



# The Dark Sides of Sustainable ICT

Cannibalism and Unequal Exchange of Environmental Destruction

Per Fors  
Interconnexions entre transitions numérique et  
écologique workshop, 9th of June 2022

# About me and what I do

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IFIP TC 9 WG9.9 ICT and Sustainable Development

Research interests (within Sustainable ICT):

- Sustainability and ethics within the platform economy

- Sustainability of the Digital Industrial Transformation

- Sustainable gamification

# IFIP TC9 WG 9.9

**IFIP:** “The International Federation for Information Processing (IFIP) is a global organisation for researchers and professionals working in the field of computing to **conduct research, develop standards and promote information sharing**”

## **TC9: ICT and Society**

To develop understanding of how ICT innovation is associated with change in society;

To influence the shaping of socially responsible and ethical policies and professional practices.

## **WG9.9: ICT and Sustainable Development**

# The organization

TC 1: Foundations of Computer Science

TC 2: Software: Theory and Practice

TC 3: Education

TC 5: Information Technology Applications

TC 6: Communication Systems

TC 7: System Modeling and Optimization

TC 8: Information Systems

**TC 9: ICT and Society**

TC 10: Computer Systems Technology

TC 11: Security and Protection in Information Processing  
Systems

TC 12: Artificial Intelligence

TC 13: Human-Computer Interaction

TC 14: Entertainment Computing

WG 9.1 Computers and Work

WG 9.2 Social Accountability and Computing

SIG 9.2.2: Special Interest Group on Framework on  
Ethics of Computing

WG 9.3 Intelligent Communities

WG 9.4 The Implications of Information and Digital  
Technologies for Development

WG 9.5 Our Digital Lives

WG 9.6 Information Technology Mis-use and the Law

WG 9.7 History of Computing

WG 9.8 Gender, Diversity and ICT

**WG 9.9 ICT and Sustainable Development**

WG 9.10 ICT Uses in Peace and War

Value chain phase	Sustainability-related problems
Extraction of raw materials	Working conditions (including slave labour, child labour, lack of safety equipment, long working hours, unionizing not permitted, etc.), hazardous waste, use of hazardous chemicals, emissions of greenhouse gases (GHGs), conflict minerals, unequal exchange (Lennerfors et al., 2015), geopolitical problems related to Rare Earth Elements (REEs), resource scarcity, corruption, etc.
Transportation and manufacturing	Working conditions (including slave labour, child labour, lack of safety equipment, long working hours, unionizing not permitted, etc.), hazardous waste, use of hazardous chemicals, emissions of GHGs, corruption, etc.
Use	Electricity use (especially in data centers) and emissions of GHGs, online fraud and harassment, privacy, censorship and corruption, algorithmic bias, accountability and transparency, etc.
Disposal	Problems related to recycling, refurbishing and reuse, illegal and semi-legal exportation of e-waste leading to problems related to informal recycling, e.g., hazardous waste, use of hazardous chemicals, emissions of GHGs, slave labour, child labour, lack of safety equipment, etc.



# Clean, dirty or sustainable?

From Green IT to Sustainable ICT

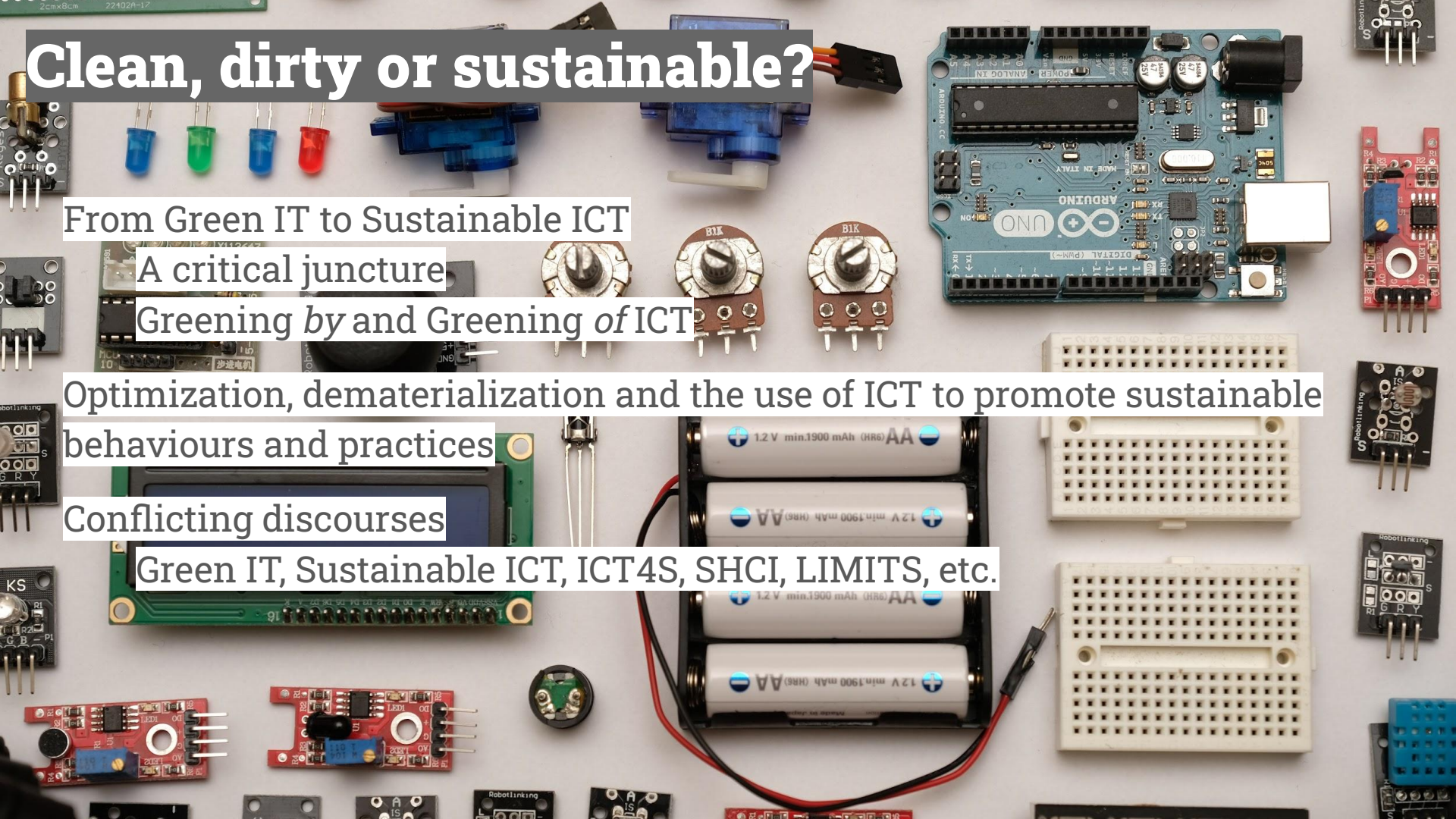
A critical juncture

Greening *by* and Greening *of* ICT

Optimization, dematerialization and the use of ICT to promote sustainable behaviours and practices

Conflicting discourses

Green IT, Sustainable ICT, ICT4S, SHCI, LIMITS, etc.



Mindset	Summary
1. Socio Ecological restoration over economic justification	Economic development or reasoning is here not dismissed, but seen as a means to achieve social, cultural and environmental benefits.
2. Transformative system change over small steps to keep business as usual	Most research within ICT4S and related fields focuses on small, incremental steps towards sustainability – mainly energy and resource efficiency. Transformational systems change means to move beyond the assumption that sustainability can be achieved through (many) marginal lifestyle changes.
3. Holistic perspectives over narrow focus	“This item refers to bigger-picture thinking. This bigger picture applies to time, space, disciplinary boundaries, species boundaries, approaches to inquiry and so on” (Mann et al., 2018, p. 217).
4. Equity and diversity over homogeneity	“Diverse systems are resilient systems. The call for diversity can be seen to be in tension with the need to transform to sustainability at scale. But it does not mean a homogenous one-size-fits-all solution.” (Mann et al., 2018, p. 218).
5. Respectful, collaborative responsibility over selfish othering	ICT4S research should focus on supporting collective action rather than to focus on the role of the individual.

6. Action in the face of fear over paralysis or wilful ignorance	Complex, “wicked” problems related to sustainability require long-term solutions, and ICT4S can contribute with such solutions.
7. Values change over behavior modification	Persuasive technologies have been extensively researched within SHCI and ICT4S for decades now, however, the effectiveness of such applications to contribute to radically transform our society towards sustainable futures is unclear. Rather, we need to work with embedding sustainability as a core cultural value.
8. Empowering engagement over imposed solutions	“By empowering individuals and groups, and ensuring that they are engaged, any actions that are taken are likely to be more successful than if ‘outside experts’ impose solutions” (Mann et al., 2018, p. 220).
9. Living positive futures over bleak predictions	In order to work towards sustainable futures we obviously need to know how bad the situation really is, and what we need to do to change current unsustainable trajectories. However, it is even more important to focus on possible solutions to be able to live within planetary boundaries and other limits.
10. Humility and desire to learn over fixed knowledge sets.	As Bendor (2017) puts it, sustainability is not a complex problem to solve. We cannot hope to achieve complete knowledge about the problem or the solutions, but we need to keep up the desire to learn, and to keep challenging conventional underlying assumptions and understandings.

*Table 2: The sustainability-based transformation mindset, adapted from Mann et al. (2017) and Mann et al. (2018).*

## Three abstractions in Sustainable ICT

The Technological

The Social

The Sustainable

*Research on ICT (and sustainability) should aim to influence collective action and futurescaping through mobilizing discourse about our co-existence in futures of scarcity and environmental strain*

## Problematizing Sustainable ICT

Per Fors





# Unequal exchange of environmental destruction

An ecological world-systems perspective on the ICT value chains (Lennerfors et al., 2015)

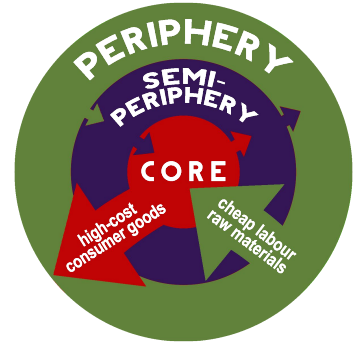
Focusing on environmental destruction rather than economic inequalities

Alf Hornborg – The Power of the Machine (Hornborg, 2001; 2010)

Technology fetishism

Zero-sum or cornucopia? (Hornborg, 2015)

Discourse vs material reality



# Technology use as cannibalism

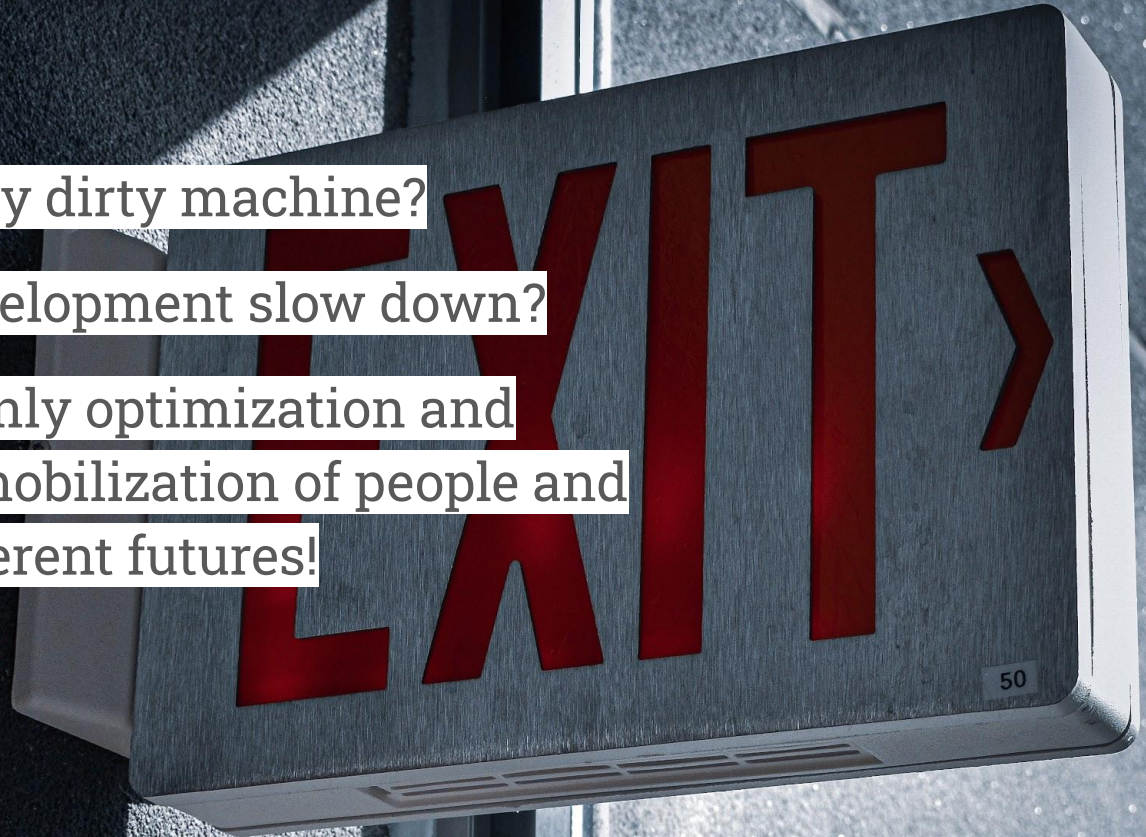


# Conclusions

Sustainable and green by dirty machine?

Should and will ICT development slow down?

Sustainable ICT is not only optimization and dematerialization, but mobilization of people and discourses towards different futures!



# References

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