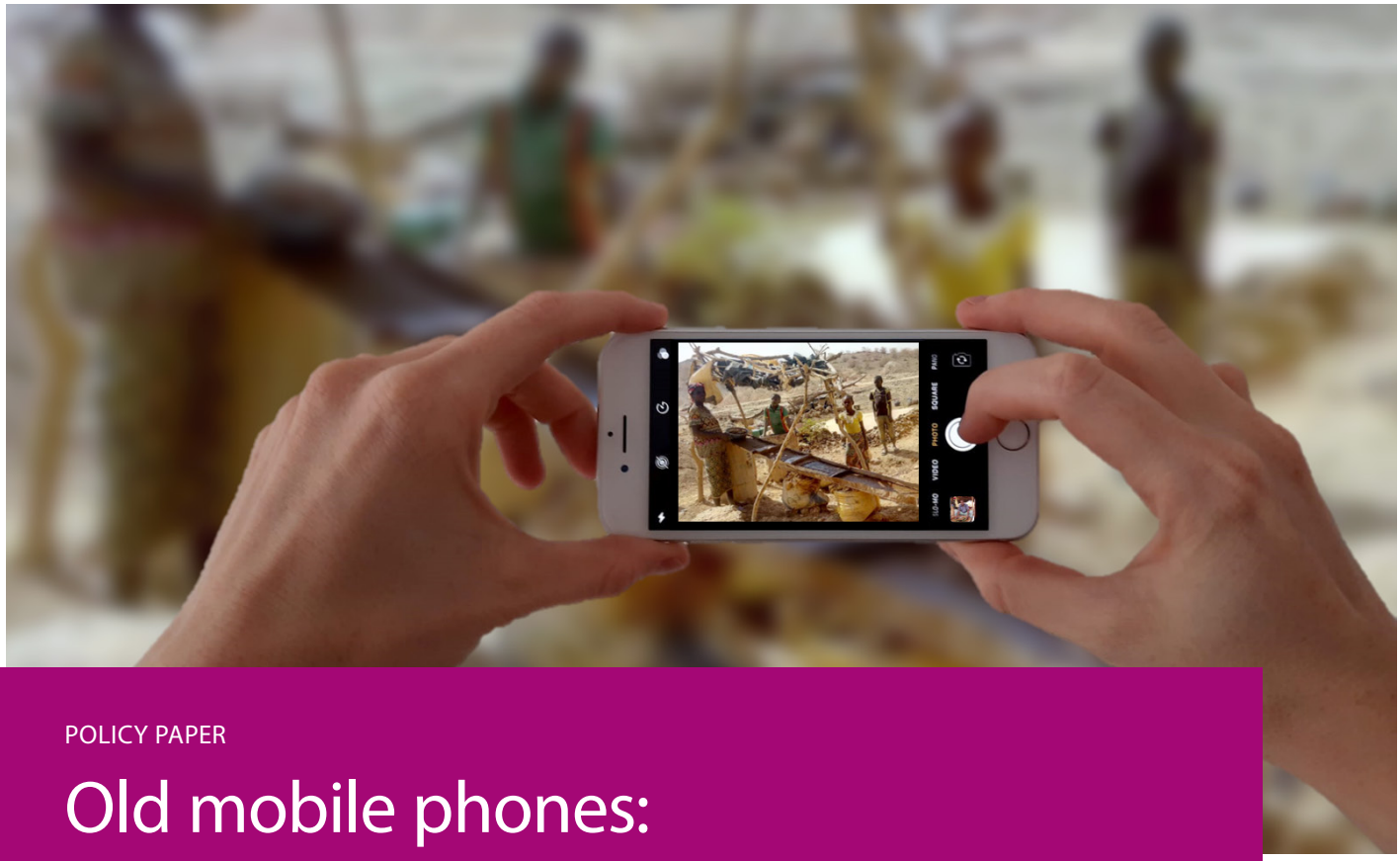

POLICY PAPER

Old mobile phones: A potential gold mine

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Summary

Mobile phones are the most commonly owned and one of the most frequently replaced personal electronic devices. Most people keep their old phone at home once they replace it. Although this might seem harmless, it withholds minerals from re-entering supply chains, which constitutes a significant lost resource. We estimate that about 6.5 million unused phones are laying around in drawers in Switzerland. Return rates of old devices for recycling remain low, despite most people saying they know where to recycle their old phones. The sale of second-hand devices also is low, even though more than half of people state that they are willing to sell their old devices for as little as CHF 5. Most people do not really know why they keep their old phones. We recommend that awareness campaigns should not only emphasise the environmental impact of e-waste but also the harm of keeping "retired" phones at home.

Precious Metals in Your Mobile

We all rely on our smartphone to communicate, navigate, connect, organise and much more. Today, there are more mobile phones subscriptions in the world than people (World Bank 2019). Metals, mined all over the world, are the secret ingredient that enable phones to deliver these amazing capabilities: tungsten allows your phone to vibrate, cobalt and rare earth elements give your phone its crisp sound, indium is to thank for your touch screen and gold helps to power the entire system. The demand for these metals is growing along with steadily rising mobile phone use across the globe.

The metals used in phones are mostly from primary sources as opposed to recycled metals, and are mined mainly by large companies. Although these companies stimulate economic growth, they are not always sufficiently regulated by local governments, and can negatively affect the surrounding environments and communities (Bell & Donnelly 2006). Artisanal and

small-scale miners, a majority of which operate illegally, also extract many of the minerals. These illegally mined minerals find their way into global supply chains, eventually ending up in various products, including phones. Although informal mining creates a livelihood for millions of people, it is also associated with financing conflict, child labour, dangerous working conditions, deforestation and harmful pollutants (IGF 2017).

The environmental cost of extracting minerals from old mobile phones is significantly less than extracting the same amount of minerals from virgin ore (Zeng et al 2018). Unfortunately, despite many people stating that they are in favour of recycling, low return rates of have limited the recycling impact of minerals in old mobile phones.

Millions of phones in Swiss drawers

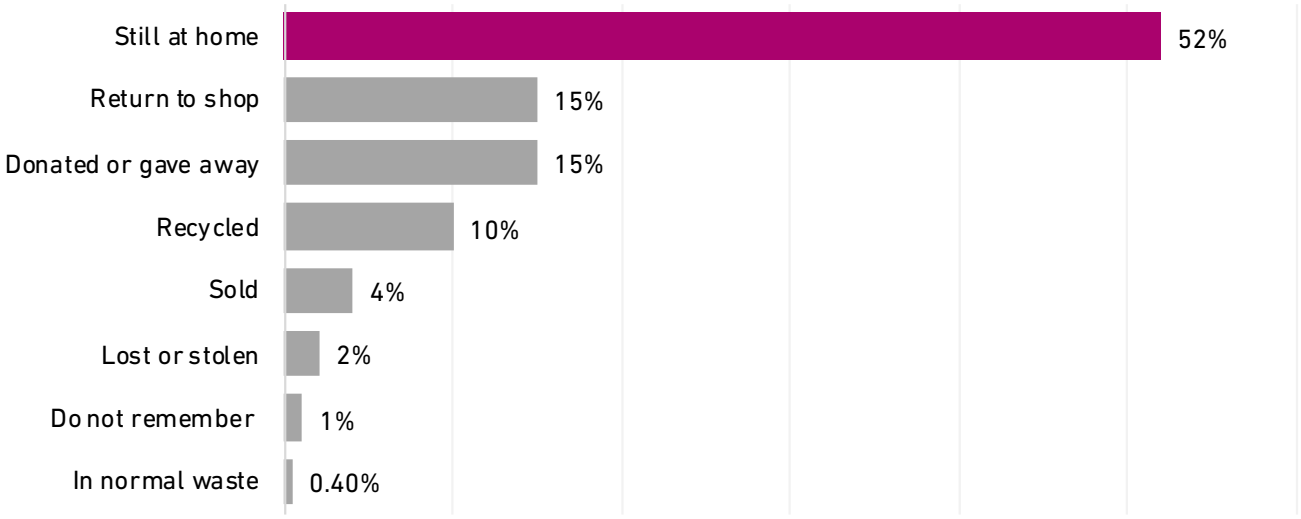
The Development Economics Group ETH conducted a large-scale survey on a representative sample of 2500 Swiss citizens to better understand blockages to sourcing metals from old phones. Phones are one of the most frequently replaced personal electronic devices. According to our study, more than 70% of phones currently in use in Switzerland were purchased in the last two years, and only 5% of mobile phones used are more than five years old. Why do people replace their phone? About 25% of participants said that the phone broke and was not repairable and 14% of participant's phone broke but they did not attempt any repairs. However, 60% replace their phone even if it is still working: about 20% of respondents replace working mobile phones because they would like a new or better phone. Eight percent of our sample said they replaced their phone because they received a new phone with their contract, a further 8% received a new phone as a gift. About 16% said their old device was not compatible with software upgrades and 8% said their phone was too slow.

Fortunately, we find that less than 0.5% of retired mobile phones in Switzerland end up in the municipal waste, which could contribute to the fastest growing streams of waste, e-waste. E-waste is a hazardous waste item that contains heavy and toxic metals, such as lead, mercury and copper. However, only 25% of respondents recycled their old phone or gave it back to their service provider. An additional 20% of people donated or sold their phone. Most commonly, users store retired mobile phones at home (see Fig. 1). Although this might seem harmless, it withholds minerals from re-entering supply chains, which constitutes a significant lost resource. We estimate that about 6.5 million old mobile phones are laying around in Swiss drawers.

"Although keeping your old phone at home might seem harmless, it withholds minerals from re-entering supply chains, which constitutes a significant lost resource."

Not knowing where to recycle old devices should not be a significant blockage, as almost 90% of respondents said that they know where to recycle an old mobile phone or could easily find out. Less than 8% of respondents did not recycle their old devices out of concerns for their data. Although more than half of participants said they are willing to sell their phone for as little as CHF 5 or less, only about 4% sold their previous phones. Some respondents still actively use their retired mobile phones, for example, using it for a second SIM card. A fifth of respondents did not know why they keep their old phones, indicating large potential to increase recycling. Moreover, although two out of five people reported that they keep the old mobile phone as a replacement, most people were unsure if their retired phone still works.

Fig. 1: What did you do with your previous phone?



What to do?

In Switzerland the real environmental impact of retired mobile phones is not that phones are hazardously discarded into the municipal waste, but that unused mobile phones are stored, withholding the minerals from re-entering supply chains. This constitutes a substantial lost resource—literally a gold mine. People might underestimate the negative impact of not recycling obsolete devices. The environmental impact of the mobile phone industry can be reduced if awareness campaigns focus on the harm of keeping old phones at home —especially since many people do not have any particular reason for keeping their old phone.

The survey evidence points to other potential changes to reduce the environmental footprint of mobile phones. Many people replace old phones because they broke, indicating potential to invest in refurbishment services to prolong the service life of phones. Additionally, we need to focus on designing phones that are compatible with software upgrades for longer, since a substantial share of people replaced their phones due to software incompatibility issues.

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Photos

p.1: Original picture by Hermann Moussa

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