

MOBILE PHONE, A SUSTAINABLE PRODUCT?

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- Booming economy
- Growth in developing markets
- Very useful services



Contribute to sustainable development ????

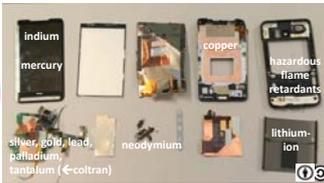
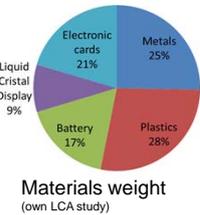
Mobile telephony, a player in economic development

	Developed countries	Developing countries	Sources
Mobile-cellular penetration rates	128 % (126% in Europe)	89 % (only 63% in Africa but mobile > fixed line household penetration)	ITU, 2013 GSMA, 2013
Growth	Europe (EEA) = rising smartphone penetration	Sub-Saharan Africa (SSA) = maximum growth in the number of users 4% of GDP	GSMA, 2011 GSMA, 2014 Deloitte, 2012
Operators activity	1% of GDP 1.7 million FTEs jobs (EEA, 2010)	3.5 million FTEs jobs (SSA, 2011)	
Price of an entry-level mobile -broadband	~1-2% of monthly GNI p.c.	~11-25% of monthly GNI p.c. (but ~19% for fixed broadband services)	ITU, 2013

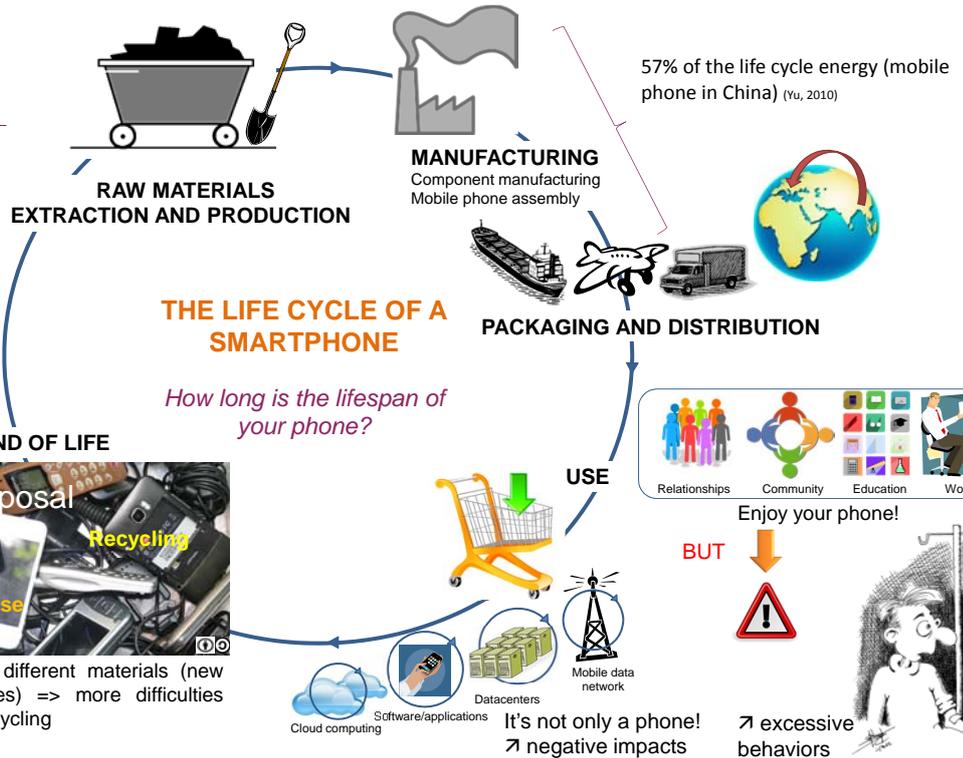
Luwero Coltan mine near Rubaya, North Kivu, Manuscro Photo - 2014



Conditions at artisanal mining sites are poor and extremely dangerous (Amnesty International, 2013 ; Etelge, 2013)



- Critical resources (availability, geopolitics)
- Over sixty metals
- Hazardous substances



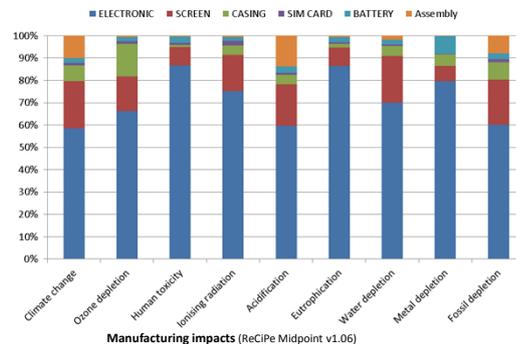
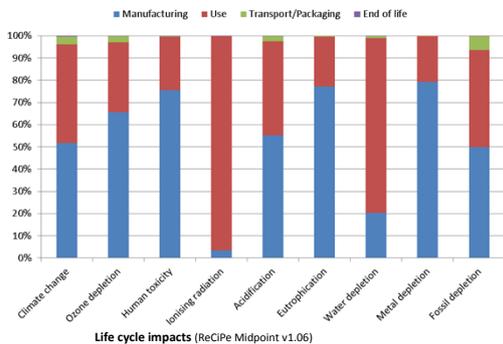
La Abuela China que cambia arroz por chicharrón. ANNA - 2009



E-waste exported in certain countries can be treated in a precarious informal context (Bisschop, 2012; Panambunan-Ferse, 2013)

ERIC DREZET (EcolInfo), 2012

LCA of a 3G smartphone Functional unit: calling and browsing the web that requires a daily load over 2 years.



Manufacturing	China (Yu, 2010) / includes material extraction
Transport	China -> France by boat and truck
Use	<ul style="list-style-type: none"> • France, 2 years (ADEME, 2012) • load every day : 2.745kWh / year (own measures, Malmmodin 2014) • network : 23kWh / user / year (Malmmodin 2014) • French electricity mix
End of Life	81% storage, 19% WEEE FRANCE (TNS Sofres, 2010)



French electricity = nuclear
If European electricity, use > manufacturing (~65% vs 35%)

So, could you change your social behavior to increase sustainability ?

- Increase the lifespan of your phone (> than 5 years).
- A new life for your old phone : give, donate, resell, recycle properly (take-back program, drop off at an electronic recycling location).
- Choose an eco-designed phone.

Write here your suggestions:

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This object which was initially a basic mobile phone, and is nowadays a smartphone with always new features, is at the basis of one of the technologies that have most changed our daily life since the 90s. With a booming economy, a clear contribution to the growth in developing markets and undeniably useful services, can we consider that it contributes to sustainable development? Our poster will first introduce the economic development related to mobile technology, then the reasons why social contributions are underestimated, and finally how this market based on obsolescence contributes to environmental damage. We will use the concept of product life cycle by considering the activities that are involved in the manufacture, the use and the disposal of mobile phones.

- Mobile telephony, a player in economic development

GSMA which represents the interests of mobile operators worldwide, reports at the end of 2013 3.4 billion unique subscribers (more than threefold compared to 2003) and 6.9 billion SIM connections. Mobile ecosystems directly contributed to around 1.3 % of the global GDP in 2013 (GSMA, 2014). However, market characteristics are very different, depending on the regions. Mobile-cell penetration rates stand at 128 % in developed countries (126 % in Europe) and at 89 % in developing countries with only 63 % in Africa (ITU, 2013), despite having displayed the fastest subscriber growth over the recent years (GSMA, 2013). The explosive growth of mobile phones in Africa and other developing countries improves productivity, increases the GDP growth and job creation (Aker, 2010). In 2011, it was estimated that mobile operators and their associated ecosystems in sub-Saharan Africa created more than 3.5 million full-time equivalent (FTE) jobs across both the formal and informal sector. They were also associated with the creation of 4.4% of the region's GDP (Deloitte, 2012).

- Social aspects, benefits and realities

The use of mobile phones is affecting several aspects of society and its positive impacts are widely highlighted: relationships and involvement in public life are made more easy, education is improved, new communities are created ... (Deloitte Access Economic, 2013) Moreover, smartphones are not just communication devices but can also take photos, play music and games, provide location-based services, maps, internet, apps. In developing countries, the main use is through oral communication and SMS to overcome the distances and the poor fixed-line networks. Mobile phones reduce population's vulnerability, especially those in rural areas or illiterate adults (Aker, 2010 ; Chudgar, 2014).

However, all these benefits only come from the use of mobiles. They should not make us forget the social issues related to manufacturing or the end of life stages. Conditions at artisanal mining sites are poor and extremely dangerous (Amnesty International, 2013 ; Elenge, 2013). E-waste generated from the use of mobiles are often exported and treated in countries such as Africa, China, Indonesia and India in a precarious informal context (Bisschop, 2012; Panambunan-Ferse, 2013). The consequences are environmental contamination and the accumulation of hazardous substances in the human body.

- Environmental impacts

In order to determine the environmental impacts of smartphones, we have performed a Life Cycle Assessment (LCA) of a third generation phone in France. The most impact categories are dominated by the manufacturing phase. For the climate change, the key processes are the energy intensive manufacturing of Printed Wiring Board (PWB) and LCD touchscreen production (80% contribution to climate change). These components also contain precious and scarce raw materials, such as silver and indium. This contributes to resource depletion. For the use phase, contributions are due to energy networks and battery loading.

Based on the results of this study, some conclusions have been drawn:

- The high turnover of mobile phones (that is the decrease of a mobile phone's lifespan) increases the impact of the manufacturing phase.
- There is not one single solution to reduce the social and environmental impact of mobile phones but several responses including recycling obsolete phones properly and eco-design.

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