



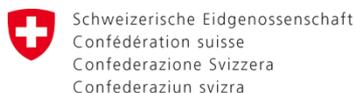
SUSTAINABLE
RECYCLING
INDUSTRIES

Impacts on climate change and contribution to circular economy of informal e-waste recycling in developing countries

Sonia Valdivia, World Resources Forum



13 May 2019, 13th Symposium on ICT, Environment and Climate Change, Geneva



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of Economic Affairs FDEA
State Secretariat for Economic Affairs SECO



Materials Science & Technology



Content

- World Resources Forum and SRI programme
- E-Waste recycling and contribution to the Circular Economy
- Challenges and opportunities to ban 'worst e-Waste practices' and reduce the carbon footprint
- Conclusion



The World Resources Forum Association (WRFA) is an independent non-profit international organization serving as a global platform. It connects and fosters knowledge exchange on resources management amongst business leaders, policy-makers, NGOs, scientists and the public. Flagship activity is the **annual WRF Conference**.

The Sustainable Recycling Industries programme builds on the success of implementing e-waste recycling systems together with various developing countries since more than



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Programme Management



EMPA

Advisory Council (CH based)

International Initiatives & Platforms

Life Cycle Inventories



Brazil, India, South Africa

Recycling Initiatives



EMPA

Colombia, Peru, Ghana, Egypt, India

SRI Roundtable



Global stakeholder process

Circular Economy

A **circular economy** is an alternative to a traditional linear **economy** (make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life.

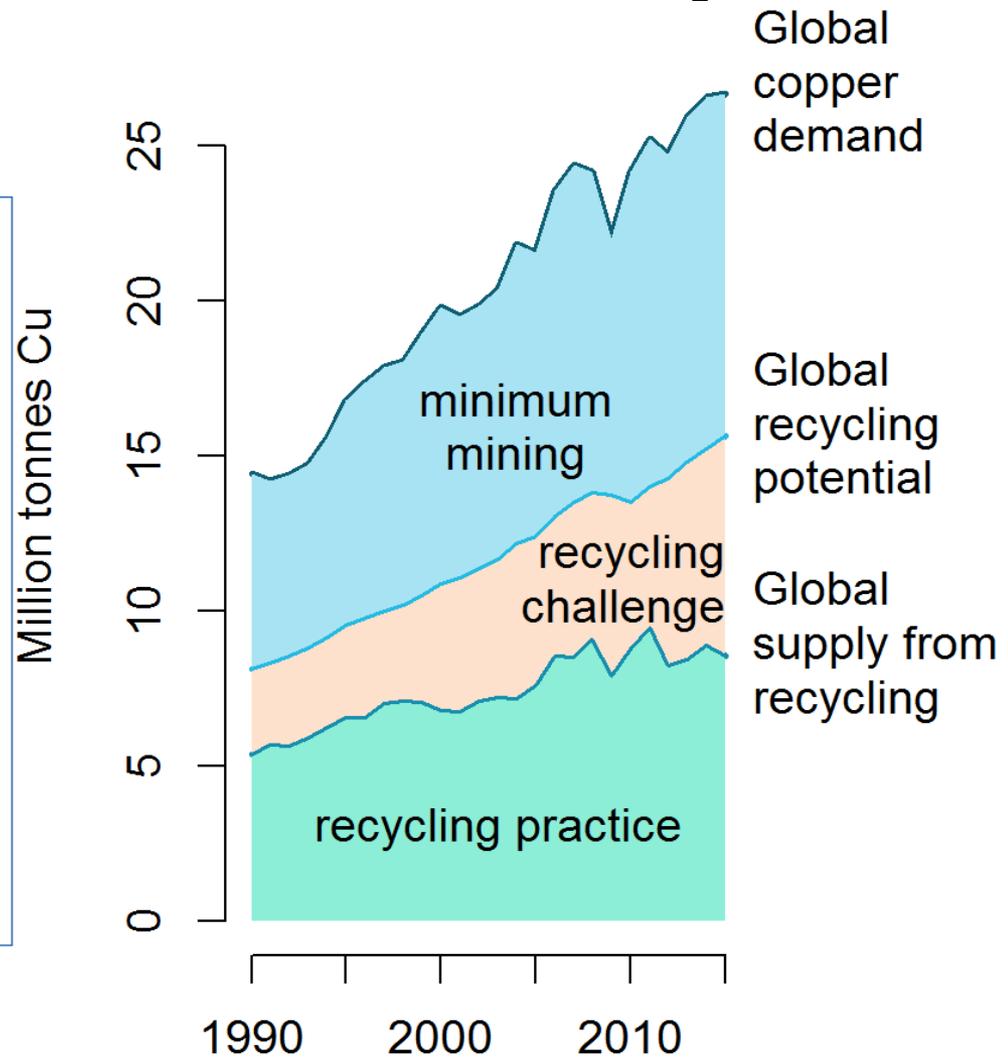
Source: WRAP

Limits and opportunities of circularity- Copper case

Approx. 1/3 of copper supply comes from recycling
Approx. 1/3 of copper supply comes from recycling
Still significant opportunities to increase recycling through better collection, dismantling and separation

Source: Luis Tercero, Fraunhofer Institut, @WRFAntwerp2019

Data updated from Glöser, Soulier & Tercero Espinoza (2013): Dynamic analysis of global copper flows. Global stocks, postconsumer material flows, recycling indicators & uncertainty evaluation. *Environmental & Technology*, **47**, 6564-6572



Impacts on climate change of copper

100%
when
mining

Recycling a ton of **copper** uses
15% of the **energy** that would
be used
to **mine** and **extract** the
same **copper**.

15%
when
recycling

Source: Resources School Science,
resources.schoolscience.co.uk/CDA/16plus/sustainability/copper3.html

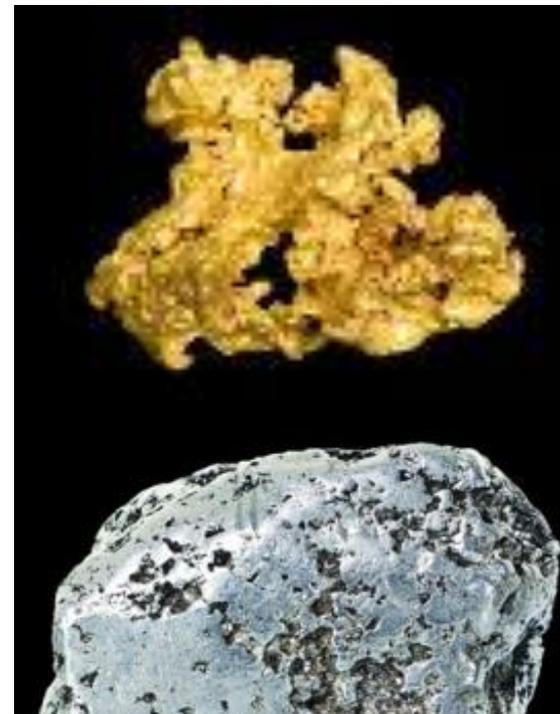
Recycling offers opportunities. In developing countries more than 90% of recovered materials is done informally.

Informality



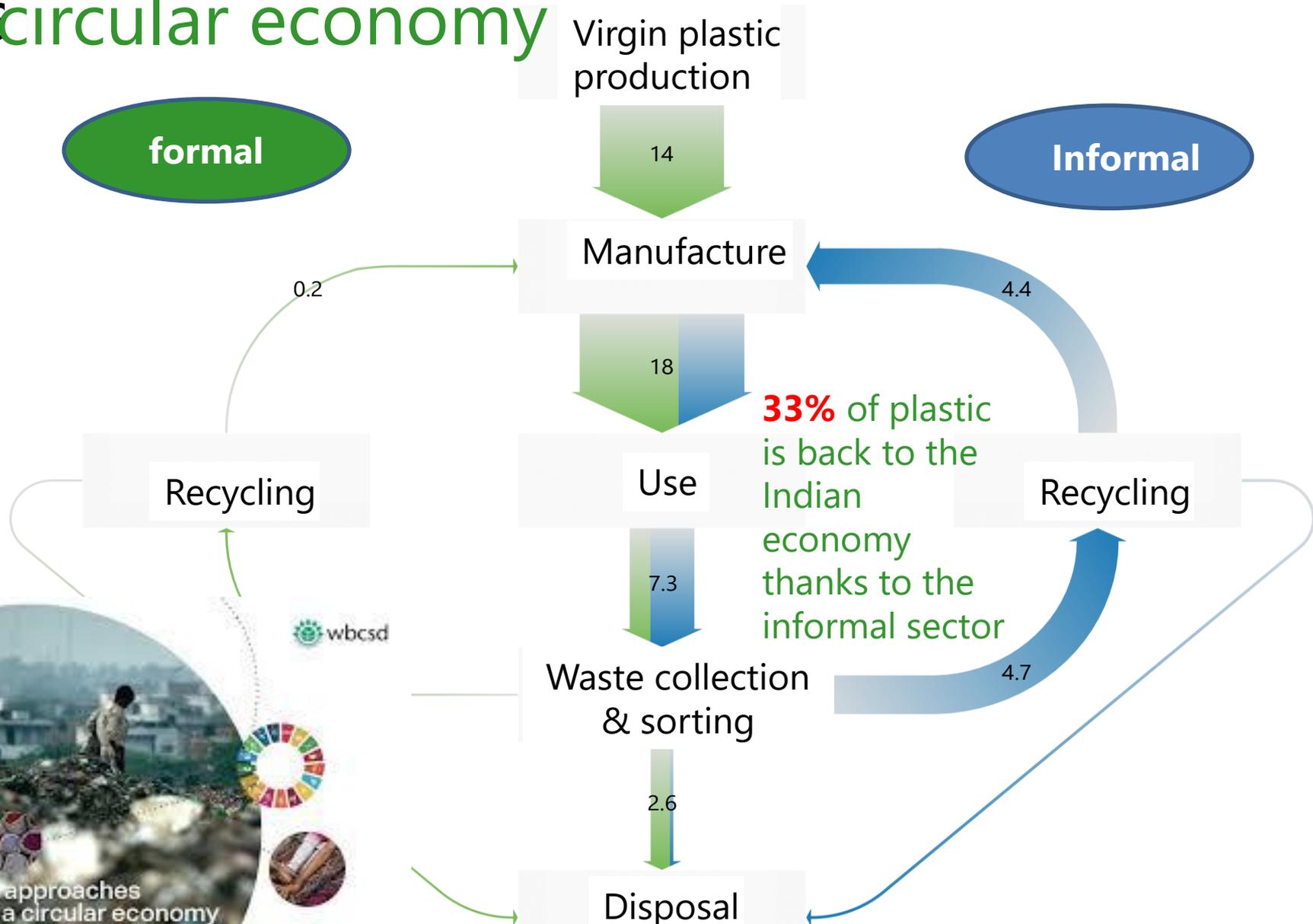
~ 25 000 people recycle plastic in New Delhi, India

Opportunities



"Urban Mining"

The informal recycling sector is the **cha** circular economy



Informal approaches towards a circular economy
 - learn with from the plastics recycling sector in India

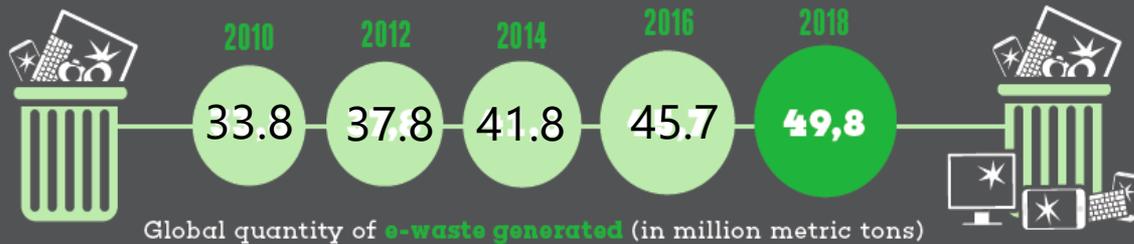


Figure: Plastic flows in India (2015). Unit: million tonnes per

The Challenge of e-waste

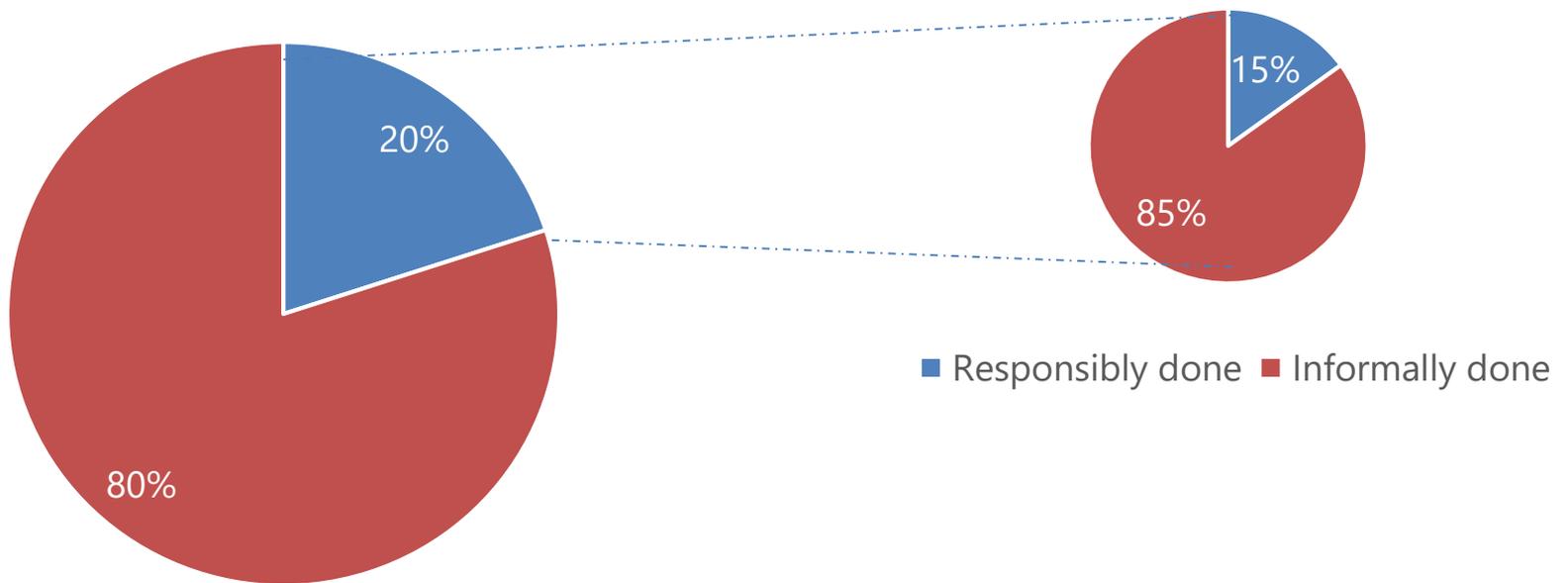
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Fastest growing waste stream in the world



\$52 bn

Estimated cost to the global economy (2014)



■ Recycled/re-used ■ Non-recycled/re-used

Source: The Global E-waste Monitor 2017, UNU

...recycling by the informal sector poses risks and threats

Threats

Child labour



Worst practices



**Environmental pollution,
health hazards, other**

SRI launched a global multi-stakeholder process to create a framework for inclusive recycling

- The ISO IWA 19 aims to guide economic operators of secondary metals value chains, including the informal sector, in the efficient and credible implementation of improved recycling practices, in particular in emerging and developing economies.

INTERNATIONAL
WORKSHOP
AGREEMENT

**IWA
19**

First edition
2017-04

**Guidance principles for the sustainable
management of secondary metals**

*Principes directeurs pour la gestion durable des métaux de seconde
fusion*



Reference number
IWA 19:2017(E)

© ISO 2017

- This supports the implementation of The ISO IWA 19 and to move away from Worst Practices



From Worst to Good Practices in Secondary Metals Recovery

FACT SHEETS

SRI SUSTAINABLE
RECYCLING
INDUSTRIES

Life cycle
assessment:
Provides a
baseline for
improvement



**660 kg CO₂ per
fridge
unproperly
dismantles**



**1.60 kg CO₂
per copper-
cable openly
off-burnt**

CO₂ baseline example: South Africa
with 11 Mio cooling appliances

**If these are replaced every
12 years, and 20% are
recycled – out of which
85% is done improperly-,
then ≈ 100,000 tons CO₂
per year are
produced...but can be
saved!**

Through inclusive and sustainable recycling, millions of tonnes of CO2 worldwide can be saved, safe jobs can be created and resource efficiency improved...hence, more circularity



THANK YOU!
Sonia Valdivia



Tales of Trash / Relatos de
Residuos
5 Principles for Inclusive
Recycling

sustainable-recycling.org // info@wrforum.org