



LIFESAVING

extending service life

Sustainable Business Models to Extend the Lifetime of Mobile Internet-Enabled Devices

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**University of
Zurich**^{UZH}

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Lifetime Extension of MIEDs

Motivation



Mobile Internet-Enabled Devices (MIEDs)

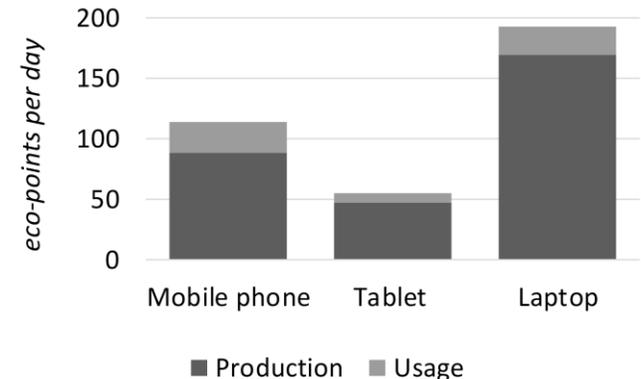
Contribution of ICT sector to global greenhouse gas emissions



Belkhir (2018): Assessing ICT global emissions footprint: Trends to 2040 & recommendations

Result of our project “Digital sufficiency”

- Production phase has greatest impact
- Lifetime extension has great potential to reduce the ecological footprint



Keller (2019): Projekt Digitale Suffizienz - Ökobilanzbericht zur Nutzung digitaler Geräte durch Jugendliche in der Schweiz

Project Team and Partners



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Consumer behaviour

ZHAW Life Cycle Assessment Research Group





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Behavioural intervention design and evaluation

UZH Informatics and Sustainability Research




Prof. Dr. Lorenz Hilty Jan Bieser

Market & actor analysis, Knowledge Integration

Indirect effects








Project Overview

Phases



Theses

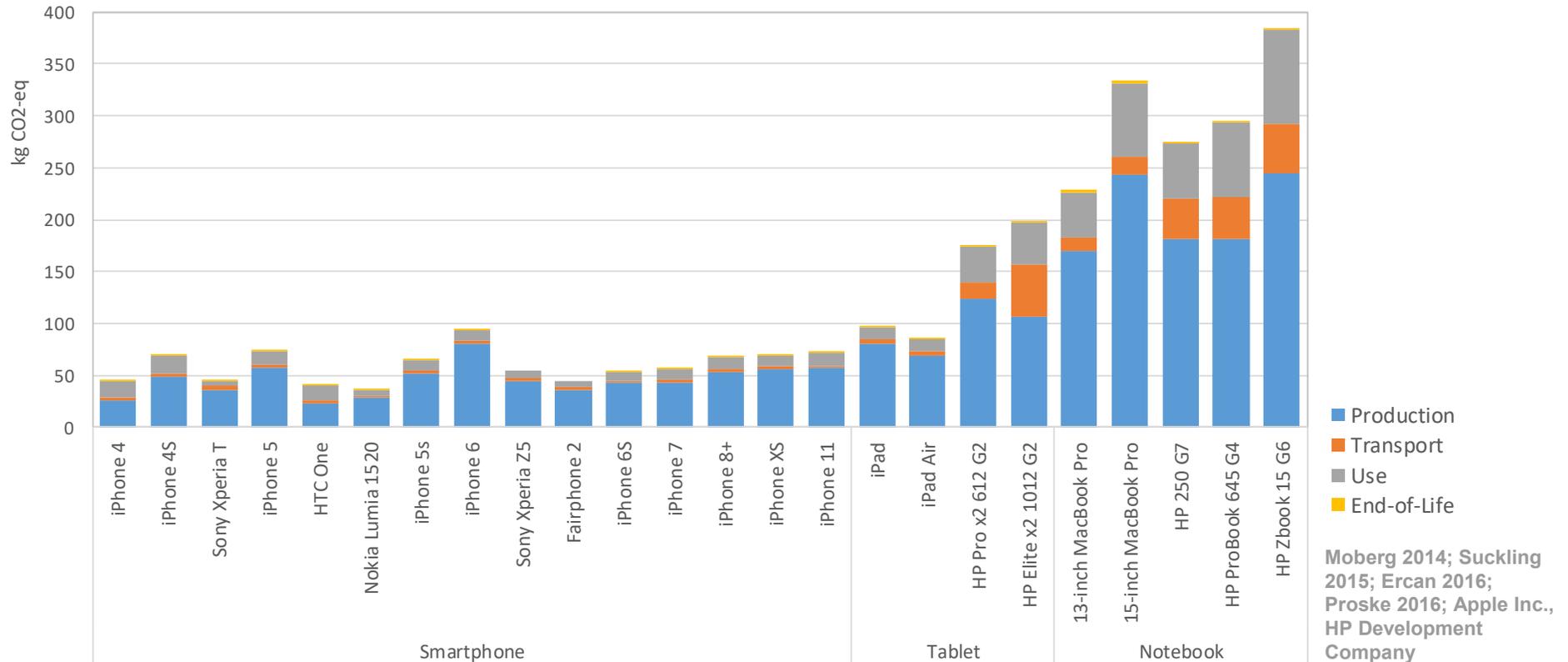


Thesis 1

Lifetime extension reduces environmental impacts



Greenhouse gas emissions in the life cycle of various devices



Production phase dominates ⇒ lifetime extension is a promising approach

Thesis 1

Lifetime extension reduces environmental impacts



- **Novel LCI models for MIEDs** are being developed to evaluate measures promoting lifetime extension
- We adjust the existing publicly available LCIs based on:



IC's **die size area**
in smartphones

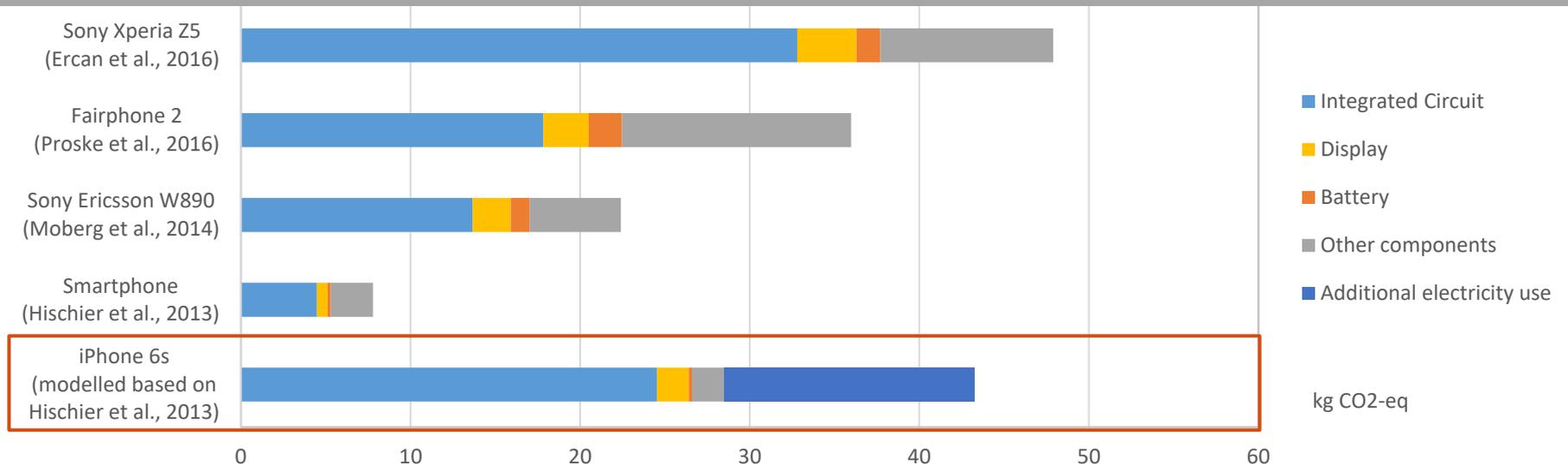


Materials



Energy for production

Global Warming Potential of the Production Phase per Module



Thesis 2

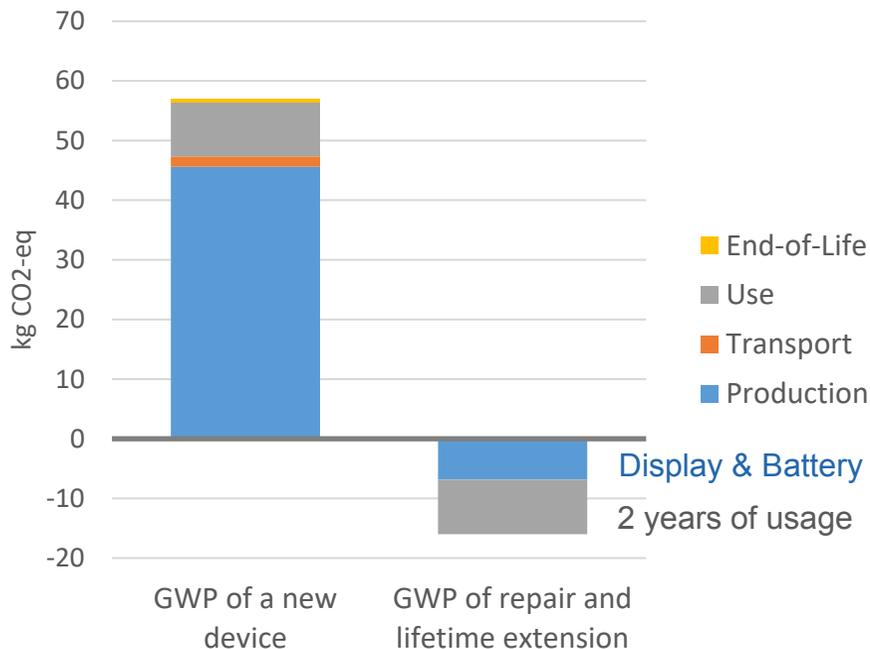
Consumer decisions are key determinants of lifetimes



Consumer assumptions

- Producers are to blame for planned obsolescence
- Disposal is perceived as a major problem
- Second-hand devices will break down more quickly

Interviews were conducted by ZHAW
Media Psychology Research Group



Much higher production than disposal impacts



Repair of battery & display hardly relevant



Doubling the lifetime of a smartphone (2 to 4 years)



saves 72% emissions of a new device

Thesis 3

Decision in a complex socioeconomic context



Measures to extend the lifetime of MIEDs



Improved product design

- Increased longevity of soft- and hardware
- Modular design

Retention

- Delaying the replacement
- E.g.: bumper case, warranty, repair service

Recirculation

- Second life for old devices
- E.g.: buying second-hand, donate devices

Project Goal

Exploration of sustainable and viable business models



CURRENT PROBLEM



Stock of old devices at home



Second-hand devices are often not considered



Customers' wish to always have the latest devices



Renewing contracts including a new smartphone

POTENTIAL BUSINESS MODEL

Trade-in/Take-back offers

Parallel offer of Second-Hand and new devices in one shop

Binding consumers to their devices, e.g. through engraving

Interest-free leasing of devices for 3+ years

Business Models

Interest-free device leasing



Interest-free leasing with 3+ years duration



The new price is amortized over this period



Offer includes a repair claim

Create **incentives** to use the device for at least three years

Business Models

Including a guide for action

App or website in which LCA results are integrated as a guide for action.

Example:  **thingsy**

- Manage warranty receipts,
- repair,
- share,
- donate,
- and resell device via App



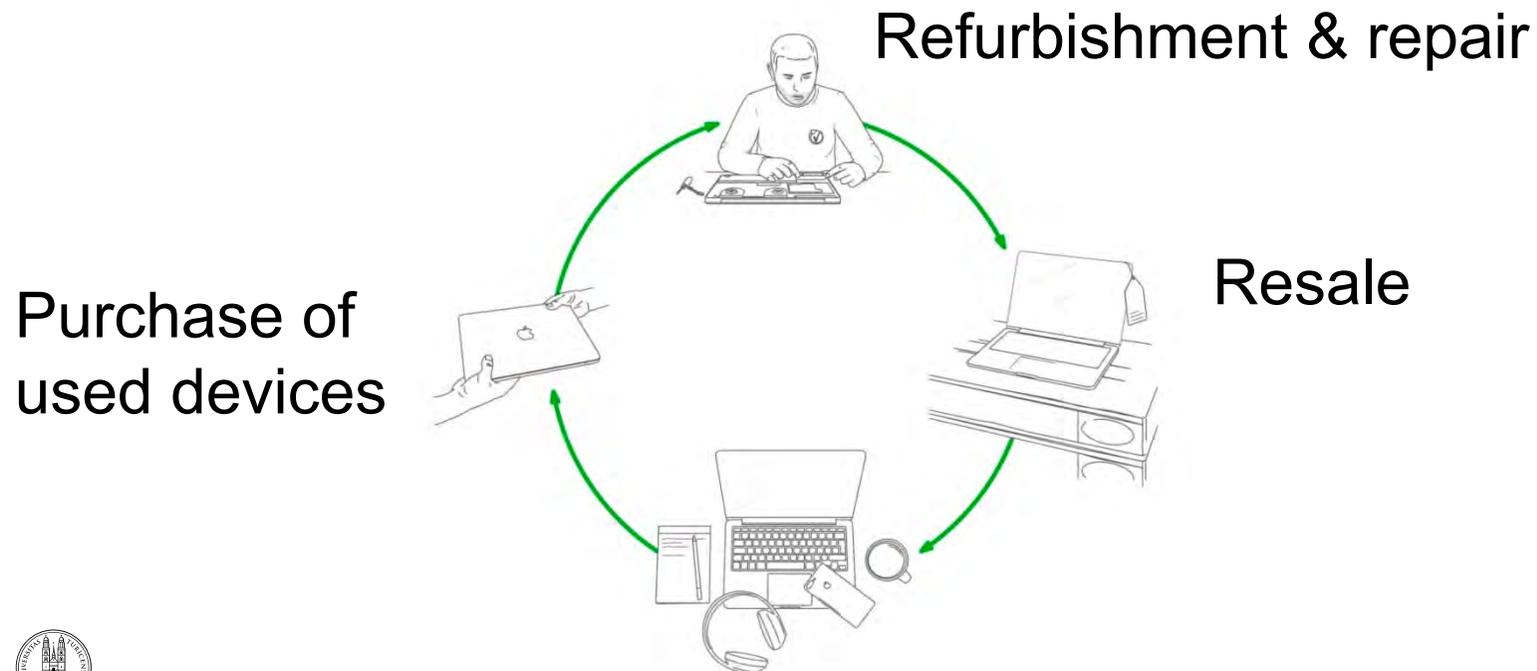
<https://thingsy.ch/>

Business Models

Involve actors for recirculation

Shop that offers second-hand devices

Example:  revendo.ch



Indirect Effects

- Possible indirect effects need to be considered
- Can be **positive or negative** for the environment

POSITIVE



A smartphone
replaces many
devices

NEGATIVE



Saved money is spent on
other goods or services
with environm. impacts

- The UZH Informatics and Sustainability Research Team will identify negative indirect effects and measures to mitigate these

UZH Informatics and Sustainability Research



Prof. Dr. Lorenz Hilty



Jan Bieser

Conclusion

Which instruments are most useful for combining environmental, economic and societal aims?



Economically viable business models, which have **environmental benefits** and are **socially accepted**, have great potential to incentivise a more sustainable use of mobile internet-enabled devices.



Conclusion

Lifesaving Project



A **combination of different perspectives** is required for a comprehensive picture of how best to extend lifetime



Focus on **overcoming consumer barriers** and measure's performance in **real-world settings**

Thanks for your attention!



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