LEUPHANA
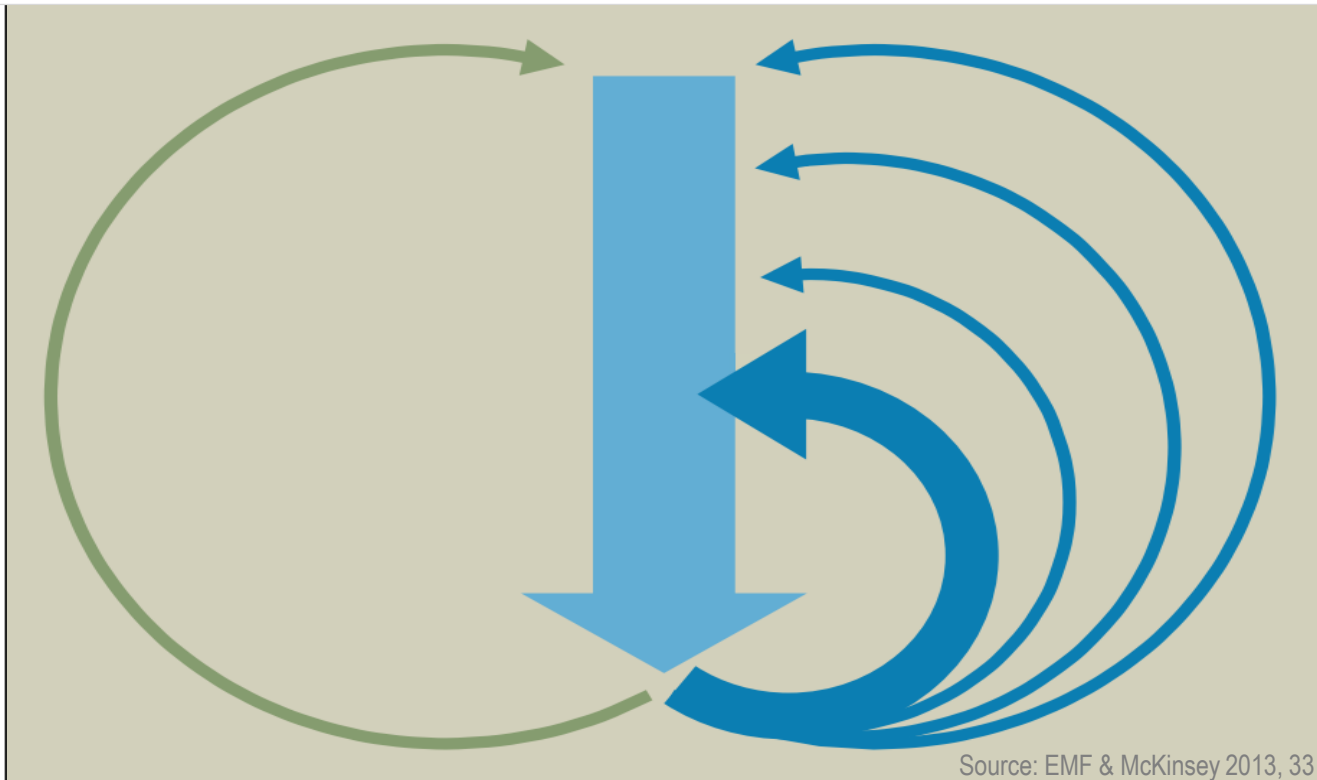UNIVERSITÄT LÜNEBURG

Source: EMF & McKinsey 2013, 33

CLOSING LOOPS IN
THE CIRCULAR ECONOMY 05.12.2016

Innovationsverbund Nachhaltige Smartphones, Lüneburg
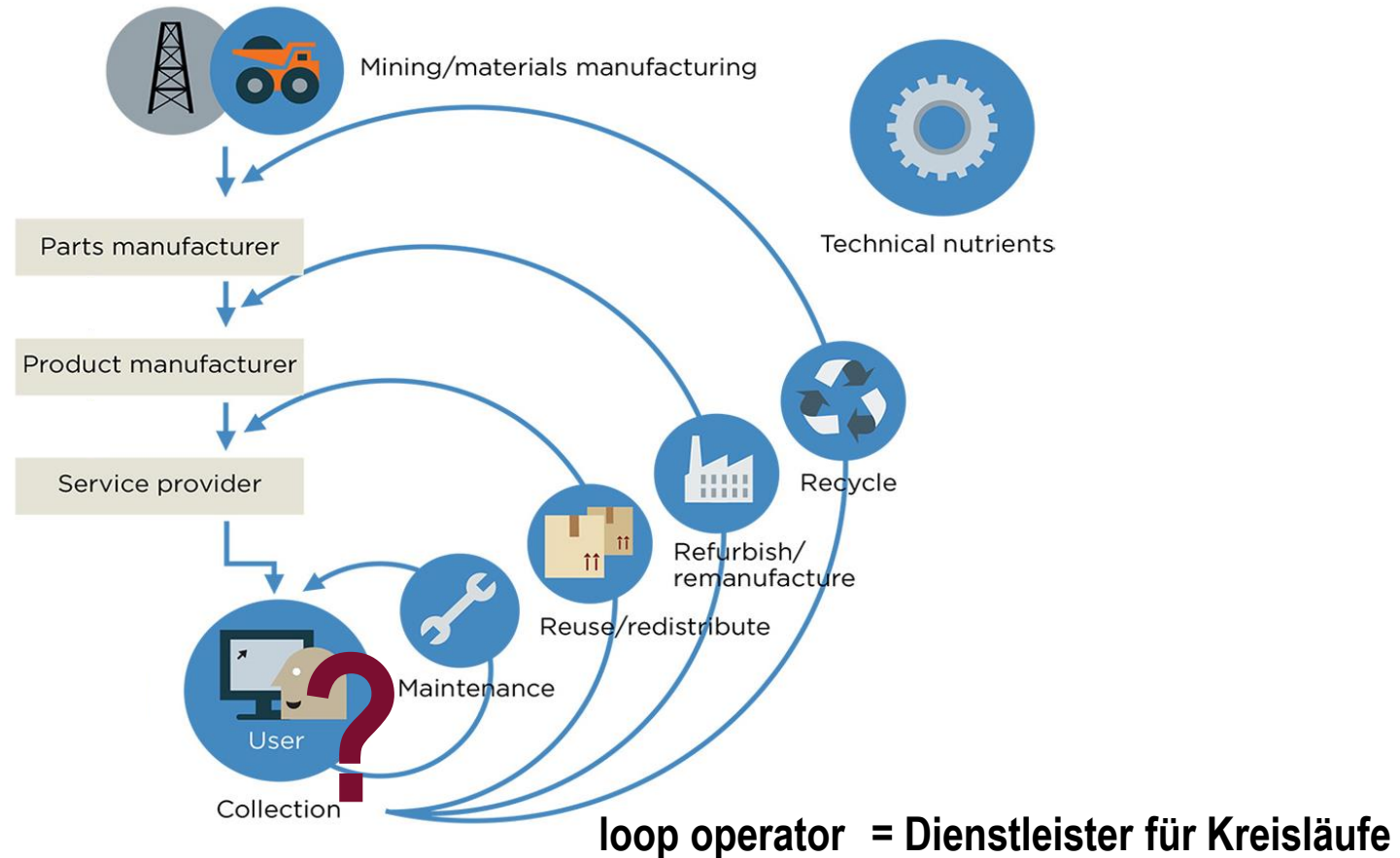
Überblick

— **Einführung**

— **Problemstellung**

— **Methodik**

— **Ergebnisse**

— **Diskussion**

Konzept der Kreislaufwirtschaft (Circular Economy)
Produkte und Materialien zirkulieren auf verschiedenen Ebenen

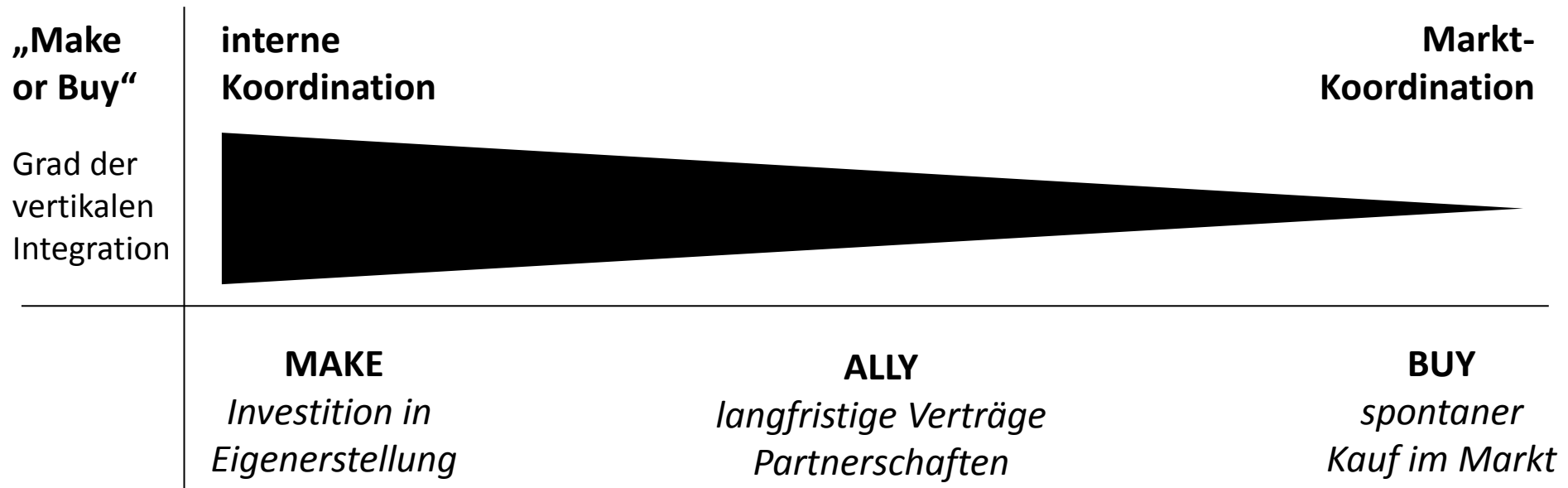loop operator = Dienstleister für Kreisläufe

Forschungsfrage → *Wie tragen unterschiedliche Wertschöpfungsarchitekturen zur Schließung von technischen Kreisläufen in der Smartphone-Industrie bei?*

Theorie: "Make-or-Buy Analyse" aus den Wirtschaftswissenschaften → Zwei grundlegende Formen der Koordination

„Make or Buy"

Grad der vertikalen Integration

interne Koordination

Markt-Koordination

MAKE
Investition in Eigenerstellung

ALLY
langfristige Verträge Partnerschaften

BUY
spontaner Kauf im Markt

Source: Picot et al. 1997, 45

Methodik
Qualitative Fallstudien mit Partnerunternehmen des INaS Netzwerkes

Casestudy-Ansatz nach den Prinzipien von Yin (2009)

— **Explorative** Studie → **lernen und verstehen** im Vordergrund

— Untersuchung von **realen** Gegebenheiten

Fallauswahl

— INaS Partner, Beitrag zur Kreislaufwirtschaft

Auswertung

— **Transkription** der Interviews nach

— Strukturierende **Inhaltsanalyse** (Mayring 2010)

Datentyp	Details	Dokumentation
Semi-strukturierte Interviews*	7 Interviews	Transkripte, Protokolle
Unternehmensbesichtigungen	4 Besichtigungen	Fotos, Notizen
Workshopteilnahme	1 Workshop	Offizielle Dokumentation
Sekundärquellen	Broschüren, Websiten, usw.	PDFs, digitale Kopien

*überwiegend persönliche Interviews vor Ort mit Audioaufnahmen und teilweise Unternehmensbesichtigungen

Methodik
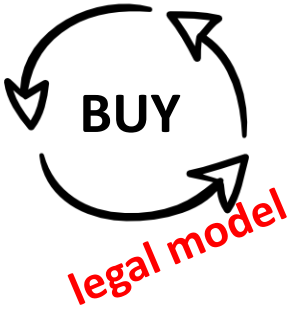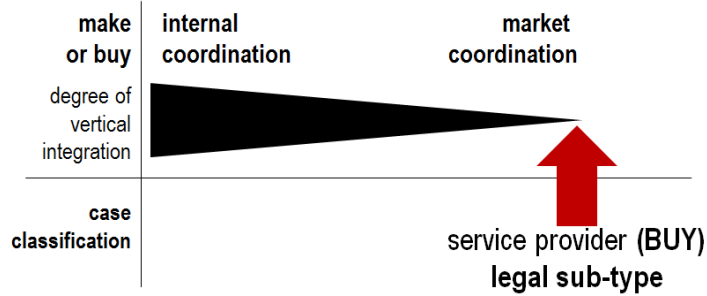# Durchgeführte Interviews mit beteiligten Unternehmen und Experten

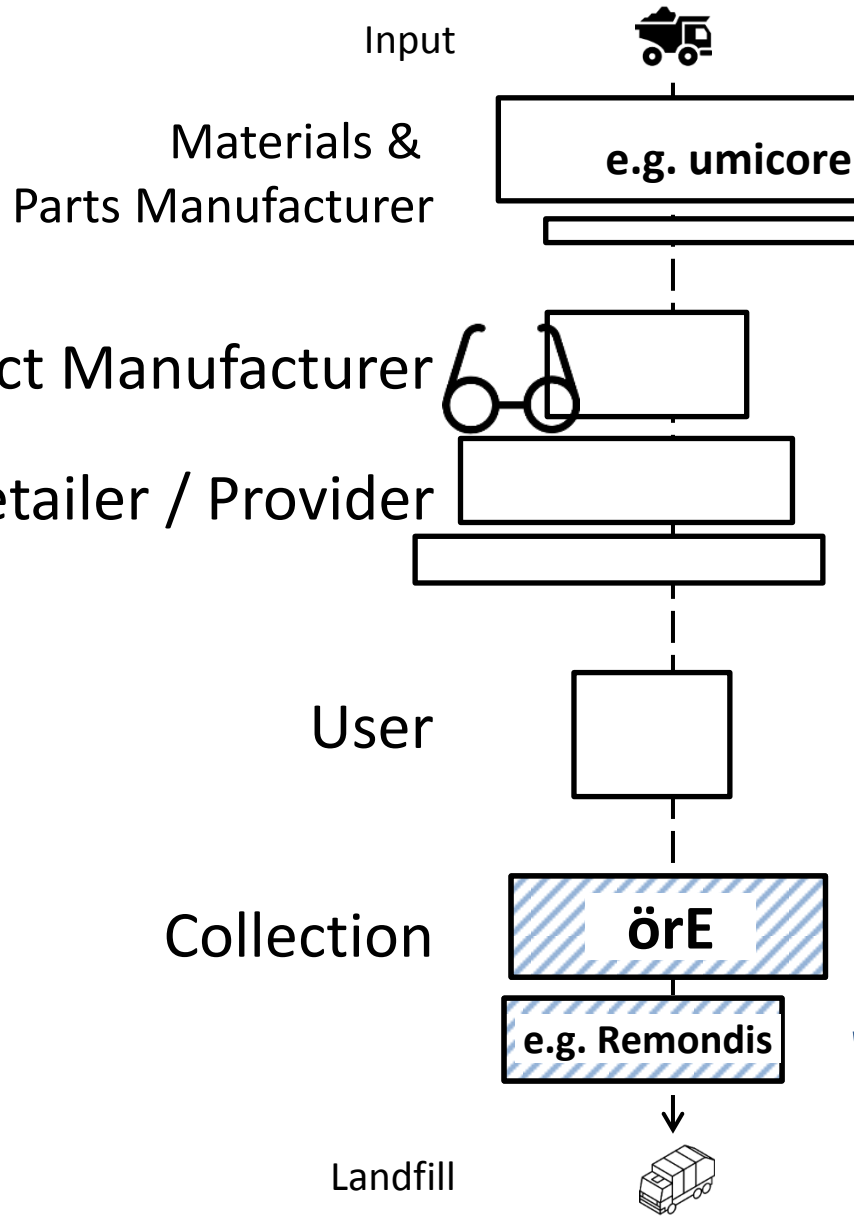| Company	Interviewee Position	Type	Duration	Documents	Site visit?
AfB gGmbH	CSR-Manager/ BD	Formal, skype call w/ video	00:52:00	Audio & Transcript	no
binee UG	CEO	Informal, Telephone interview	00:20:00	Protocol	no
Shiftphone GmbH	CEO	Formal, face-to-face	01:16:00	Audio & Transcript	yes
Teqcycle GmbH	Key-Account Telekom / BD	Formal, face-to-face	00:55:00	Audio & Transcript	yes
akkutauschen UG	CEO	Formal, face-to-face	00:58:00	Audio & Transcript	yes
iPassions GmbH	CEO	Formal, face-to-face	00:43:00	Audio & Transcript	yes
Ritteg Trade + Consulting	CEO	Formal, face-to-face	00:47:00	Audio & Transcript	no

Es können vier unterschiedliche Koordinationstypen unterschieden werden

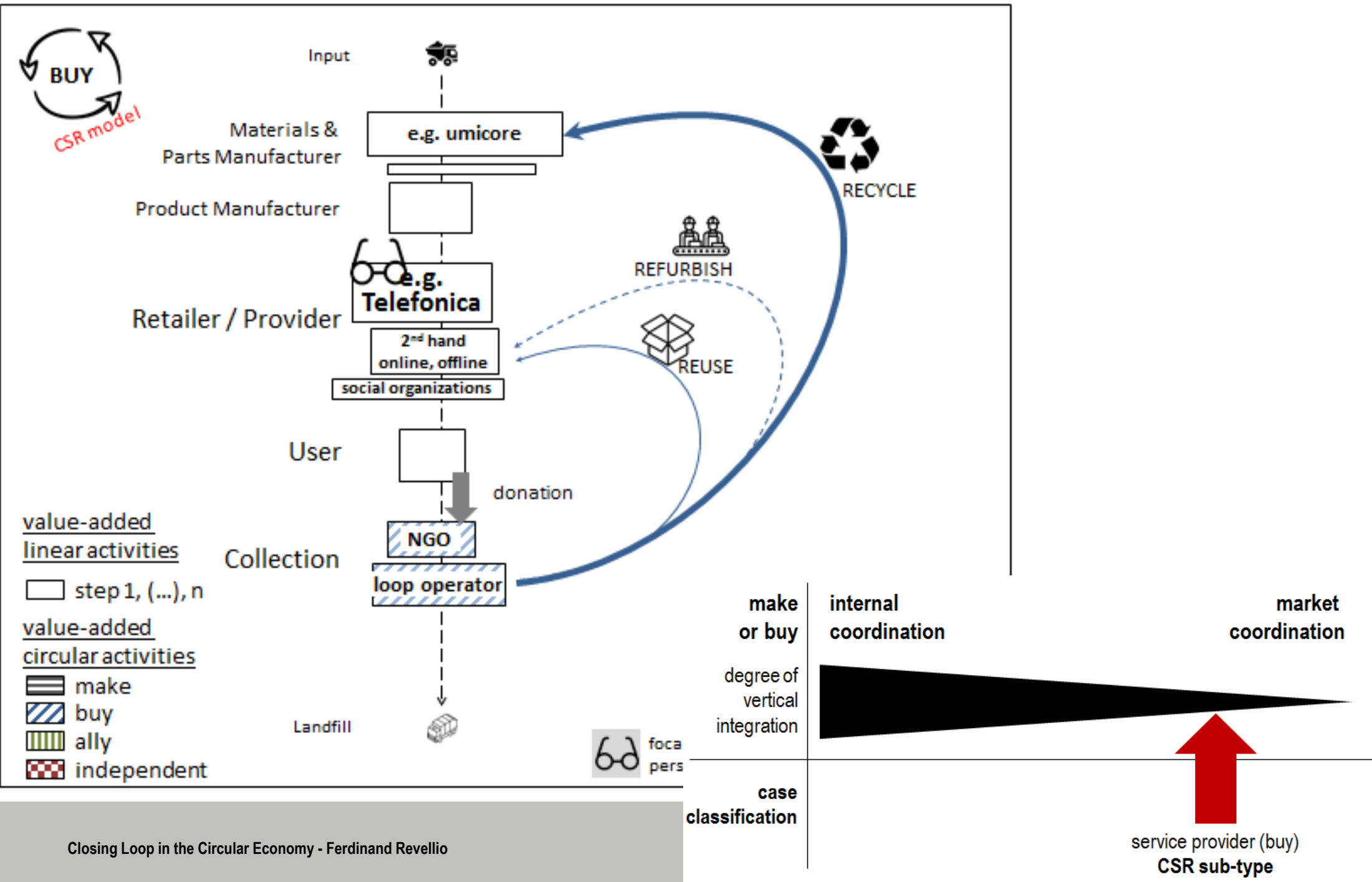| VCA	Coordi-nation	Example	Details	Relationships	CE-loops	Motivation	Barriers
① **Service Provider**	buy/ally	2. CSR sub-type	- collection of unsed mobile devices - in cooperation with an NGO - logistics, data deletion, valuation	contractual arrangements, collaboration with focal actor, exclusivity, mutual relationship	- recycle - reuse - (refurbish)	- intrinsic - legal	- collection
② **Cooperative Network**	ally/buy	1. shareholder type	- many partners work together - different collection types ▪ buy-back & in-store collection - logistics, data deletion, valuation - batch sale to B2B customers	contractual arrangements, collaboration, focal company is shareholder (no influence)	- reuse - recycle - (refurbish)	- economical - legal	- collection
③ **Vertically Integrated**	make	1. intrinsic type	- all loops offered implicitly - only upon request - no monetary value creation - recycling through partner	case example is focal company, engagement in CE-loops,	- maintain - reuse - remanufacture - (recycle)	- intrinsic - qualitative	- communication - partners
④ **Lone Warrior**	independent	2. repair sub-type	- Independent repair shops (online, offline) - Intermediary for spare parts as key partner - Development of internal loops	ambivalent relationship, no connection, some mutual benefits	- maintain - refurbish - (recycle)	- economical - intrinsic	- spare parts - partners

BUY- Relationship: The legal sub-type

Input

Materials & Parts Manufacturer — e.g. umicore

Product Manufacturer

Retailer / Provider

User

Collection — örE

e.g. Remondis

Landfill

ear

RECYCLE

value-added linear activities
☐ step 1, (…), n

value-added circular activities
▤ make
▨ buy
▥ ally
▦ independent

👓 focal actor perspective

make or buy — internal coordination — market coordination
degree of vertical integration
case classification
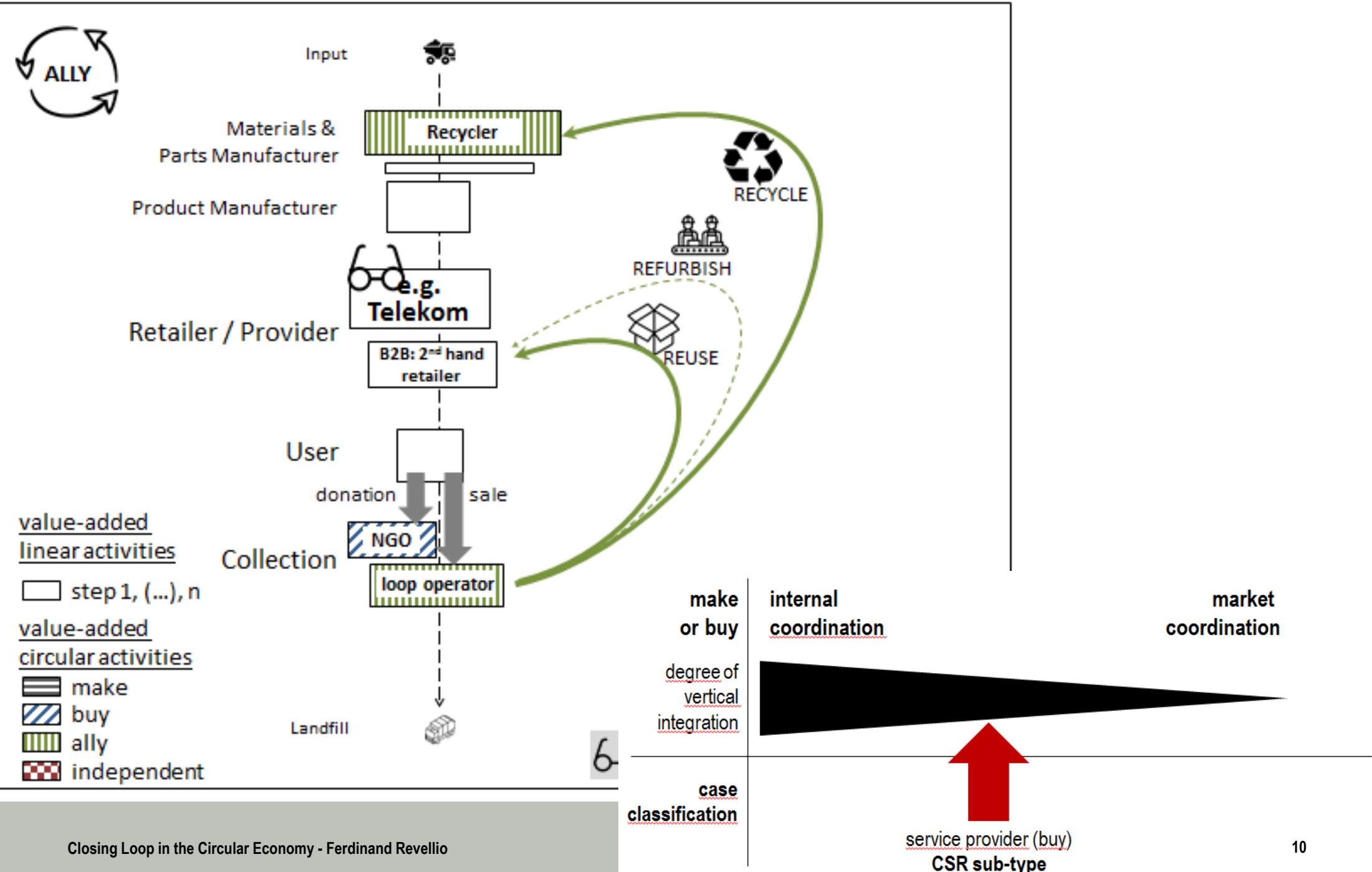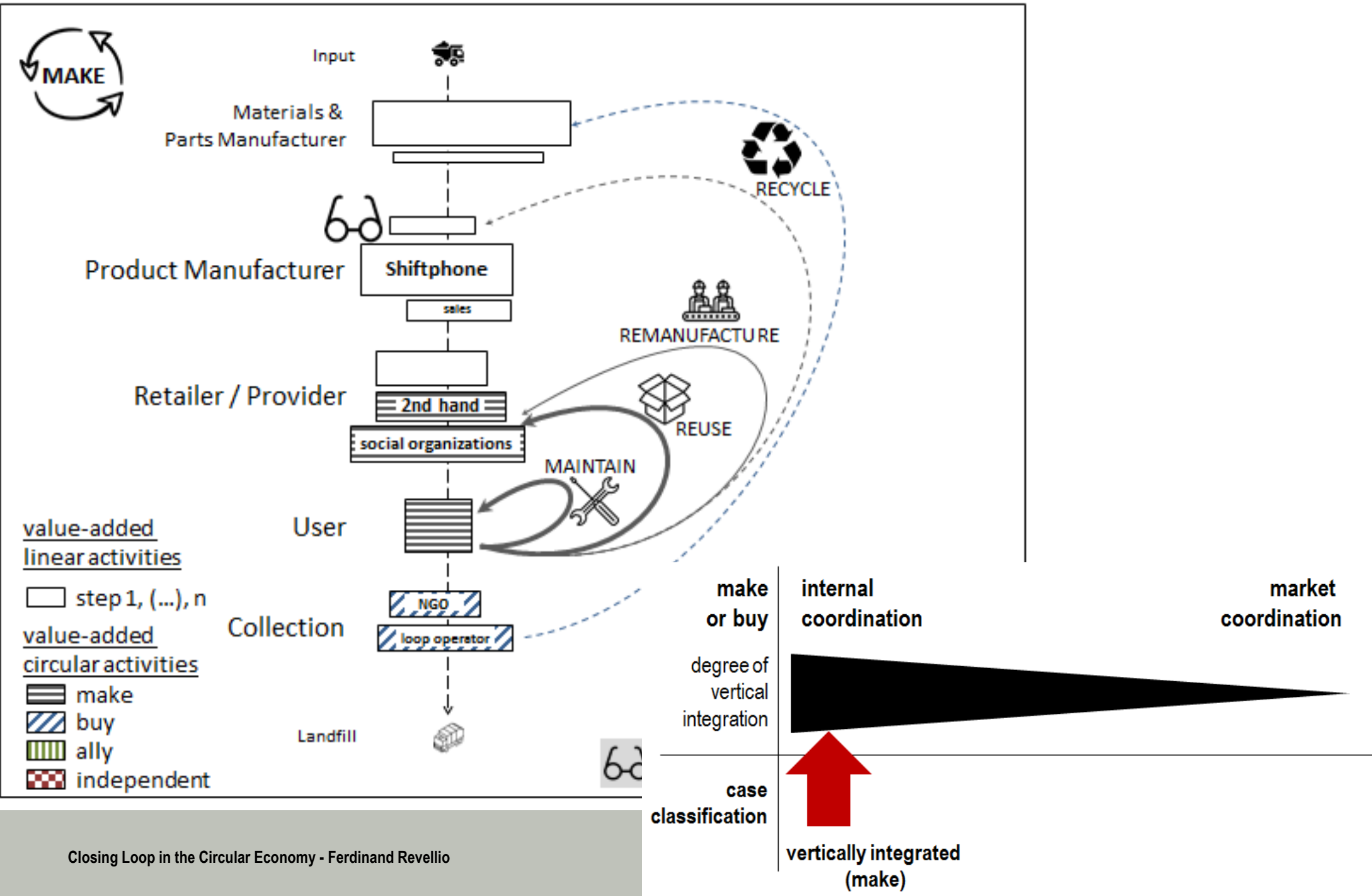service provider (BUY) legal sub-type

BUY — legal model

Der Provider übernimmt zusätzliche Verantwortung (CSR)

Der Provider hat sehr enge Beziehungen zu Loop Operatorn

Der Hersteller übernimmt die Schließung der Kreisläufe selbst

In diesem Fall gibt es keine direkte Beziehungen zu Herstellern

Diskussion der Ergebnisse

— Generell **erhöht sich das Koordinationsniveau** in einer Kreislaufwirtschaft

— **Akteure** wählen **unterschiedliche Ansätze** damit umzugehen

1. gesetzliche **Anforderungen** erfüllen (nur Recycling)
2. **Verantwortung übernehmen** (weitere Loops durch Kooperation mit Dienstleistern)
3. **Kreisläufe selber schließen** (viel Handlungsspielraum , viel Aufwand)
4. **Nichts tun** → es bilden sich **unabhängige Akteure** (die auch sehr innovativ sind)

— Die **Anforderungen** von technischen Kreisläufen der Circular Economy **unterscheiden sich** sehr stark **von linearen Tätigkeiten**

— Gleichzeitig sehr spezifische **Investitionen** notwendig

— **Keine einfache marktliche Koordination** möglich

→ **Kooperation** zwischen unterschiedlichen **Marktteilnehmern** notwendig

— **"Loop Operator"** haben sehr **speziefisches Wissen** über Kreisläufe

→ **Hohes Innovationspotential** durch Kooperation

Vielen Dank für Ihre Aufmerksamkeit!

Gibt es Fragen oder Anmerkungen?

Discussion of preliminary results

— Loop operators develop three different revenue models
  - "pay per service"
  - "freemium" (value of devices = costs of operations)
  - "win-win" (value of devices > costs of operations)

— And three different collection types
  - Directly at user (buy-back schemes)
    - Automated buy-back ("you only get a new phone, when you sell us your old phone") customer retention
    - Buy-back to (increase market share)
    - Independent buy-back
  - Through legal tack-back schemes
  - Collection via NGO

The lone warrior is exploiting a niche that emerged from the abscence of efficiant alternatives

In-vivo citations:

— „we are fully self-sufficient" (indi_1, 48)

— „they [focal actors] could be absolute rigorous […] ‚original spare sparts ONLY through us' " (indi_1, 95)

— „but they [focal actors] purposley allow the flow of spare parts, somehow." (indi_1, 97)

— „we are better in [repairing] most of the things. I can solve problems that Apple employees wouldn't even understand" (indi_2, 54)

— „officially we are unwanted, inofficially we are the basis of their success" (indi_2, 100)

— „they couldn't do without us […] if we wouldn't be there and point out to their bugs" (indi_2, 102)

— „I think a good example is the automobile industry [..] every garage can put a stamp in my service booklet" (indi_1, 99)

— „in the car industry there is a tuning community, they get the maximum out of these cars. And that we do with Smartphones" (indi_2, 98)

→ **The <u>relationship</u> between indipendent loop operators and focal actors can be described as being <u>ambivalent</u>**
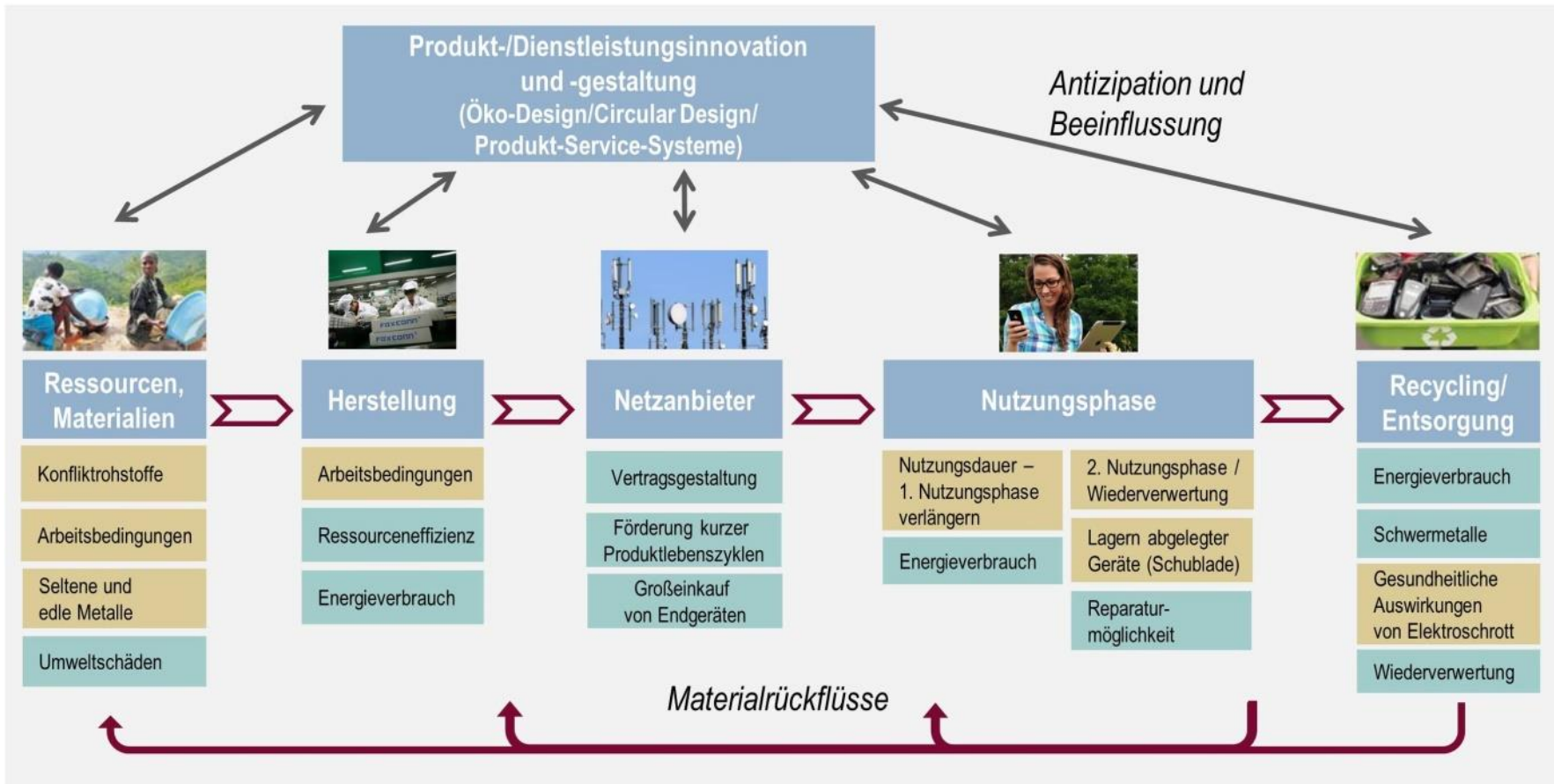
Technical loops follow an explicit order from top to bottom: maintaining products as long as possible and thereafter refurbish or recycle them

EMF-loop	Strategy	Product recovery	Level of Disassembly	Quality Requirements	Resulting Product
maintenance	slowing loops	repair / maintain	product level	Restore product to working order	Fixed or replaced by spares
reuse/ redistribute	slowing loops	reuse	N.A.	Functioning product	Second, third, ... life
refurbish/ remanufacture	closing loops	re-furbishing	module level	Inspect all critical modules and upgrade to specific quality level	Some modules repaired/replaced with potential upgrades
		remanu-facturing	part level	Inspect all modules and parts and upgrade as new quality	Used or new parts combined into new product with potential upgrade
		cannibalization	part level	Depends on purpose	Some parts reused; remaining product recycled or disposed
recycle	closing loops	recycling	material level	Goal: No down-cycling of materials	Materials reused to produce new parts

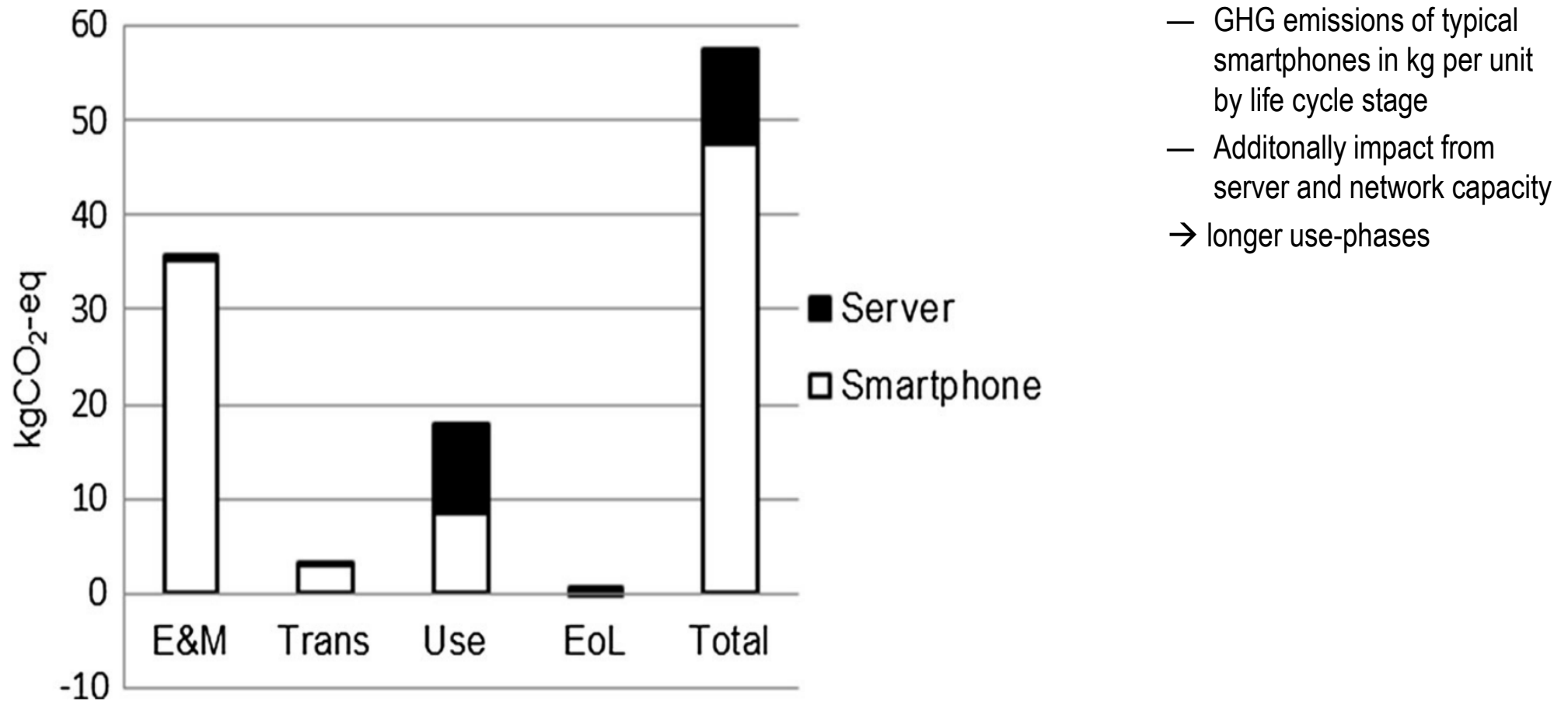# Sustainability Challenges along a typical Value Chain of Smartphones (in German)

Source: INaS Project, Leuphana University of Lüneburg

Short life times of smartphones are undesirable due to major environmental impacts (here: GHG emissions) during the production phase

— GHG emissions of typical smartphones in kg per unit by life cycle stage

— Additonally impact from server and network capacity

→ longer use-phases

Source: Suckling & Lee 2015, 1185