IT och hållbarhet

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Datateknik
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Lektor i MDI med inriktning mot hållbarhet

Undervisar i tvärsnittet mellan IT och hållbarhet

Sustainable Futures Lab

Research focus

1. The role of ICT in the transition to a more sustainable society: a good life within planetary boundaries
   - *Food*
   - *Energy*
   - *Transport*
   - *Cities*
2. Futuring (futures studies, design fiction, critical & speculative design, counterfactual scenarios)
3. ICT & Sustainability education

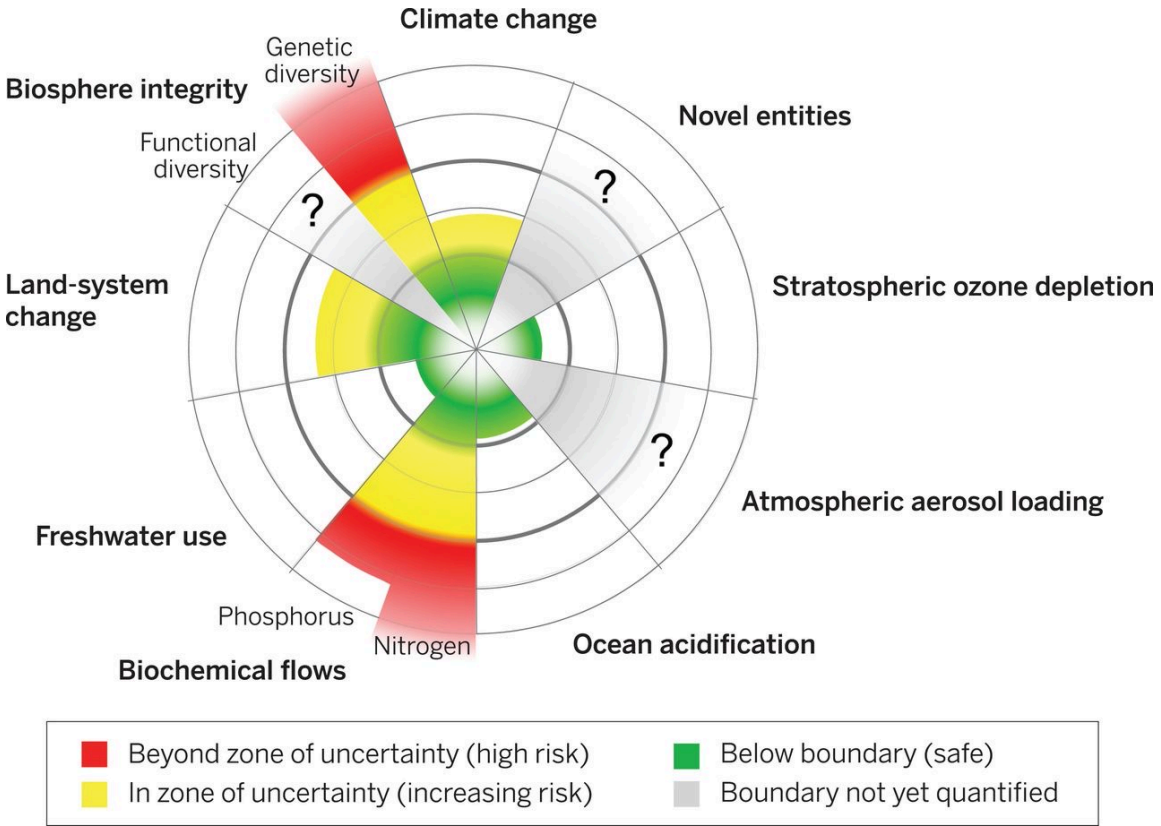
(Picture: Azote Images for Stockholm Resilience Centre)

https://www.kth.se/sv/hct/mid/research/sflab

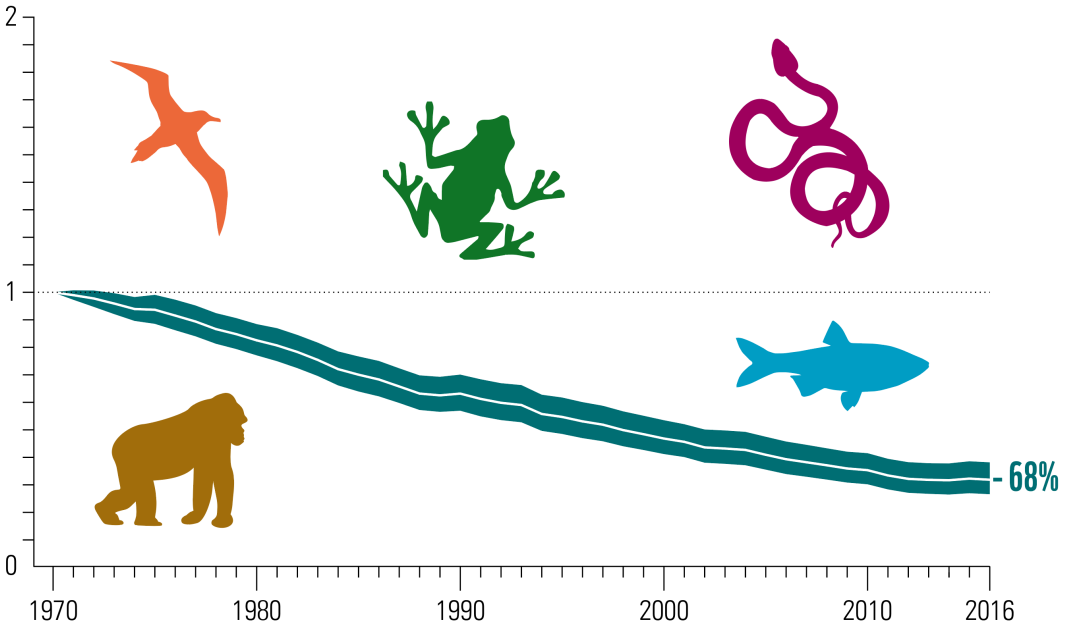

Nasa

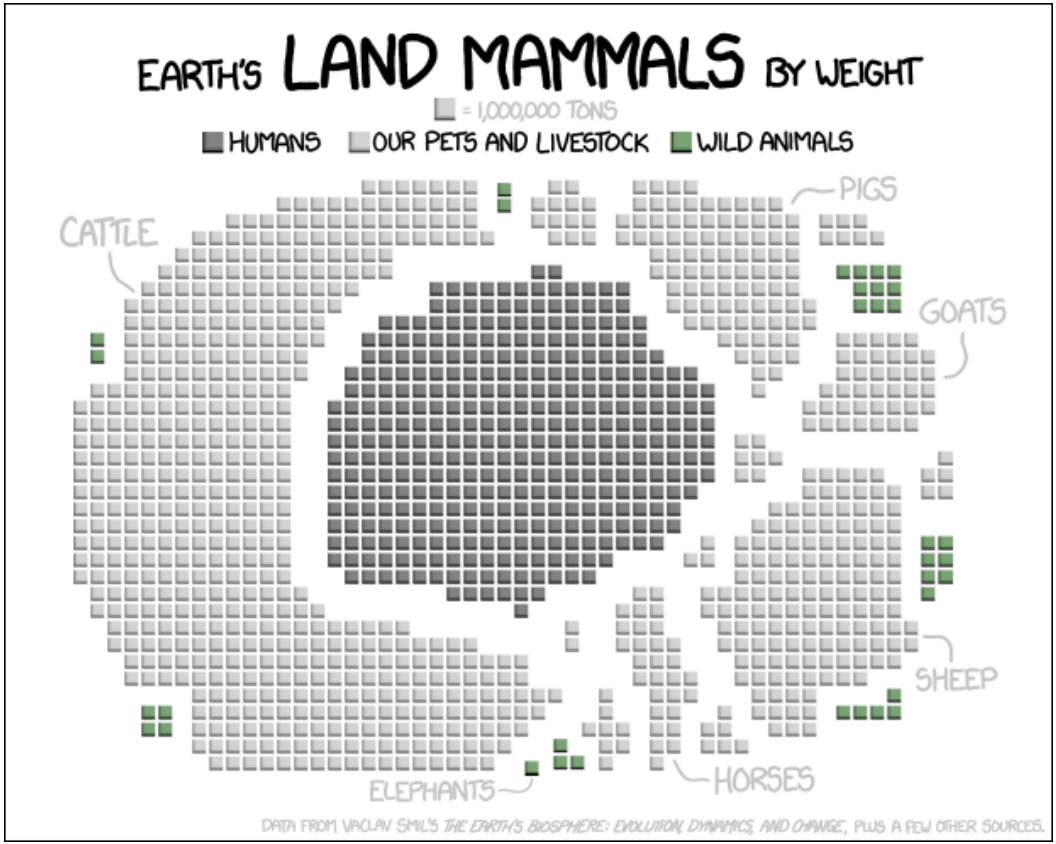
Planetära gränser

(Steffen et al., 2015)

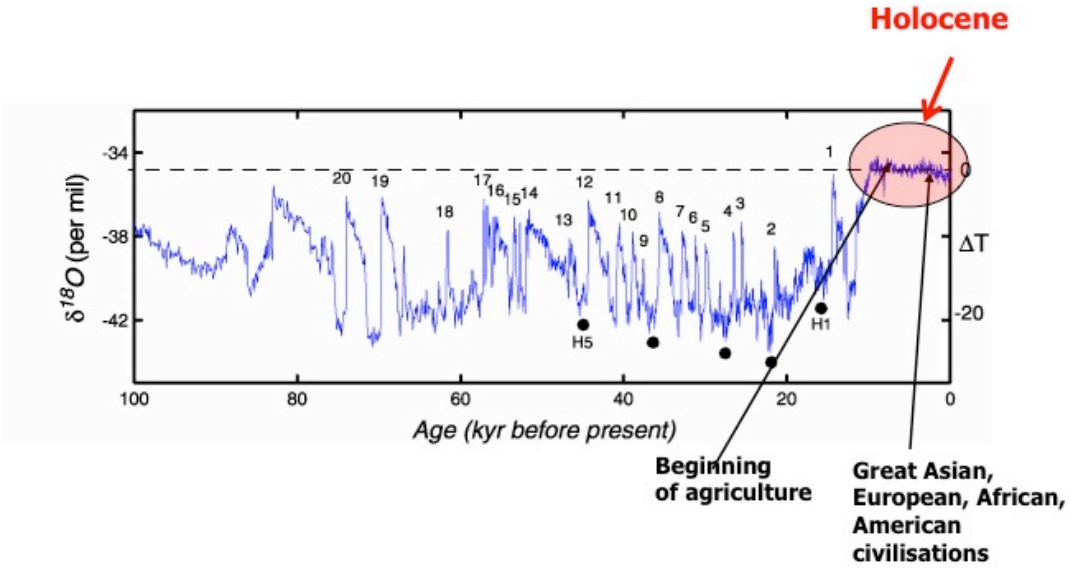


Living planet index 2020




EARTH'S LAND MAMMALS BY WEIGHT
= 1,000,000 TONS
HUMANS
OUR PETS AND LIVESTOCK
WILD ANIMALS
CATTLE
PIGS
GOATS
SHEEP
HORSES
ELEPHANTS
DATA FROM VACLAV SMIL'S THE EARTH'S BIOSPHERE: EVOLUTION, DYNAMICS, AND CHANGE, PLUS A FEW OTHER SOURCES.

Holocene – civilisationer föds



Supplementary material to (Steffen et al. 2015)

CO_2 i atmosfären

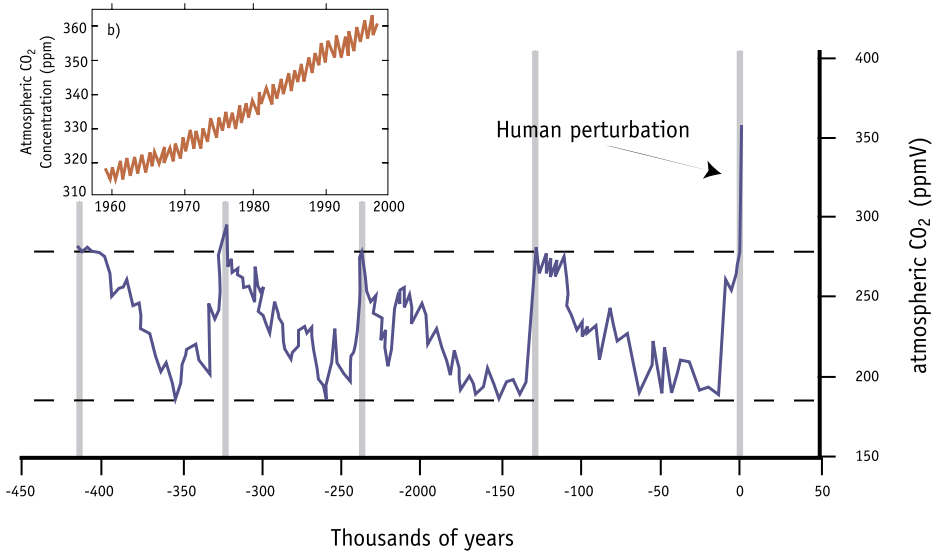
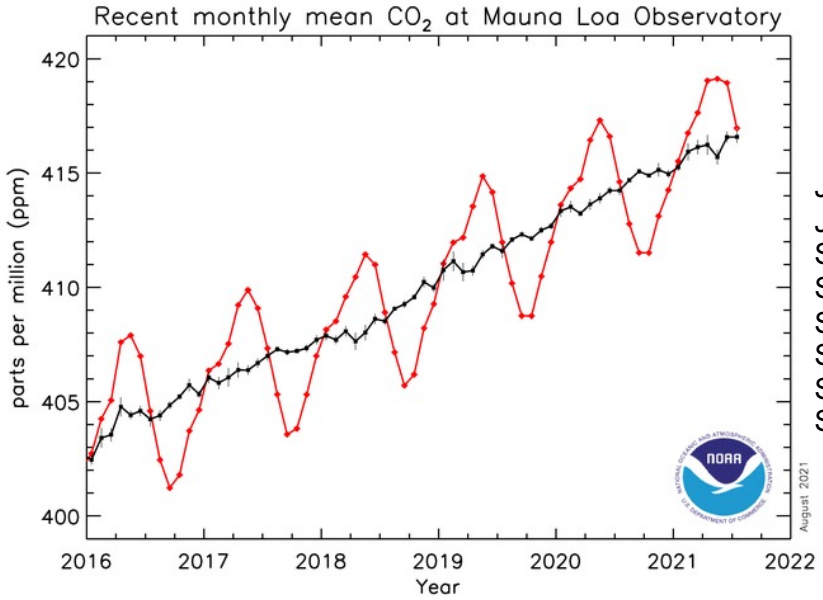


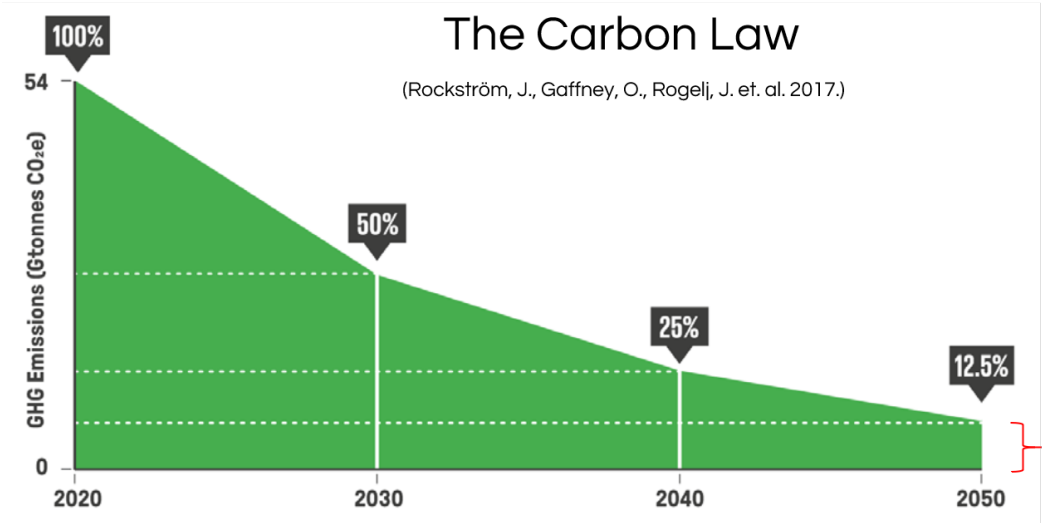
Figure 2. Atmospheric CO_2 concentration from the Vostok ice core record with the recent human perturbation superimposed. The inset shows the observed contemporary increase in atmospheric CO_2 concentration from the Mauna Loa (Hawaii) Observatory.
Sources: Petit et al. (1999) Nature 399, 429-436 and National Oceanic and Atmospheric Administration (NOAA), USA

Natural seasonal variations and trends



July 2022:	418.90 ppm
July 2021:	416.96 ppm
September 2020:	411.29 ppm
September 2019:	408.54 ppm
September 2018:	405.51 ppm
September 2017:	403.38 ppm
September 2016:	401.03 ppm
September 2015:	397.63 ppm

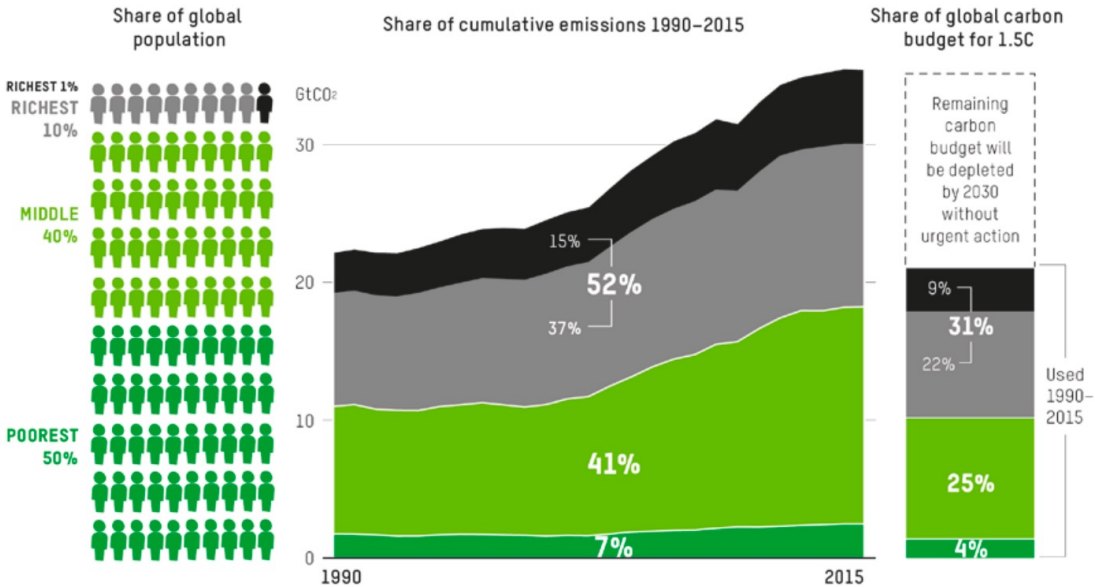
Vad är målen?



https://exponentialroadmap.org

Klimaträttvisa

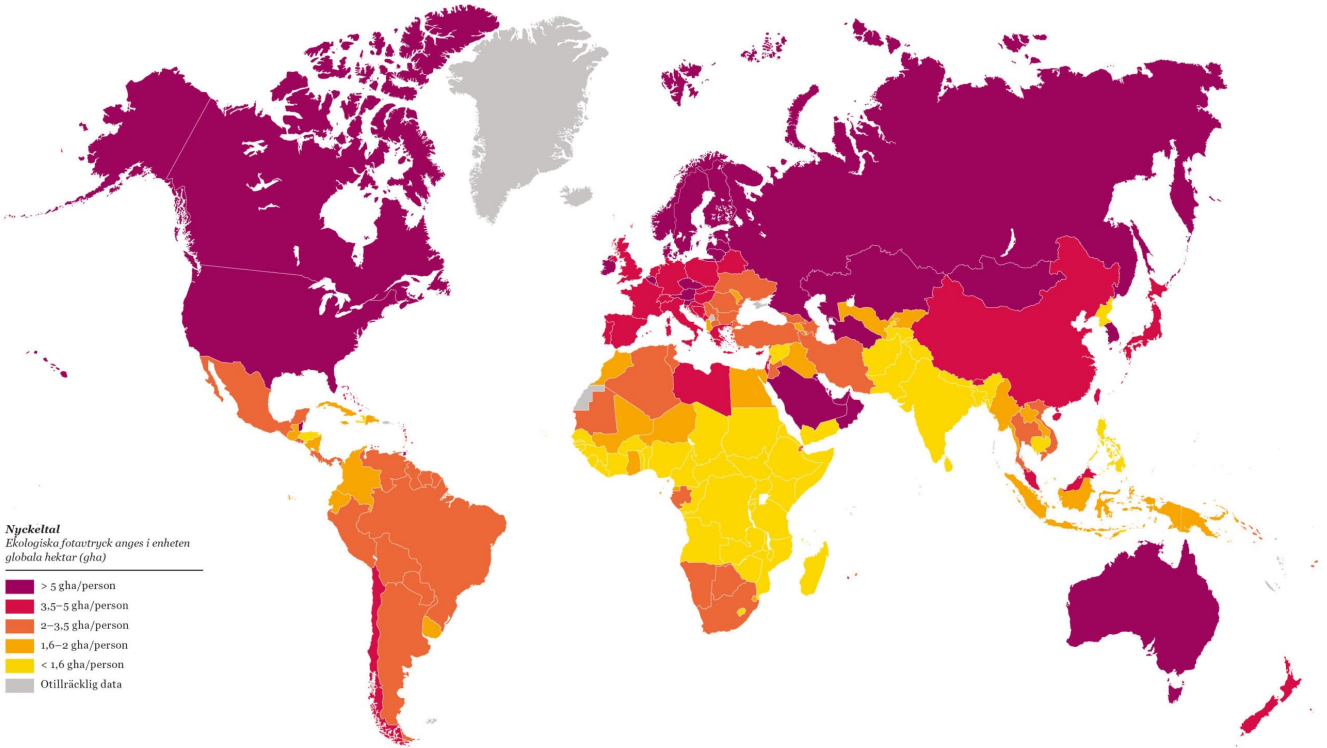
Figure 1: Share of cumulative emissions from 1990 to 2015 and use of the global carbon budget for 1.5C linked to consumption by different global income groups



Per capita income threshold (SPPP2011) of richest 1%: $109k; richest 10%: $38k; middle 40%: $6k; and bottom 50%: less than $6k.
Global carbon budget from 1990 for 33% risk of exceeding 1.5C: 1,205Gt.

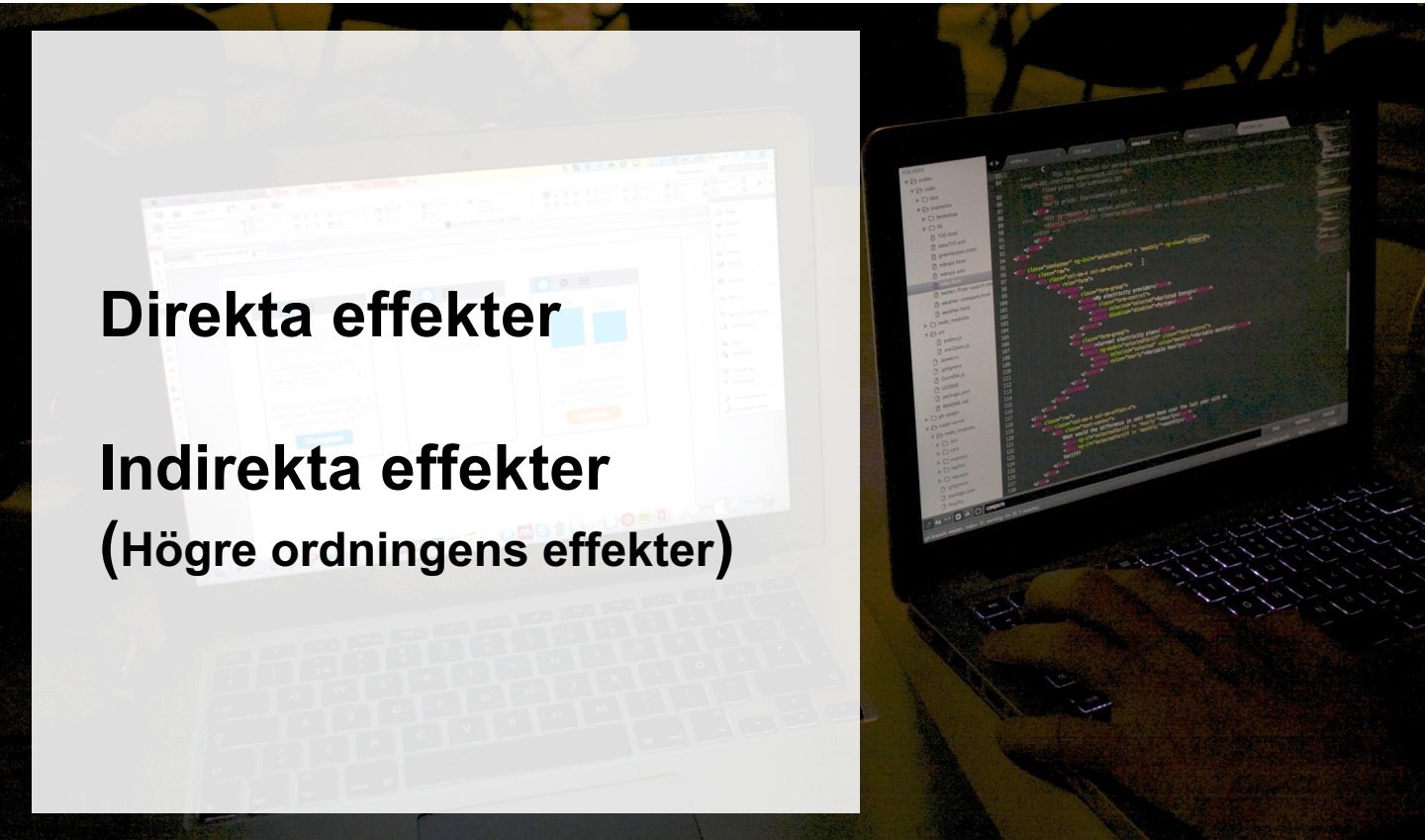
https://www.oxfam.org/en/research/confronting-carbon-inequality-european-union

Ekologiskt fotavtryck



https://www.wwf.se/rapport/living-planet-report/

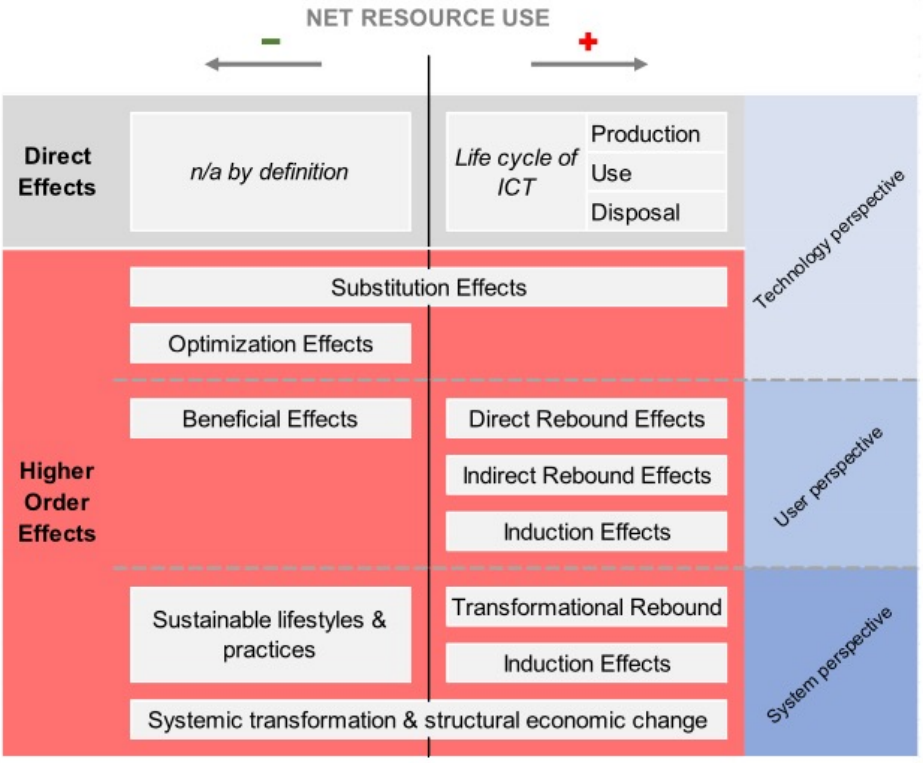
Så, vad har det med IT att göra?



Direkta effekter

Indirekta effekter
(Högre ordningens effekter)

Miljömässiga effekter av IT

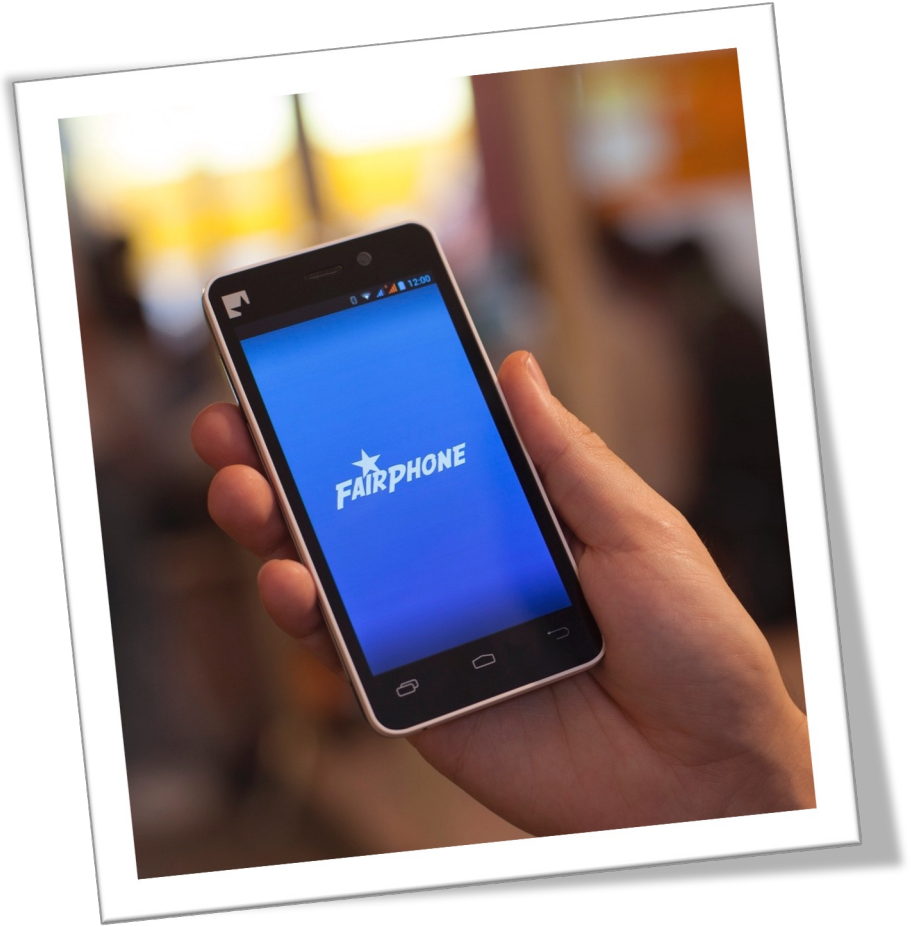


(Pohl et al., 2019)

Direkta Effekter

Material

Produktion


12:00
FAIRPHONE

Energi

Elektroniskt avfall

Användarupplevelse och direkta effekter

Inga förpliktelser
Avsluta online när du vill

Titta var du vill

Välj ditt pris

Titta på serier och filmer när du vill, var du vill – skräddarsytt för dig.

PROVA EN MÅNAD GRATIS

Titta på din tv

Smart-tv-apparater, PlayStation, Xbox, Chromecast, Apple TV, Blu-ray-spelare och många fler.

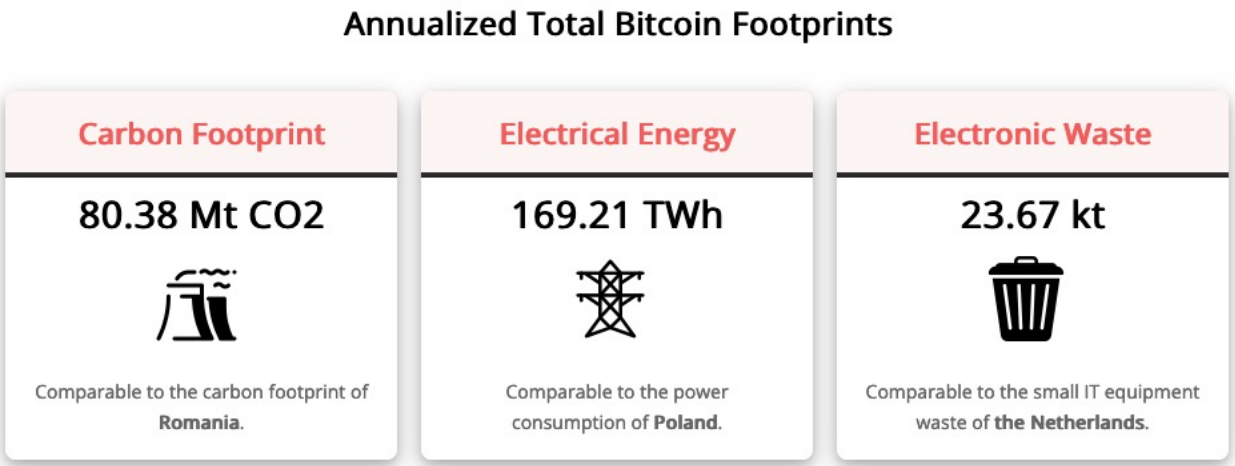
Titta direkt eller ladda ner till senare

Finns på mobil och surfplatta, var du än är.

Med vilken dator som helst

Titta direkt på Netflix.com

Direkta effekter av mjukvara (2021)



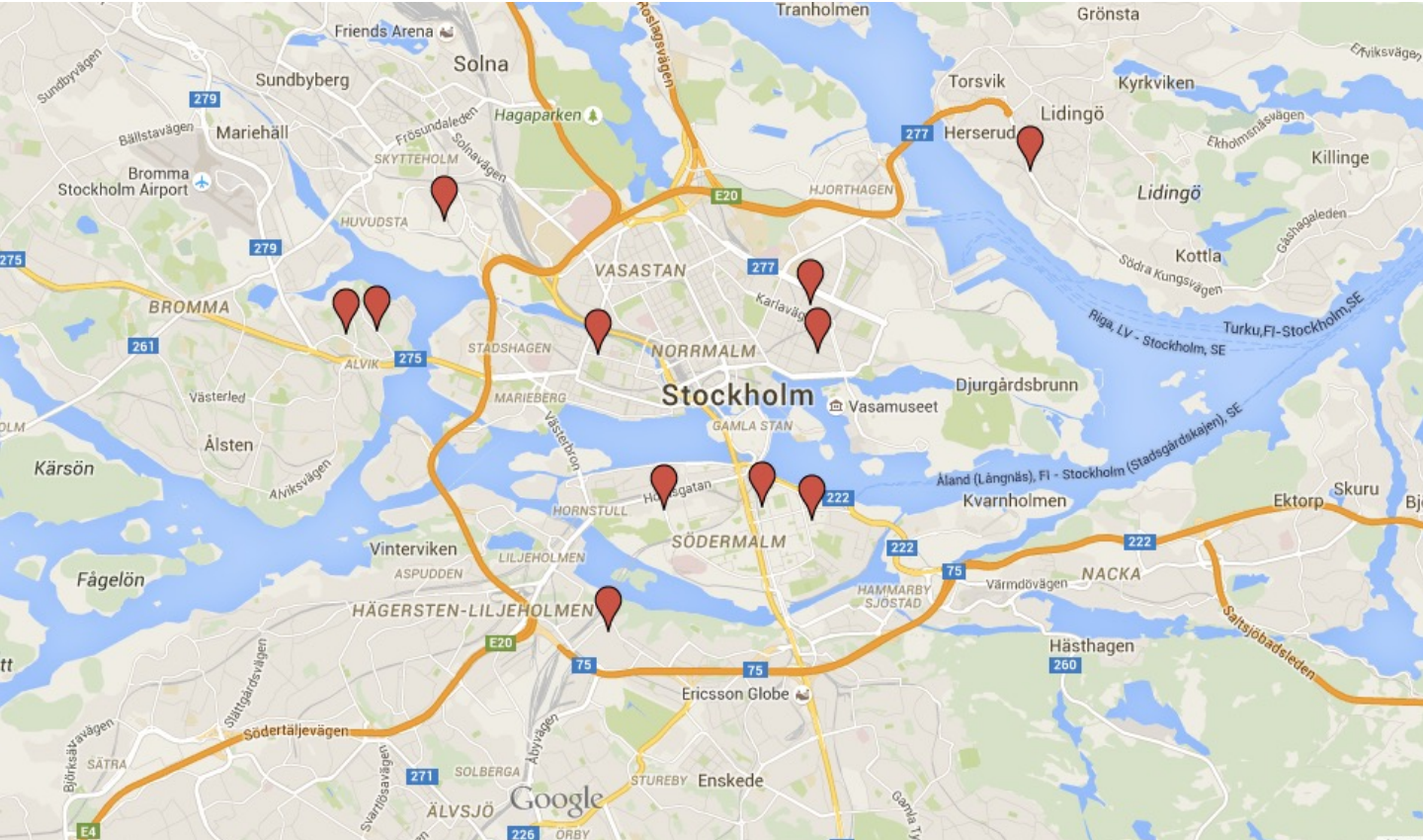
https://digiconomist.net/bitcoin-energy-consumption

IPCC AR6 WGIII
Mitigation of Climate Change

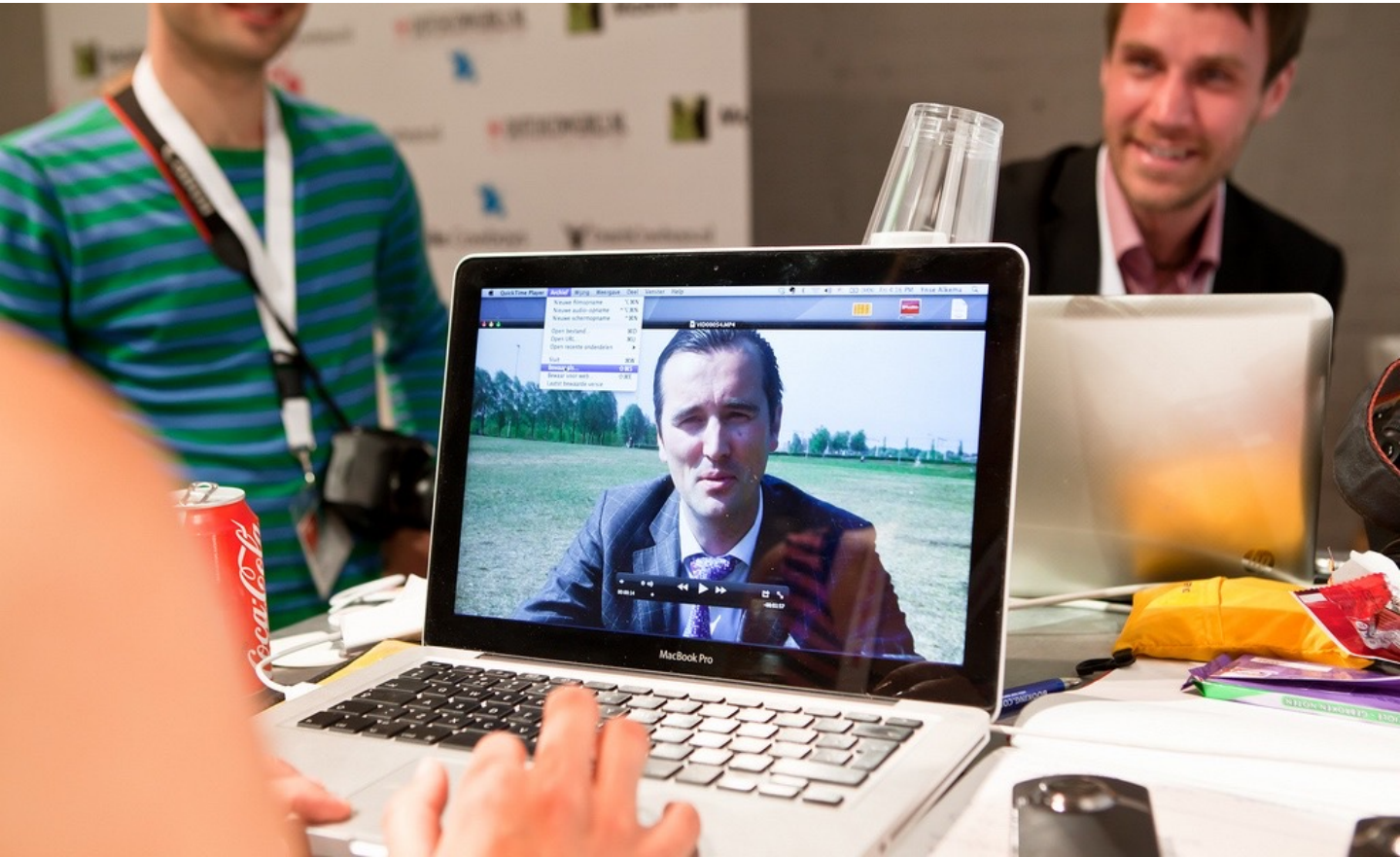
"Digital technologies can contribute to mitigation of climate change and the achievement of several SDGs (*high confidence*). For example, sensors, Internet of Things, robotics, and artificial intelligence can improve energy management in all sectors, increase energy efficiency, and promote the adoption of many low-emission technologies, including decentralised renewable energy, while creating economic opportunities (*high confidence*)."

Indirekta effekter

Optimering


Stockholm
Solna
Friends Arena
Sundbyberg
Mariehäll
Bromma
Stockholm Airport
BROMMA
Hagaparken
SKYTTEHOLM
HUVUDSTA
VASASTAN
NORRMALM
STADSHAGEN
ALVIK
MARIEBERG
GAMLA STAN
Vasamuseet
Djurgårdsbrunn
Tranholmen
Grönsta
Torsvik
Kyrkviken
Lidingö
Herserud
Killinge
Kottla
Södra Kungsvägen
Riga, LV - Stockholm, SE
Turku,FI-Stockholm,SE
Åland (Långnäs), FI - Stockholm (Stadsgårdskajen), SE
Kvarnholmen
Ektorp
Skuru
Västerled
Ålsten
Kärsön
Fågelön
Vinterviken
ASPUDDEN
LILJEHOLMEN
HORNSTULL
SÖDERMALM
HÄGERSTEN-LILJEHOLMEN
HAMMARBY SJÖSTAD
NACKA
Värmdövägen
Hästhagen
Ericsson Globe
Enskede
STUREBY
SOLBERGA
ÄLVSJÖ
SÄTRA
Södertäljevägen
Google

Digitalisering and Dematrialisering



IPCC AR6 WGIII
Mitigation of Climate Change

However, some of these climate change mitigation gains can be reduced or counterbalanced by growth in demand for goods and services due to the use of digital devices (*high confidence*). Digitalisation can involve trade-offs across several SDGs, e.g., increasing electronic waste, negative impacts on labour markets, and exacerbating the existing digital divide. Digital technology supports decarbonisation only if appropriately governed (*high confidence*).

Tack!

Läs mer på: https://www.kth.se/sv/hct/mid/research/sflab/

Referenser

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- Exponential Climate Action Roadmap + 1.5 Business Playbook (https://exponentialroadmap.org/)
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- EAT Lancet report (about healthy and sustainable diet): https://eatforum.org/eat-lancet-commission/
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Referenser med inspiration

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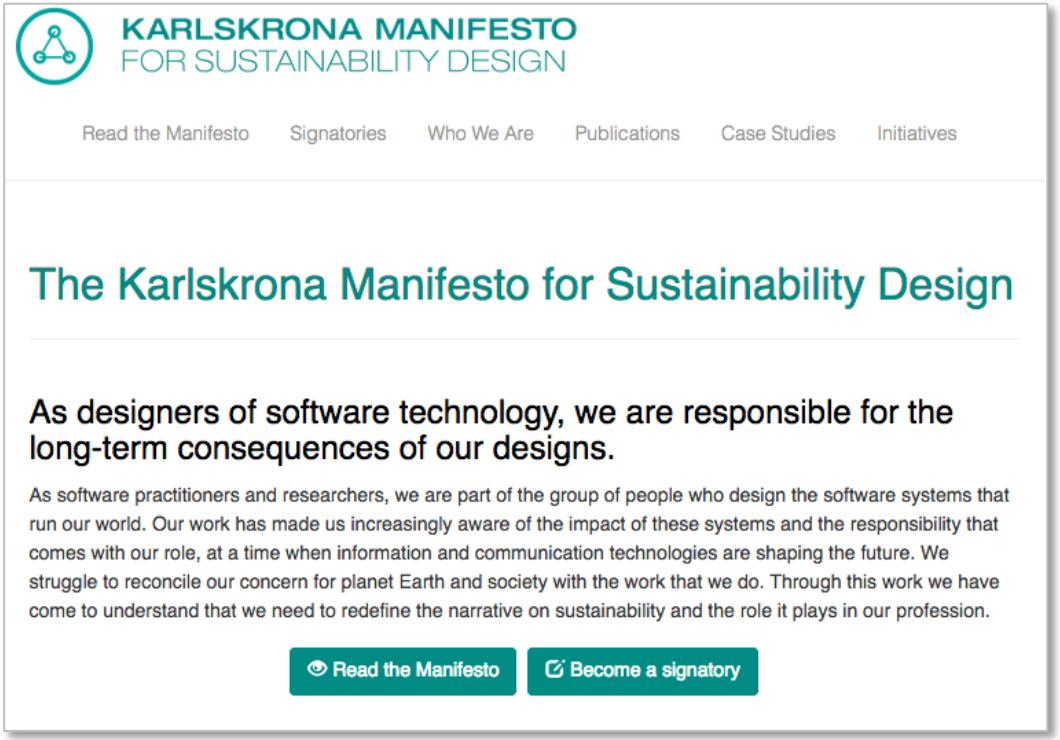
- Fischer, J., & Riechers, M. (2019). A leverage points perspective on sustainability. People and Nature, 1(1), 115-120.
- Donella Meadows: Thinking in Systems
- Jeremy Lent: The Patterning Instinct + The Web of Meaning, great summary in this podcast: https://futurespodcast.net/episodes/52-jeremylent
- Jonna Bonemark: Horsionten finns alltid kvar
- Otto Scharmer: The Essentials of Theory U
- Joanna Macy and Chris Johnstone: Active Hope
- Jem Bendell and Rupert Read: Deep Adaptation



http://sustainabilitydesign.org/