of the polarizer and glass is carried out by mechanical rushing and gravity concentration, with other metals like indium recovered from the glass via solvents.

Accelerating change

The e-waste challenge is a global and accelerating problem. Estimates indicate that the amount of e-waste produced could increase by 500% in developing countries over the next decade and without solutions, it will continue to pile up in landfill, leaching pollution into the soil whilst wasting valuable contents and materials.

Instead, we envision a better way. Today we have both the knowledge and the technologies to enable a more circular approach. As we make that shift, we are seeing more than just positive sustainability outcomes – we are creating business value: our closed-loop efforts have saved the company more than $1 million USD. It is also spurring creative new thinking, looking at how we can use design levers to ensure even more of our products get recovered.

But it also relies on you. Find those old gadgets and get them recycled, or work with your company's IT team to clear out that warehouse of old desktops to get some value back.

However you do it, help those electronics continue to circulate and keep the circular economy moving.

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