2018

Repair = care: system stories from Norway and Ghana

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REPAIR = CARE

Systems stories from Norway and Ghana

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Overview

- Circular economy
  - Re-use, Refurbish, Repair, Recycle

- Systems stories of informal repair in Norway and Ghana
  - Community repair in Oslo, Norway
  - Informal repair in Accra, Ghana
  - *Repairing broken smartphone screens*

- Repair = Care
  - A systemic design intervention
  - Mending broken worlds?
  - A doings of care

SMART
Sustainable Market Actors for Responsible Trade

We study the barriers and drivers for market actors' contribution to the UN Sustainable Development Goals within planetary boundaries, with the aim of achieving Policy Coherence for Development.

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Sustainability: **Securing the social foundation for people everywhere now and in the future, while staying within planetary boundaries**

Mobile phone life cycle: **Life threatening** impacts, especially in the resource extraction, manufacturing, and end-of-life phases (hotspots)

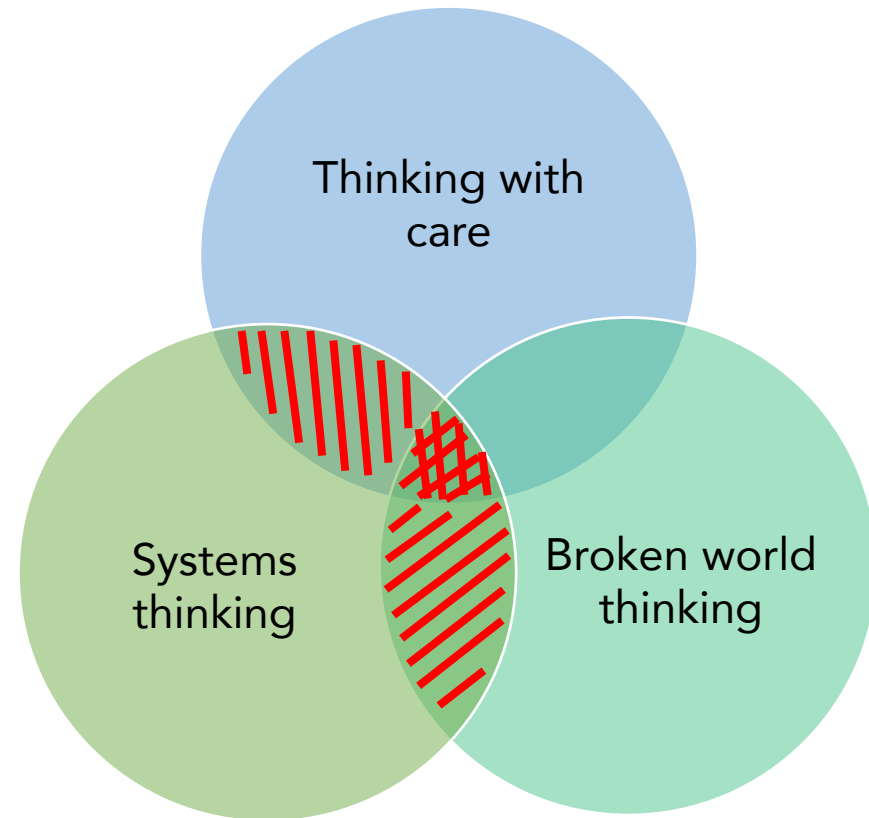# Epistemological and methodological positioning

Main influences:

Ray Ison (2017): Systems Practice: How to Act - In Situations of Uncertainty and Complexity in a Climate-Change World (2nd ed.)

Steve Jackson (2014): *Rethinking Repair (Broken world thinking)*

Maria Puig de la Bellacasa (2011): *Matters of care in technoscience: Assembling neglected things*

OUTLINE OF A CIRCULAR ECONOMY
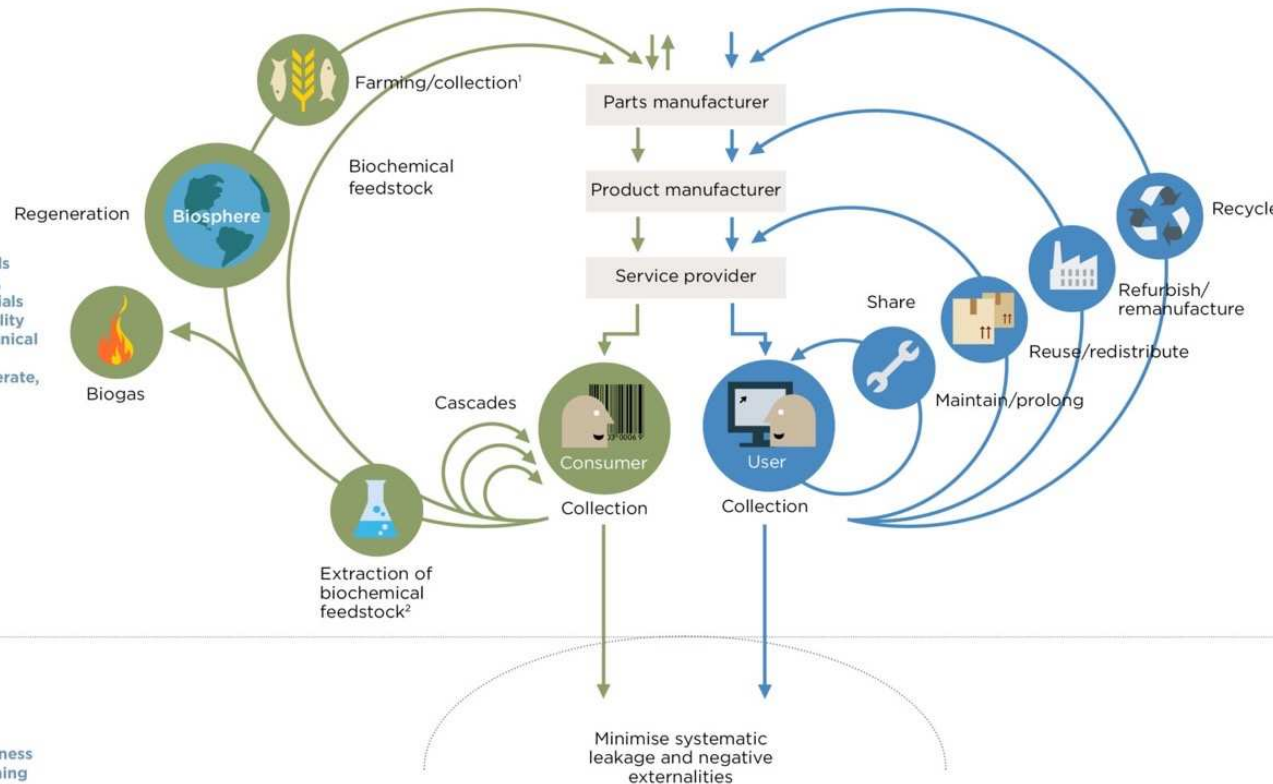
PRINCIPLE

1

Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows
ReSOLVE levers: regenerate, virtualise, exchange

PRINCIPLE

2

Optimise resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles
ReSOLVE levers: regenerate, share, optimise, loop
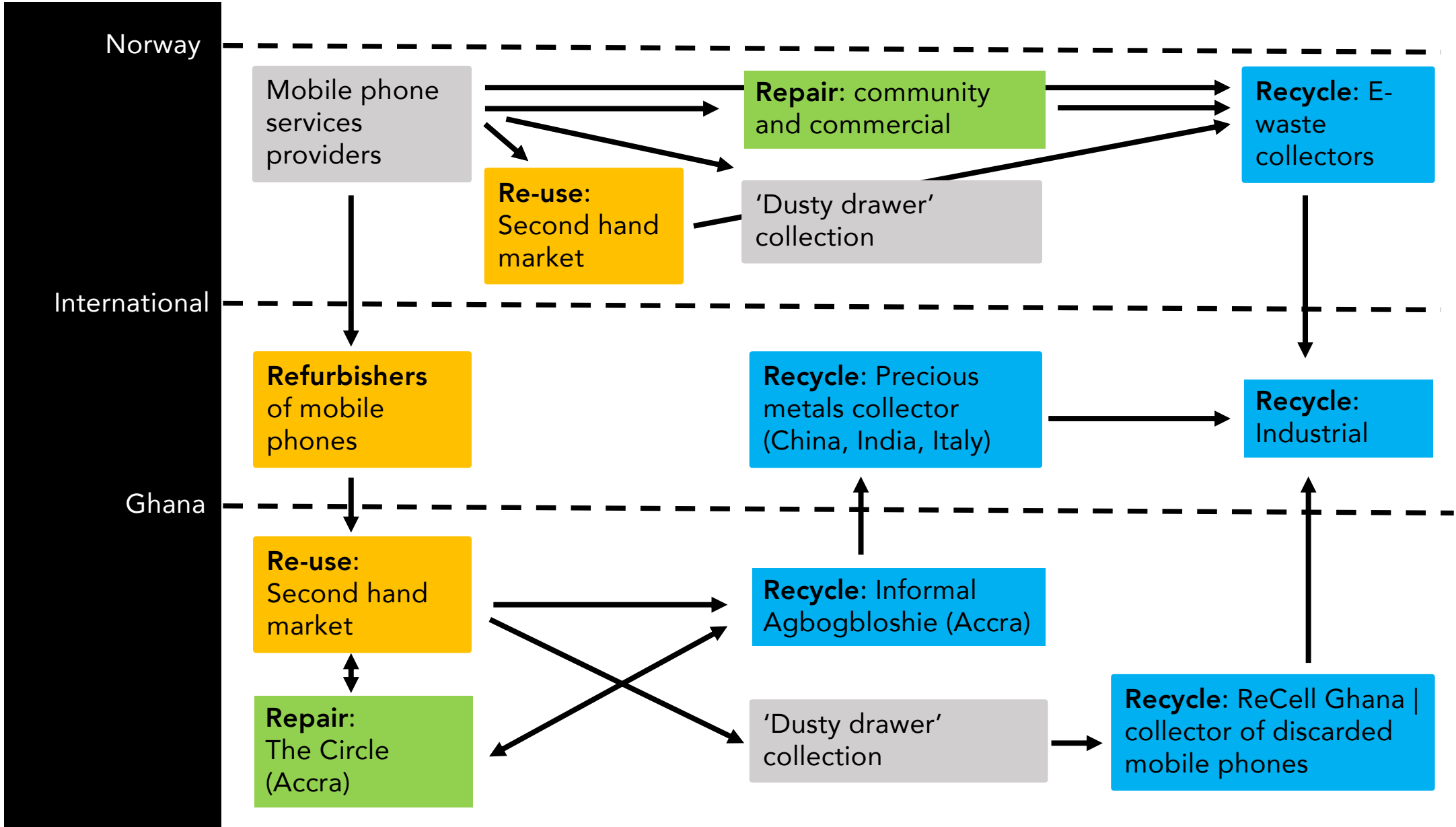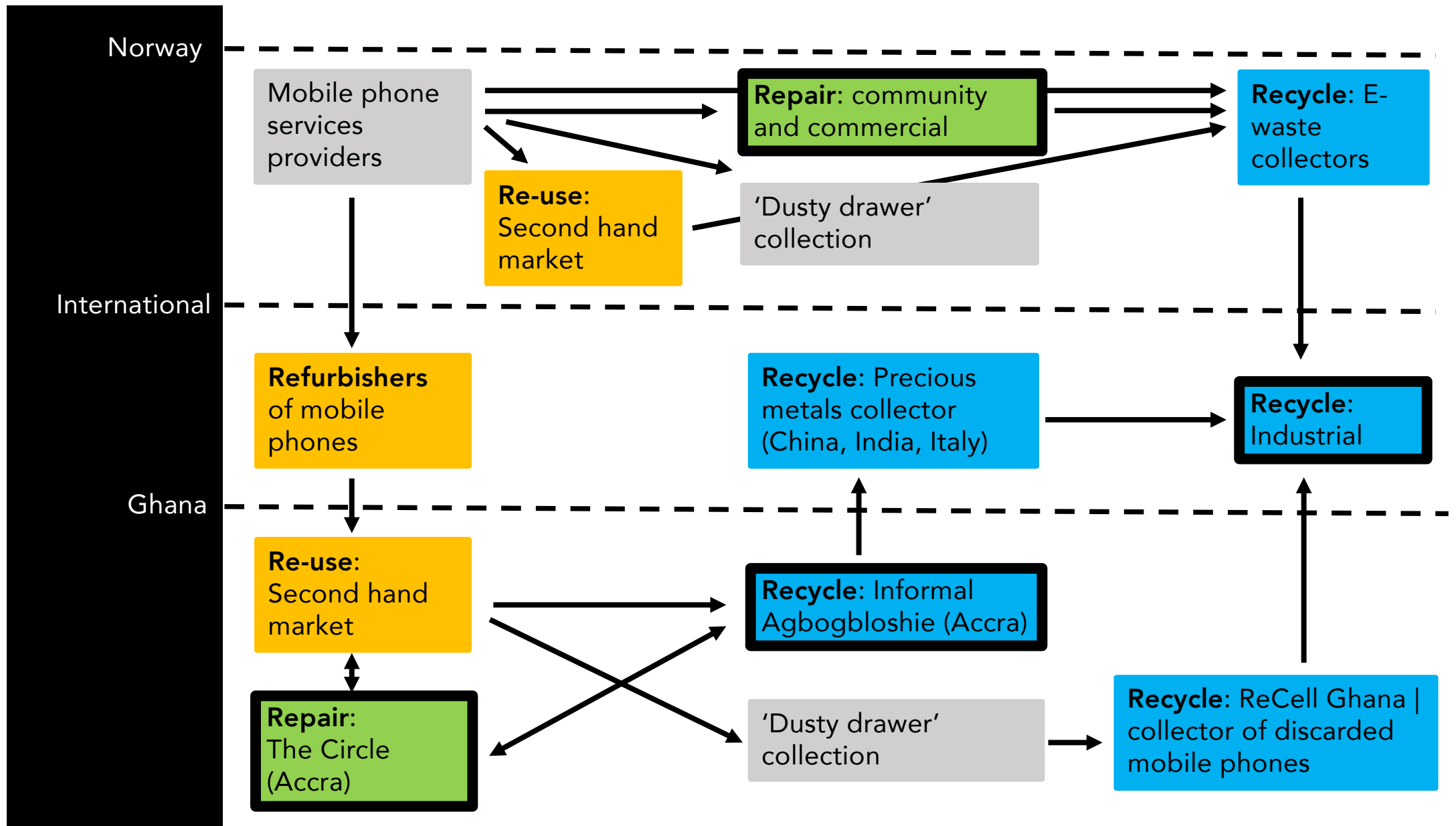
PRINCIPLE

3

Foster system effectiveness by revealing and designing out negative externalities
All ReSOLVE levers

Renewables   Finite materials

Regenerate   Substitute materials   Virtualise   Restore

Renewables flow management   Stock management

Farming/collection¹

Parts manufacturer

Biochemical feedstock

Regeneration   Biosphere

Product manufacturer

Recycle

Service provider

Share

Refurbish/remanufacture

Biogas

Reuse/redistribute

Cascades

Consumer   User

Maintain/prolong

Collection   Collection

Extraction of biochemical feedstock²

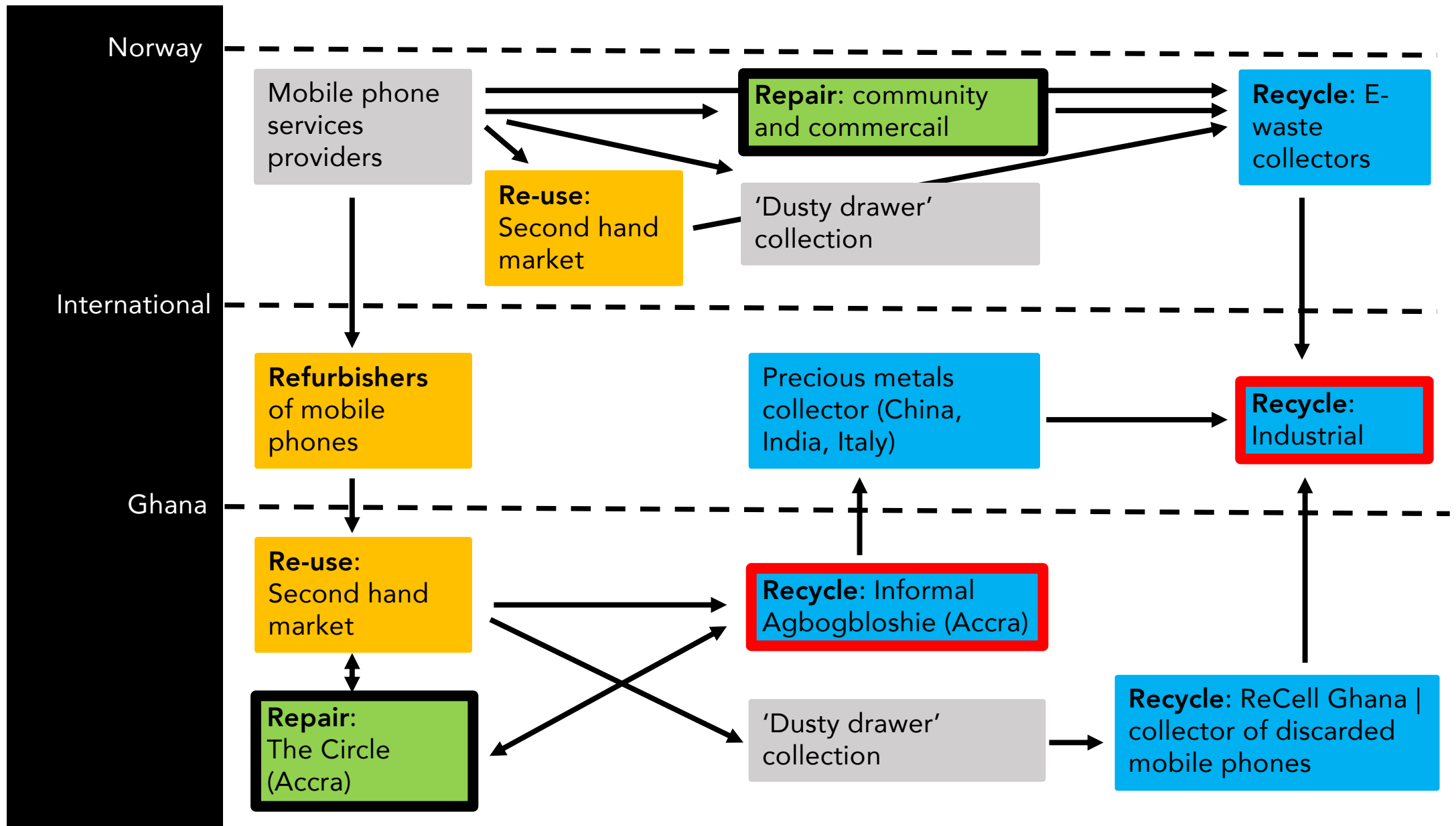Minimise systematic leakage and negative externalities

1. Hunting and fishing
2. Can take both post-harvest and post-consumer waste as an input

Source: Ellen MacArthur Foundation, SUN, and McKinsey Center for Business and Environment; Drawing from Braungart & McDonough, Cradle to Cradle (C2C).

Mobile phone life cycle in a circular economy perspective:

- Prolong the lifespan through maintenance and **repair**

- Prolong the lifespan through **re-use** (second-hand market)

- Prolong the lifespan of materials through **refurbishment** and remanufacturing

- **Recycle**

Norway

Mobile phone services providers

Repair: community and commercial

Recycle: E-waste collectors

Re-use: Second hand market

'Dusty drawer' collection

International

Refurbishers of mobile phones

Recycle: Precious metals collector (China, India, Italy)

Recycle: Industrial

Ghana

Re-use: Second hand market

Repair: The Circle (Accra)

Recycle: Informal Agbogbloshie (Accra)

'Dusty drawer' collection

Recycle: ReCell Ghana | collector of discarded mobile phones

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Recycling in Agbogbloshie
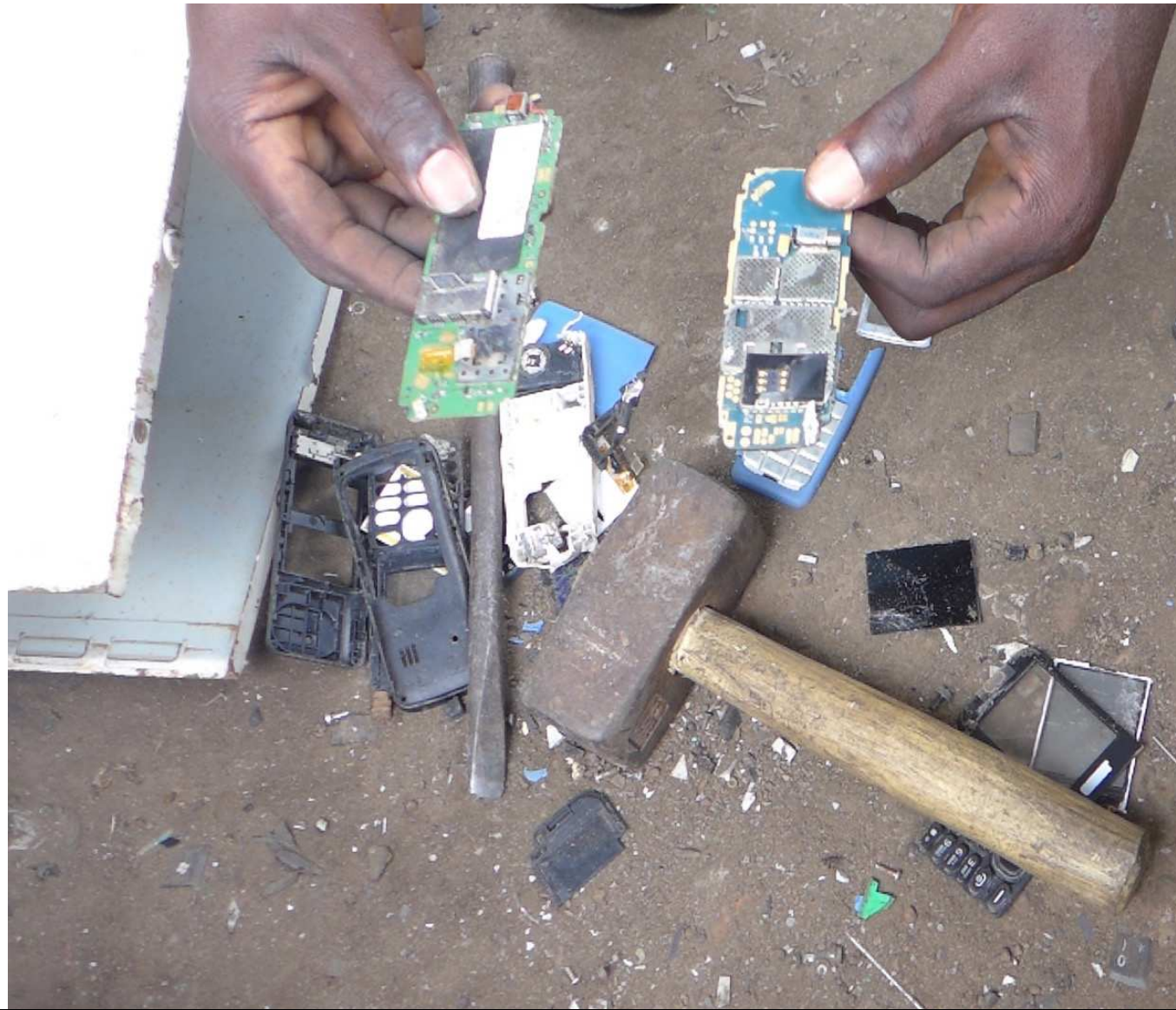
use of simple and cheap tools | cherry-picking the most valuable components

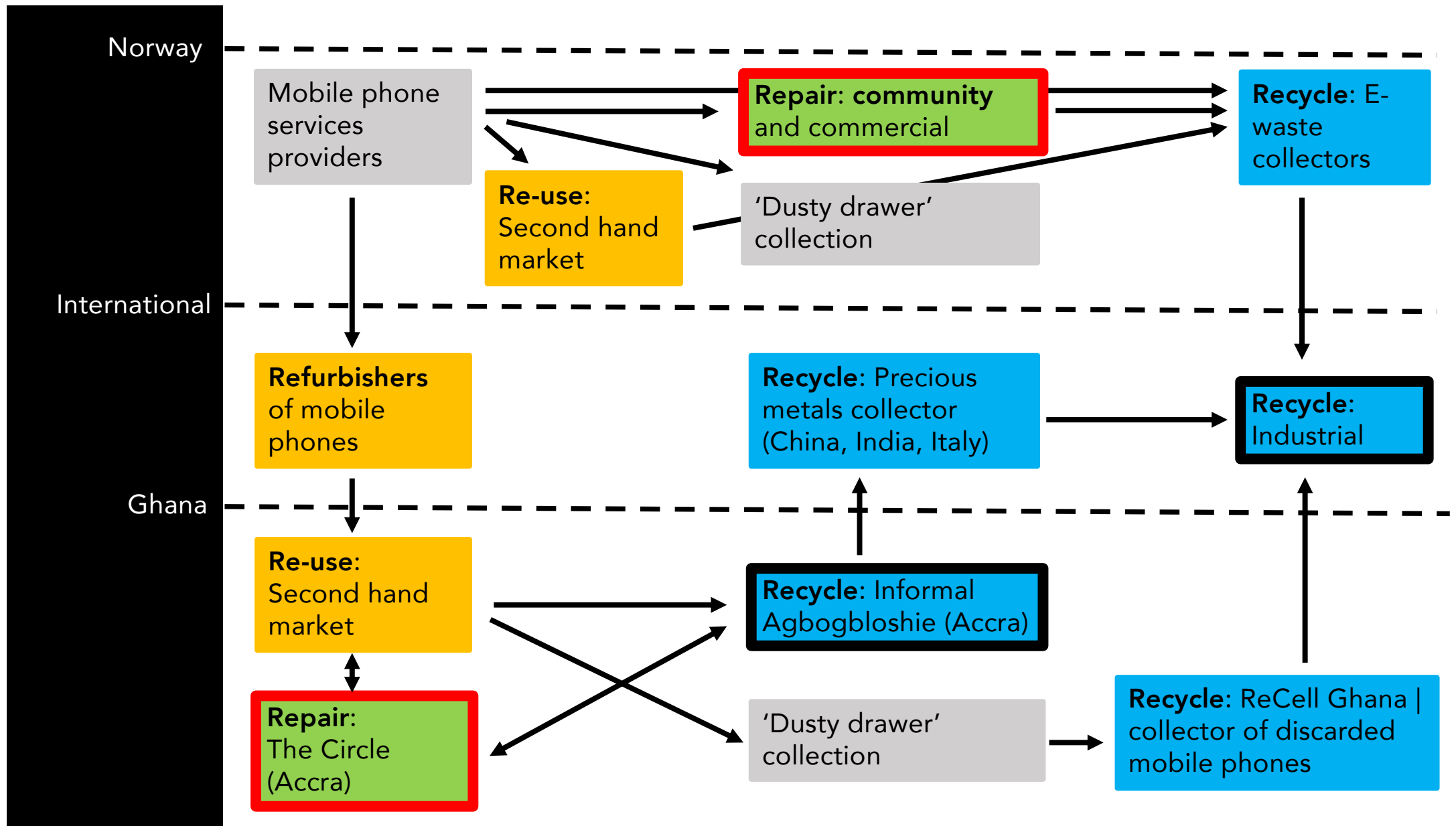Whole phone

TSL Furnace
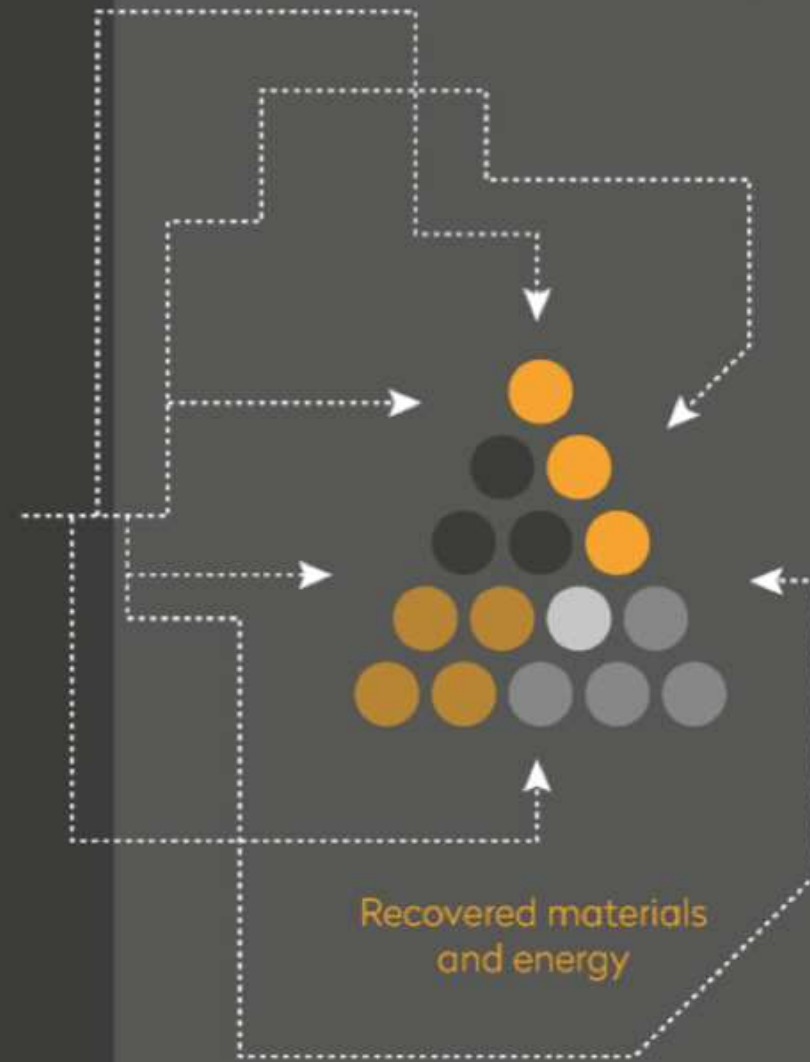
Recovered materials and energy

Photo credit: Fairphone

Recycling at Umicore | 17 metals recovered | plastic and other materials are used as fuel | slag used in building materials

Mobile phone recycling challenges

- Location
  - Many mobile phones end up in countries without e-waste management system (via second-hand market)
- Not designed for disassembling
  - Increasing use of glue
  - Special tools needed
- Informal recycling
  - Cherry picking - only valuable parts are recycled
  - Loss of energy and materials
- Industrial recycling
  - Loss of energy and materials

Norway

Mobile phone services providers → **Repair: community** and commercial → **Recycle**: E-waste collectors

Re-use: Second hand market → 'Dusty drawer' collection

International

Refurbishers of mobile phones

Recycle: Precious metals collector (China, India, Italy) → **Recycle**: Industrial

Ghana

Re-use: Second hand market → **Recycle**: Informal Agbogbloshie (Accra)

Repair: The Circle (Accra)

'Dusty drawer' collection → **Recycle**: ReCell Ghana | collector of discarded mobile phones

Repair stories as systems stories

- "Telling stories is a powerful way to make sense of our own experience and of the world around us. Stories shape our identity, communicate who we are and what is important to us, and move others to act" (Peter Stroh, 2015)

- "It matters what stories tell stories " (Donna Haraway, 2017)

- Stories from the "ruins of capitalism" (Anna Tsing, 2017)

Community repair in Norway

#	navn	hva (år)
16.	silvia	elbillader nissan (6)
17.	vetle	del av høytaler (10)
18.	remi	grafikk kort PC (257)
19.	henning	knust bakdeksel mobil HTC (1) ny
20.	oda	lader til laptop acer (3)
21.	oliver	yamaha keyboard (40)
22.	petter	samsung mobil (18 months)
23.	audun	philips lp spiller
24.	thomas	iphone 6 (35) (5) skjerm lab
25.	terje	lydkart zoom (2)
26.	håvard	bluetooth høytaler
27.	maria	sandstrøm radio
28.	håvard	CD-spiller pioneer (4) (5)

Mobile phone repair at the Circle in Accra, Ghana
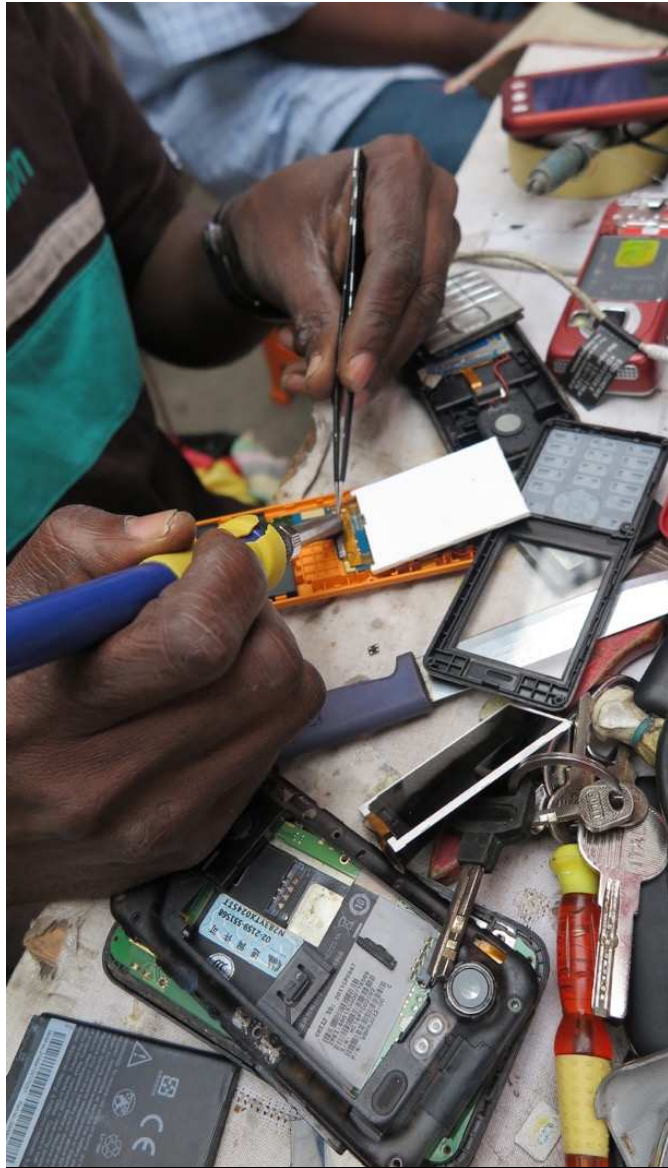
highly-skilled repairers | parts from broken phones often used as spare parts

Mobile phone repair challenges

- Costs
  - Often too expensive
  - Expensive spare parts

- Not designed for repair
  - Increasing use of glue
  - Special tools needed

- Problematic access to spare parts & manuals
  - Court cases against mobile phone repairers

- Right to repair under attack
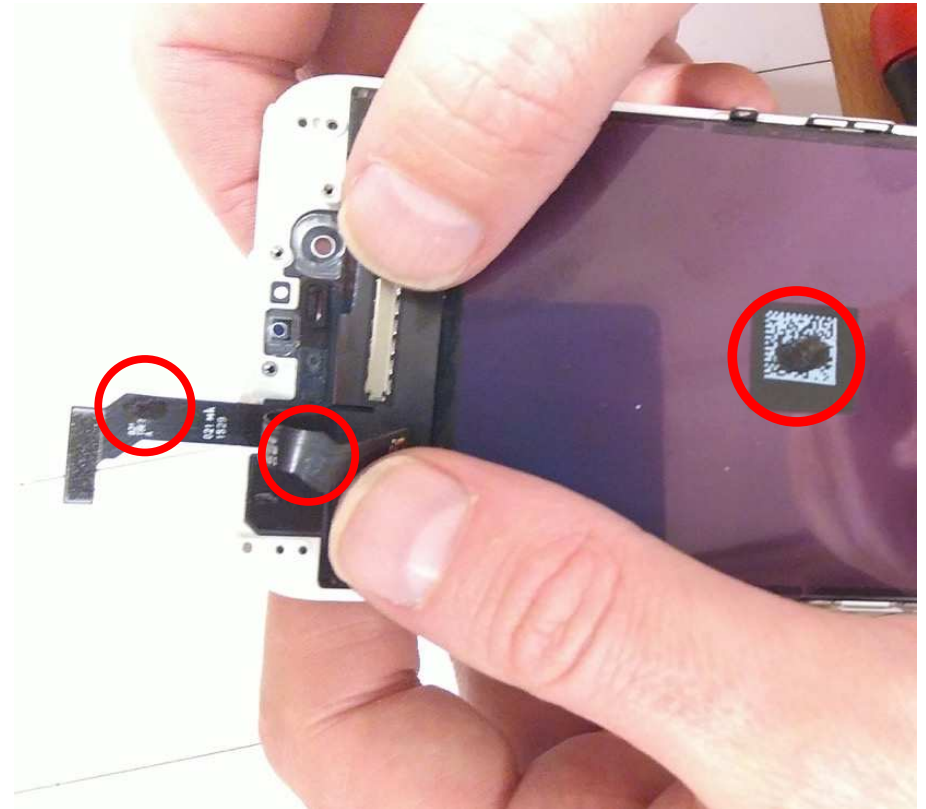 - Warranty lost when using unauthorised repairer or DIY repair

OLD   NEW
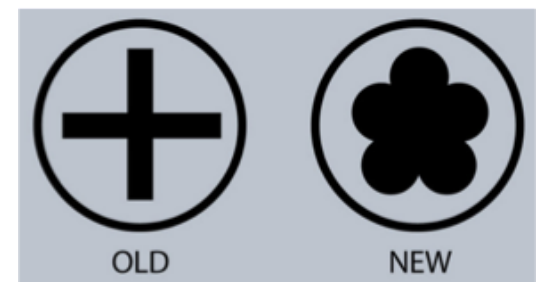
Repair = Care: Community repair

iPhone 6s: € 380

Broken screen repair:

- Apple: € 240

- Community repair: € 95 for original screen (logos blacked out) or € 45 for a copy

- Whole display unit replaced

Repair = Care: The Circle
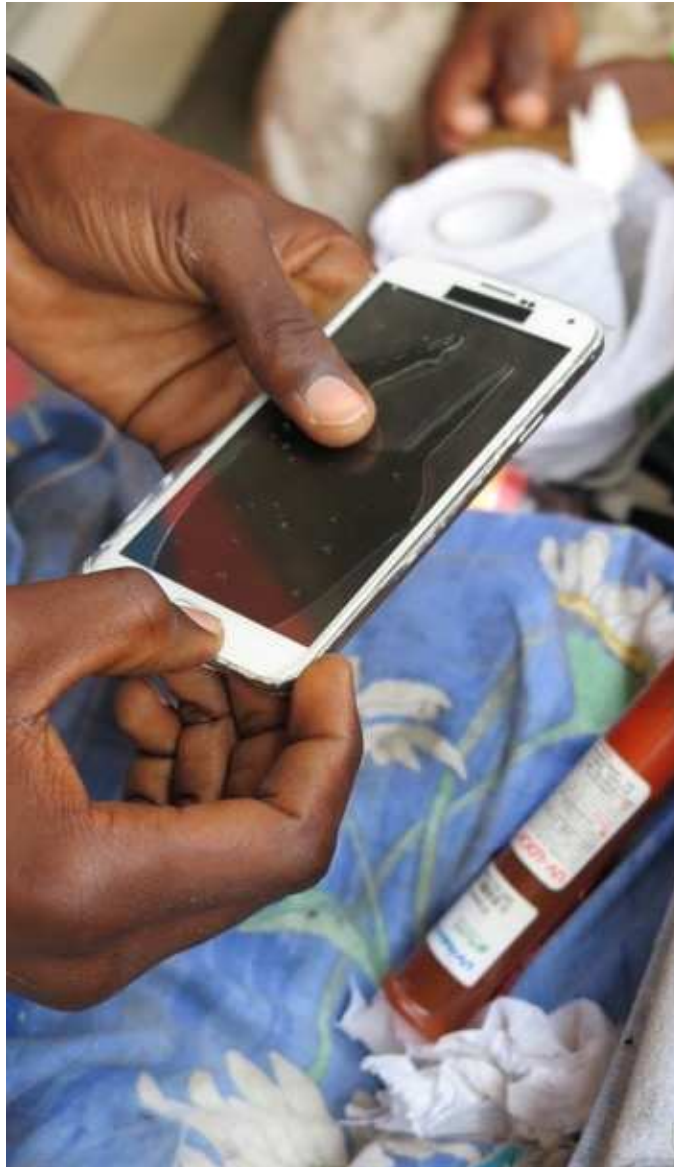

- Only broken part replaced
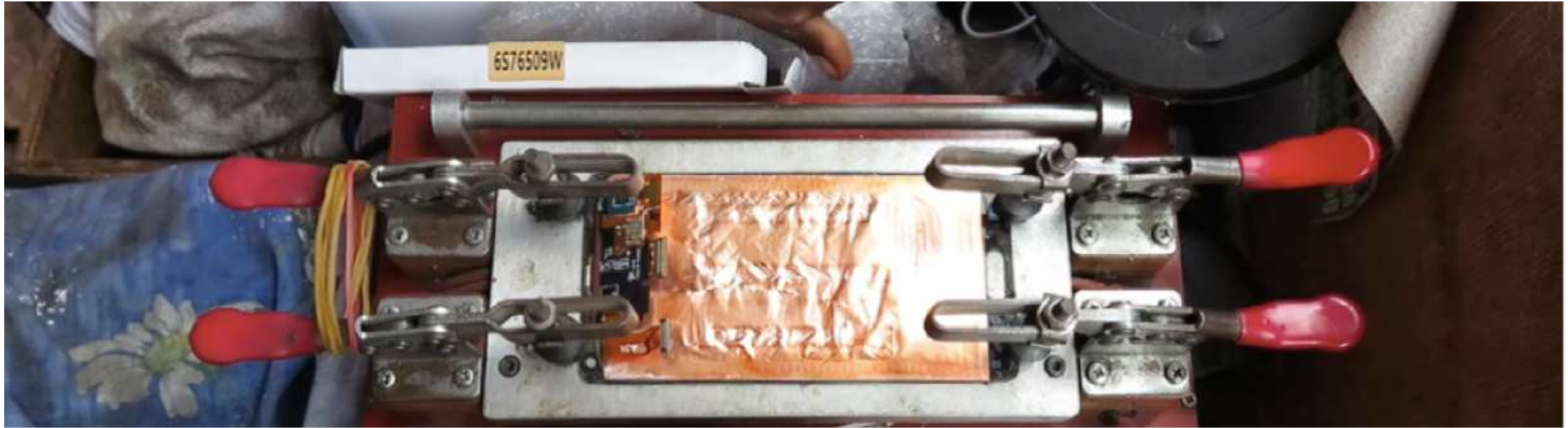
separating the broken glass from the display unit

Adding the right amount of glue to fasten the new glass

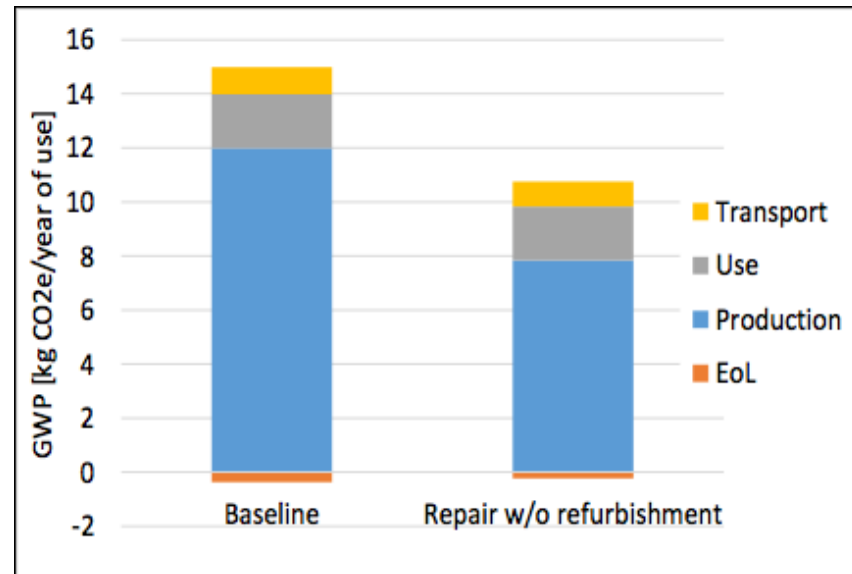testing if the display unit works | hardening the glue

Repair = Care: Fairphone

Repair = Care: Fairphone

- Extending the life span of mobile phones to 5 years

- Slowing down the circular economy

- Diminishing the environmental and social risks in the mobile phone life cycle

- Lower global warming potential (GWP)

Results per year of use - baseline and repair scenario

- Increasing the use-time by two years (5 instead of 3) decreases the yearly GHG emissions by ~ 30 %
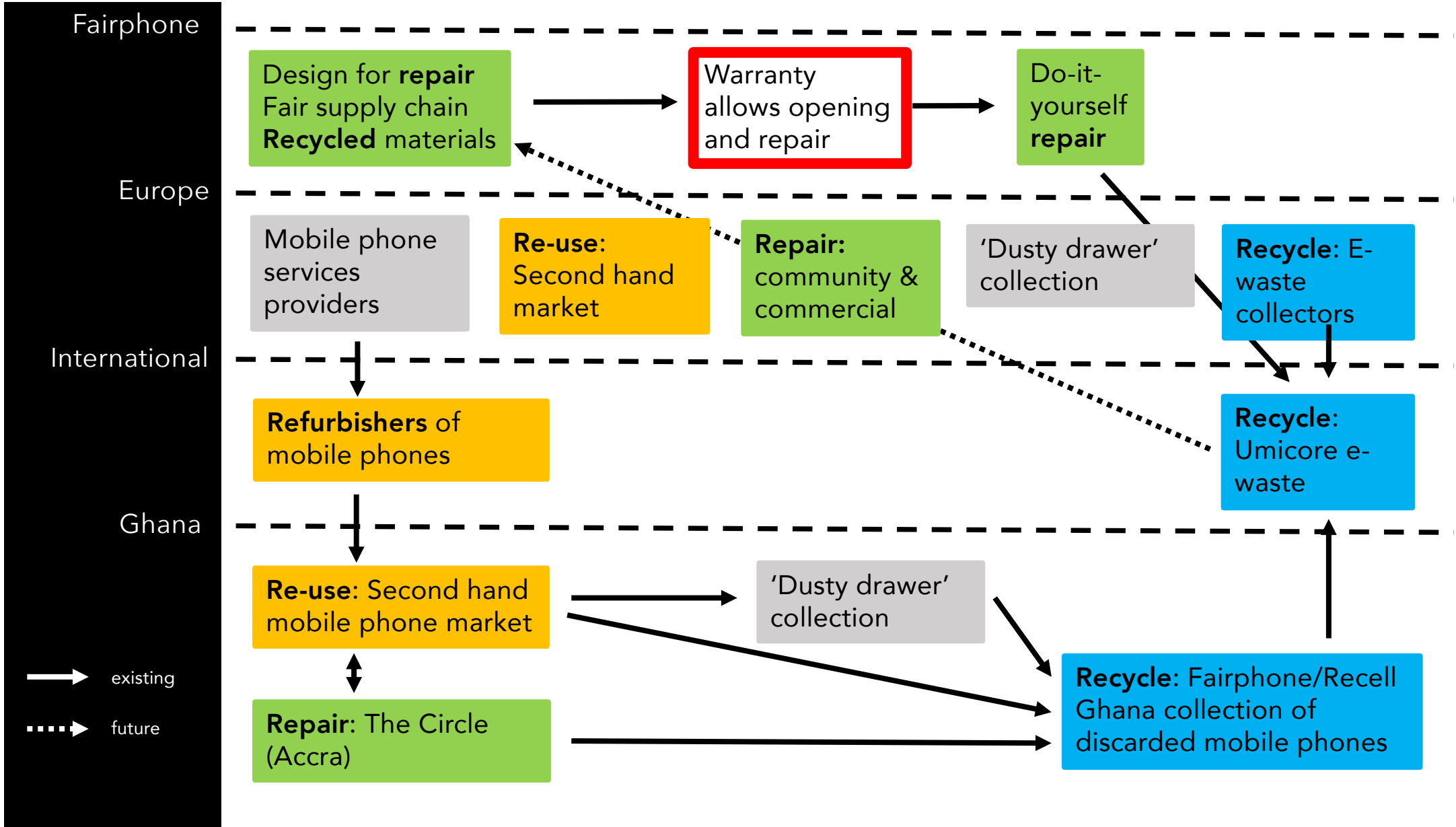
Rows (left column labels):
Fairphone
Europe
International
Ghana

Legend:
→ existing
⇢ future

Boxes:

Design for **repair** / Fair supply chain / **Recycled** materials

Warranty allows opening and repair

Do-it-yourself **repair**

Mobile phone services providers

Re-use: Second hand market

Repair: community & commercial

'Dusty drawer' collection

Recycle: E-waste collectors

Refurbishers of mobile phones

Recycle: Umicore e-waste

Re-use: Second hand mobile phone market

'Dusty drawer' collection

Repair: The Circle (Accra)

Recycle: Fairphone/Recell Ghana collection of discarded mobile phones

Repair = Care

- **Systemic design intervention** through the use of deep leverage points
(Abson et al., 2016; based on Meadows, 1999)
  - Design of the system
    - The structure of information flows
    - The rules of the system
  - Intent of the system:
    - The goal of the system
    - The mindset/paradigm out of which the system arises

- Mending **broken worlds**?
  - (More) work for repairers, but what about the scavengers and recyclers at Agbogbloshie? Train them to become disassemblers for the collectors (Bo2W approach) and/or repairers?

- Doings of **care**
  - «... more than the responsible maintenance of technology» (de la Bellacasa, 2011)
  - Paying attention/giving voice to marginalised issues, such as informal work
  - Care can be transitional and potentially transformative

Photo caption:

Fairphone designer Miquel Ballester discusses the repairability of Fairphone modules with repairers in Ghana

Thank you