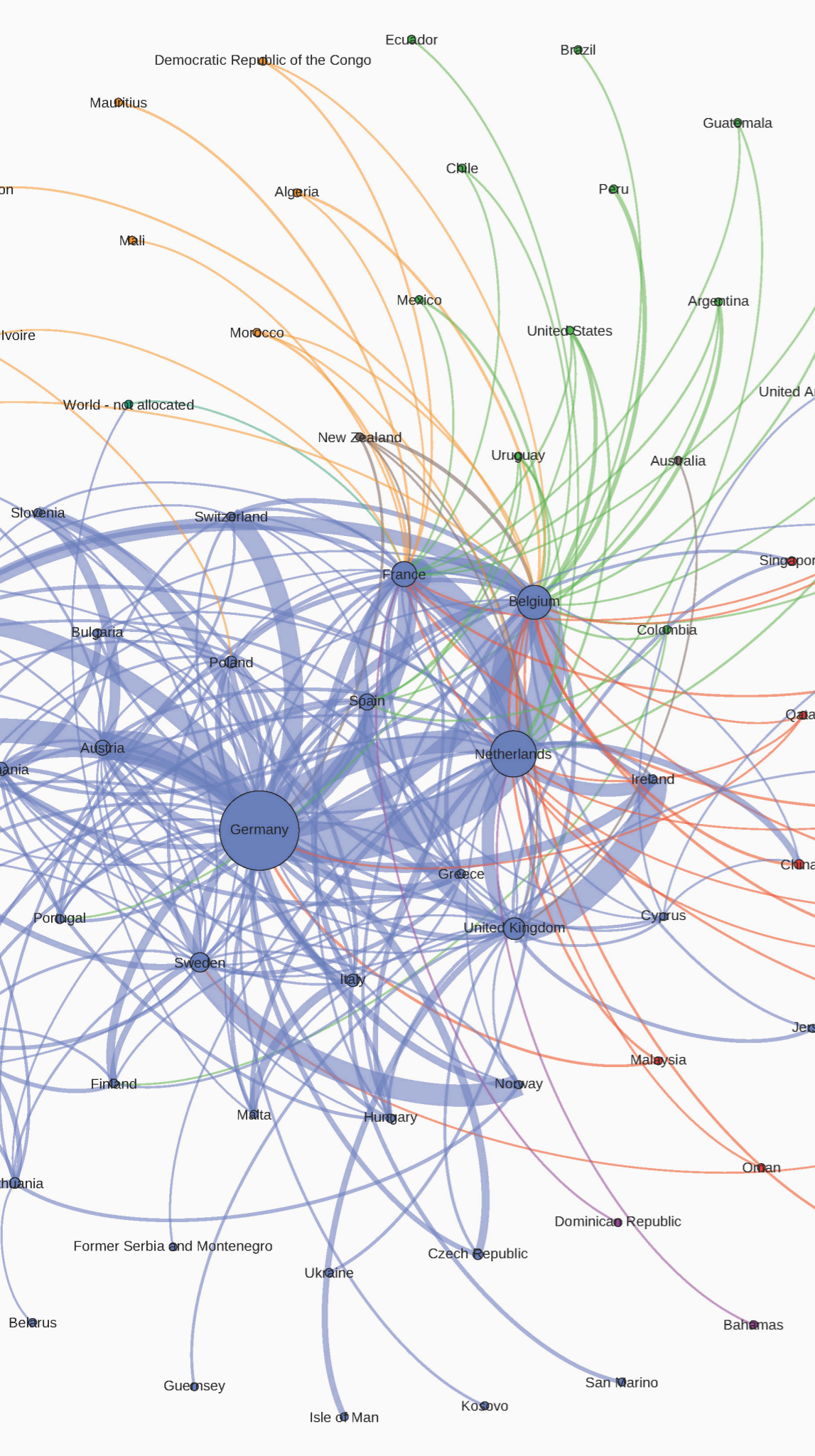


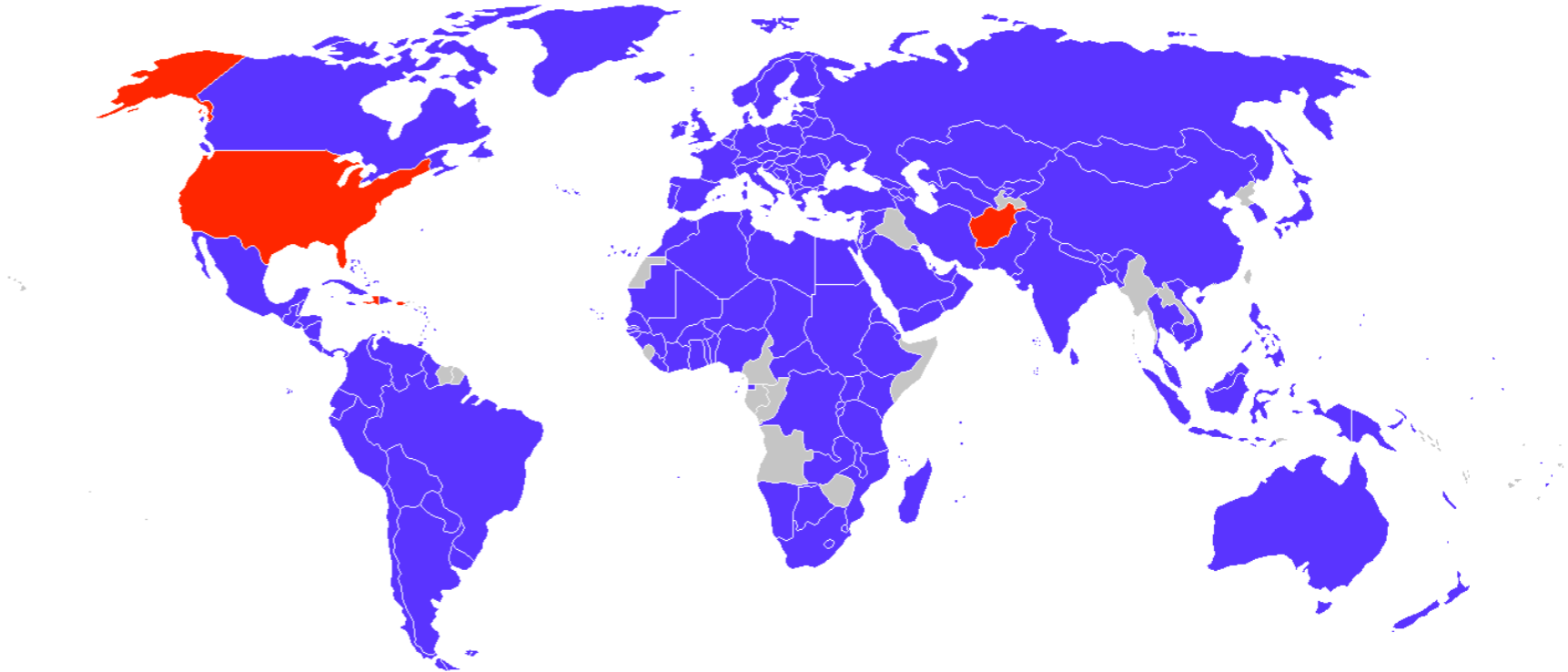
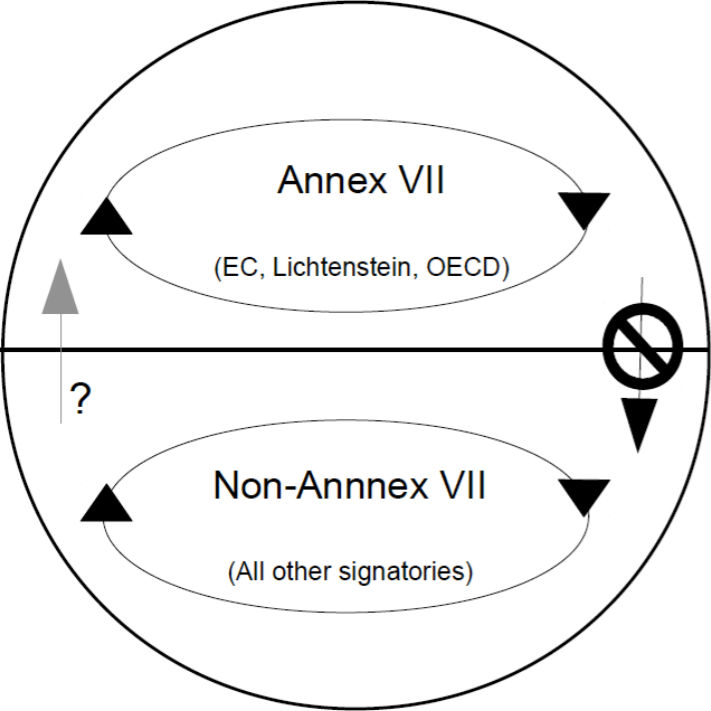
MINING WATCH | TURNING DOWN THE HEAT

Electronic waste: what lessons for the renewable energy sector?

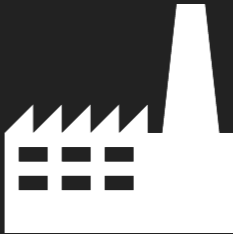
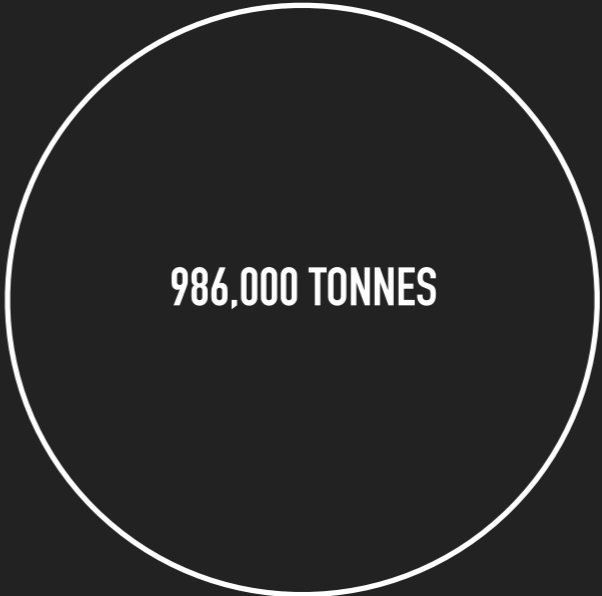


E-WASTE BIG PICTURE

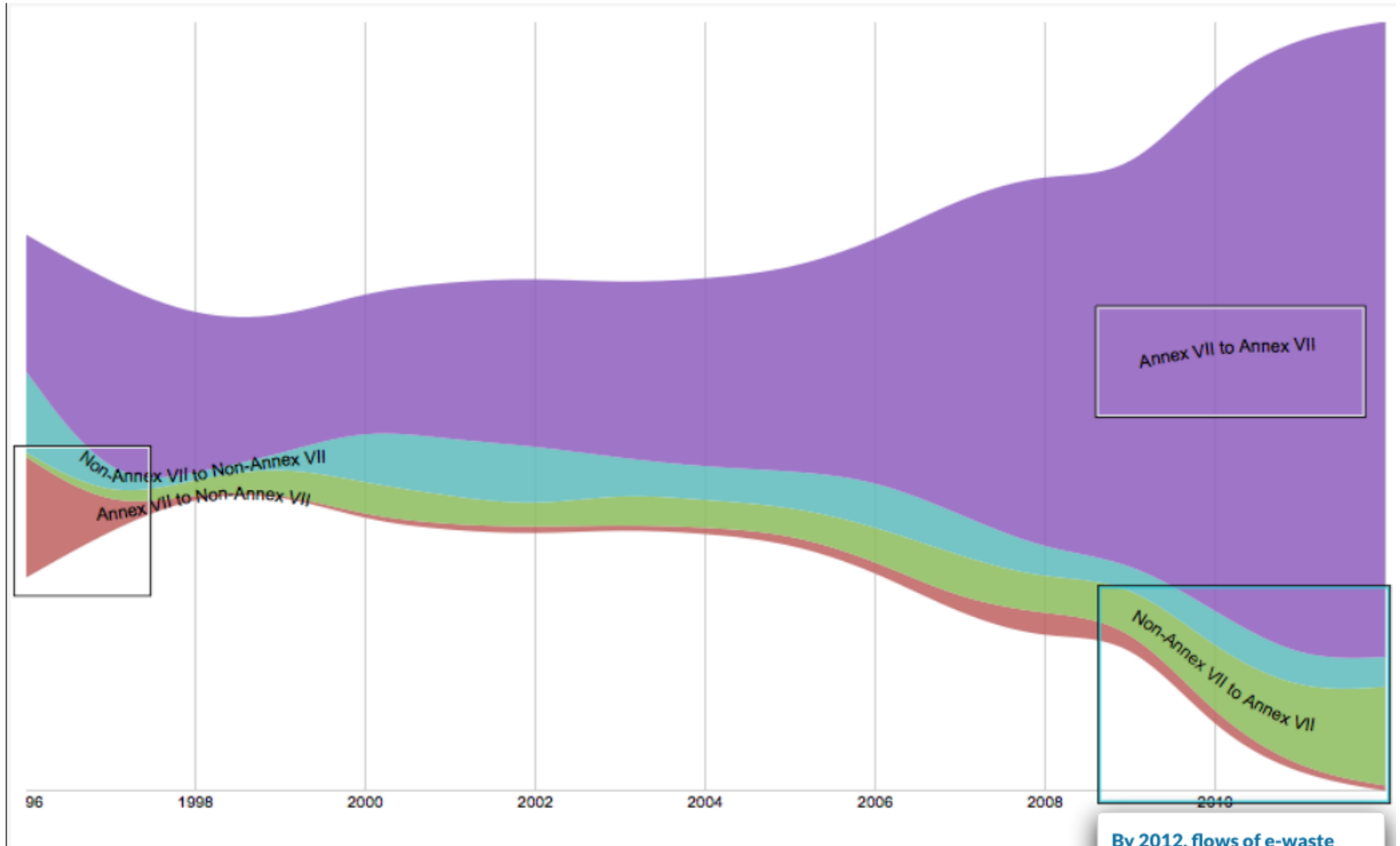
E-WASTE BIG PICTURE



E-WASTE BIG PICTURE



E-WASTE BIG PICTURE



DESCRIPTION ANNOTATIONS DETAILS CITATIONS SOURCE

visualization of the flows of e-waste within and between Annex VII and non-Annex VII territories over time, 1996-2012. The y-axis is

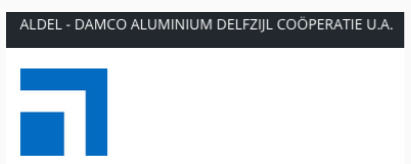
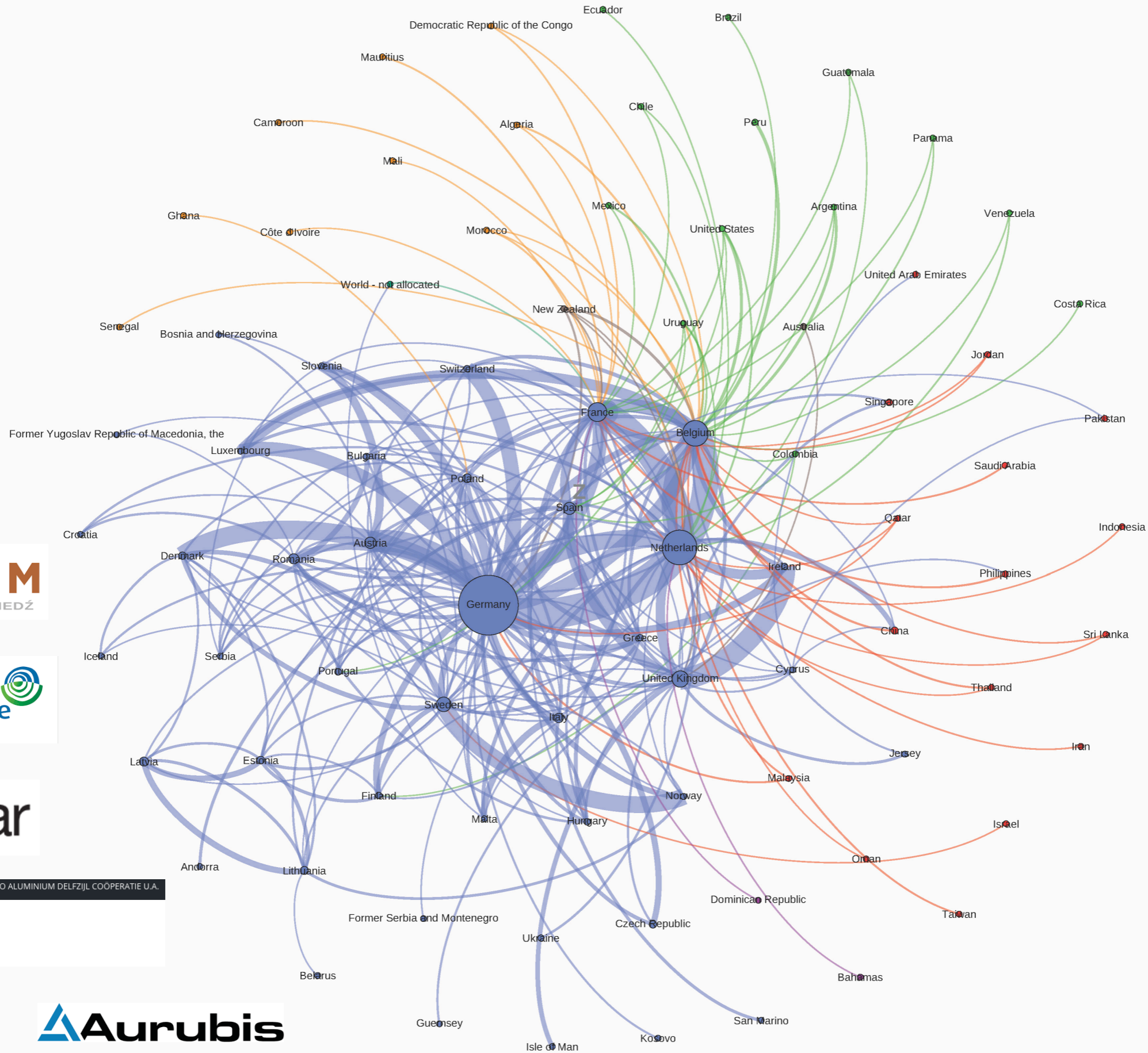
By 2012, flows of e-waste from Annex VII to non-Annex VII countries amounts to less than 1 percent of total trade.



E-WASTE RECYCLING

Lessons and Challenges

LESSONS & CHALLENGES | E-WASTE & URBAN MINING

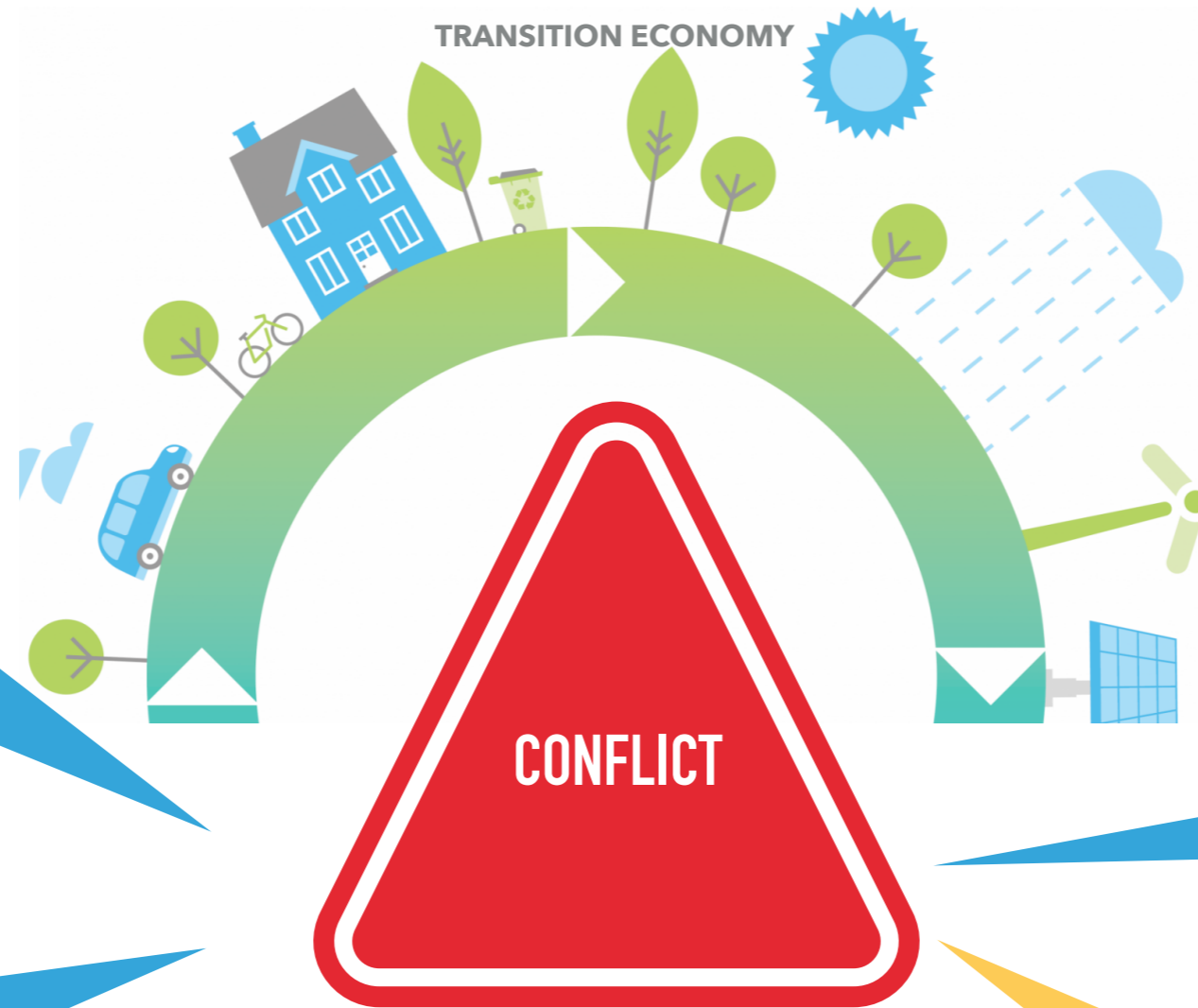




LAWS & POLICY

Lessons and Challenges

LAWS & POLICY | NEED FOR EVIDENCE BASED MATERIALS STEWARDSHIP



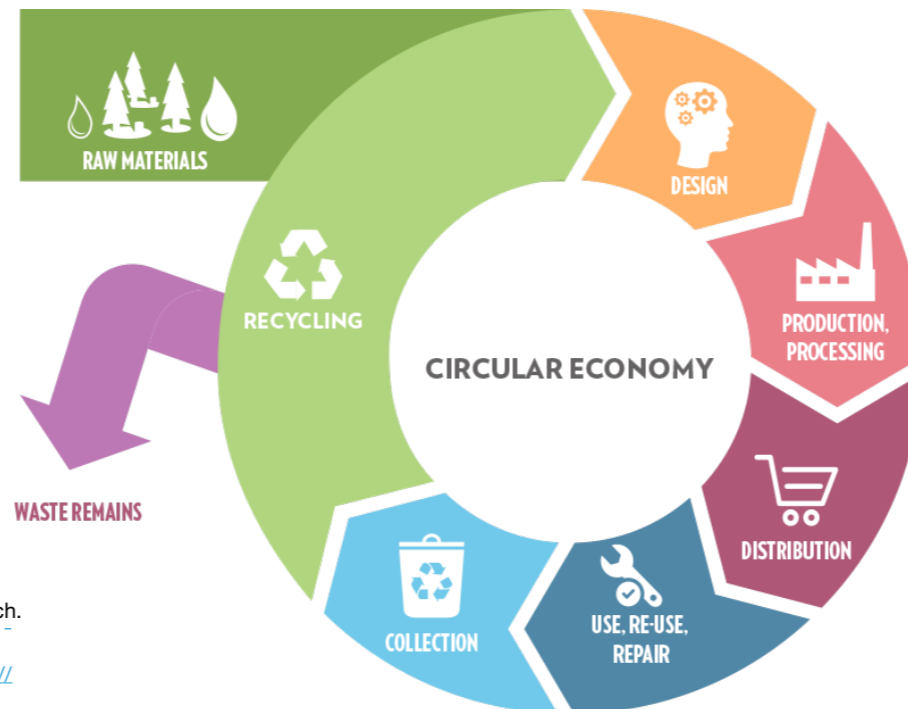
Short to medium term need for mining.

Need for general policy principle: evidence based materials stewardship

Not enough of right materials in existing infrastructure to enable transition and circling.

e.g., lithium, cobalt, REEs

Indigenous sovereignties? Green colonialism?

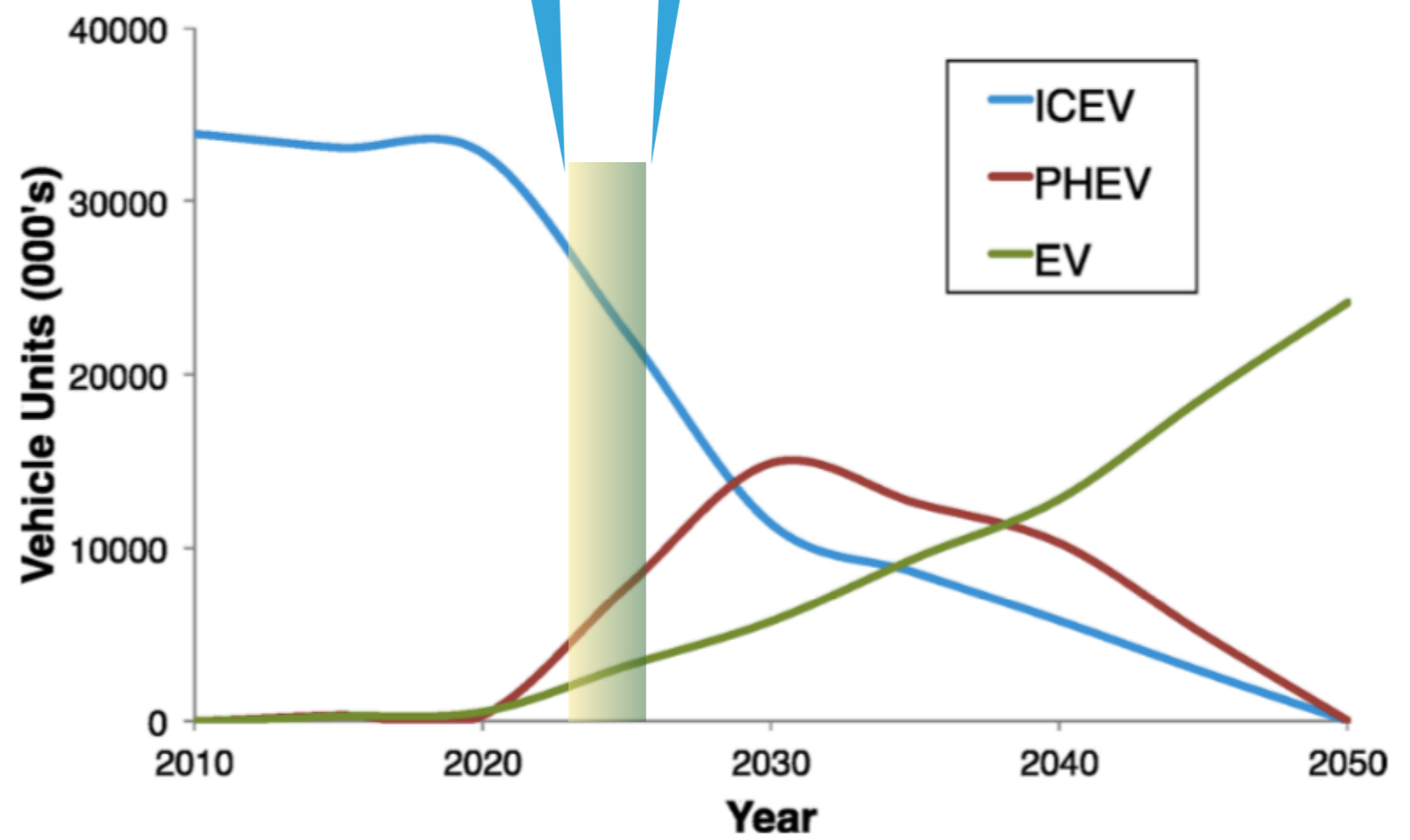


LAWS & POLICY | NEED FOR EVIDENCE BASED MATERIALS STEWARDSHIP



Materials management policy supporting Li-ion battery recycling infrastructure & logistics in place c. 2025.

Materials management policy stipulating design for reuse of NdFeB motor magnets c. 2025.

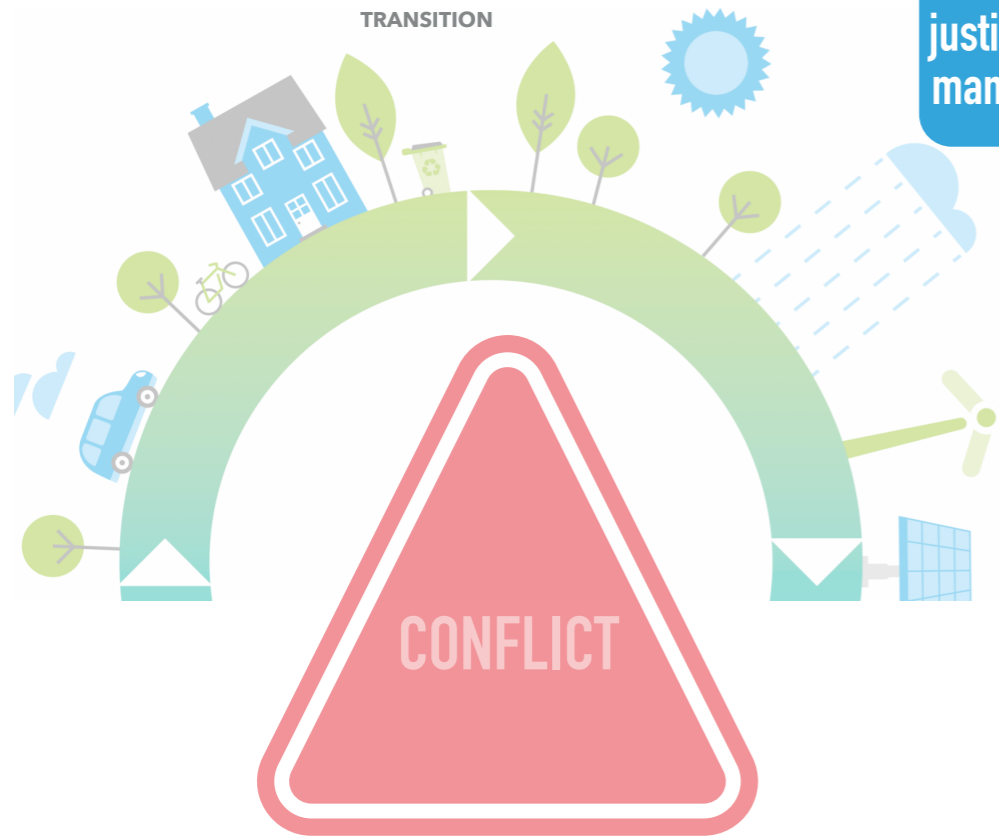


Reduced demand for primary mining

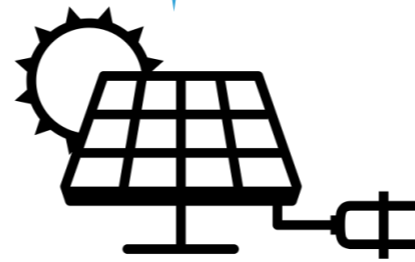


Busch, Jonathan, Julia K. Steinberger, David A. Dawson, Phil Purnell, and Katy Roelich. "Managing Critical Materials with a Technology-Specific Stocks and Flows Model." Environmental Science & Technology 48, no. 2 (January 21, 2014): 1298–1305. <https://doi.org/10.1021/es404877u>

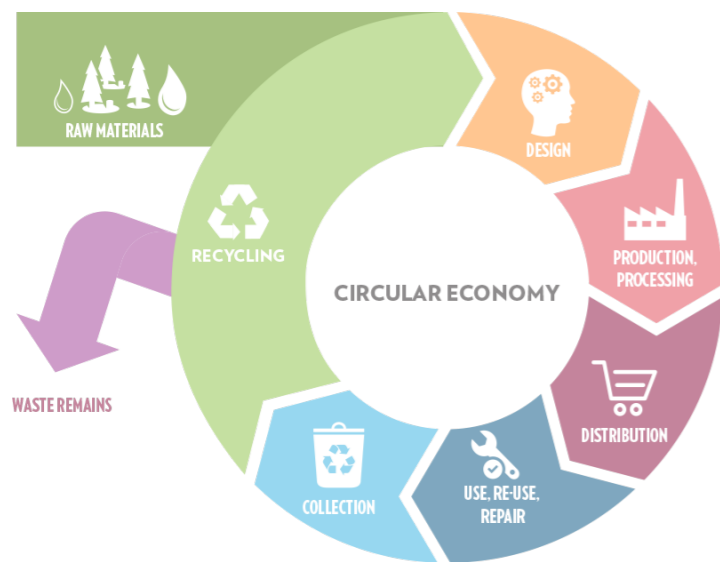
LAWS & POLICY | NEED FOR EVIDENCE BASED MATERIALS STEWARDSHIP



Generalized reduction in demand for material X or Y doesn't automatically achieve environmental and economic justice e.g., Cd pollution from solar PV manufacturing.



Created by sandra from Noun Project

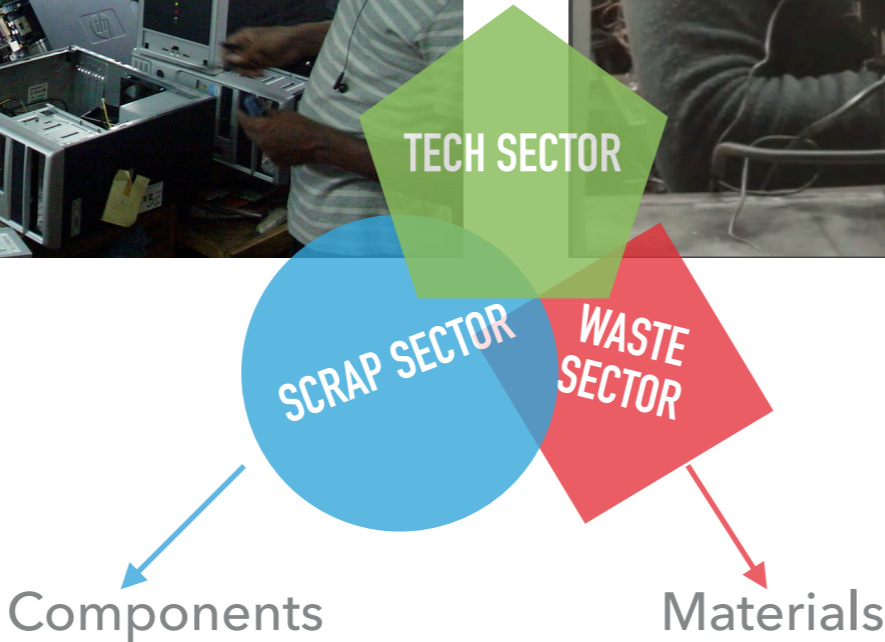


Metrics (e.g., LCA) measuring transition and circularity should aim for "humility". Environmental and economic justice for whom? Where? When? Under what conditions?



FAIR TRADE RECYCLING / E-WASTE 'OFFSETS'

Price premium for reusable & repairable devices traded for mass balance of locally relevant scrap/waste



LAWS & POLICY | IMPLICATIONS OF BROAD GEOGRAPHICAL SHIFT?



"rural", "distant", "remote"

Need for general policy principle:
evidence based materials
stewardship?

Indigenous sovereignties?
Green colonialism?

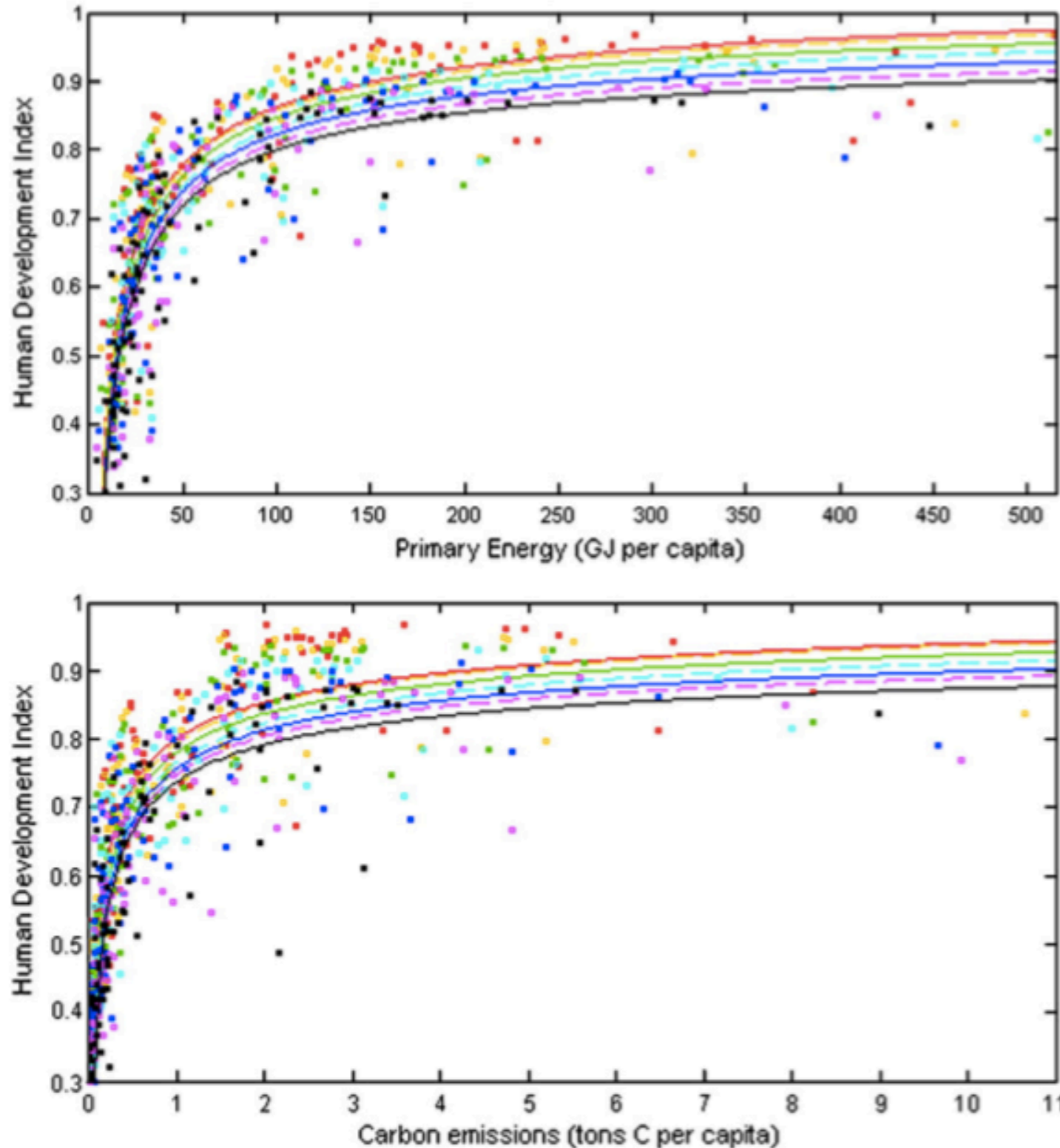
"urban", "close", "core"

TECH SECTOR

SCRAP SECTOR

WASTE SECTOR

LAWS & POLICY | EFFICIENCY TO SUFFICIENCY

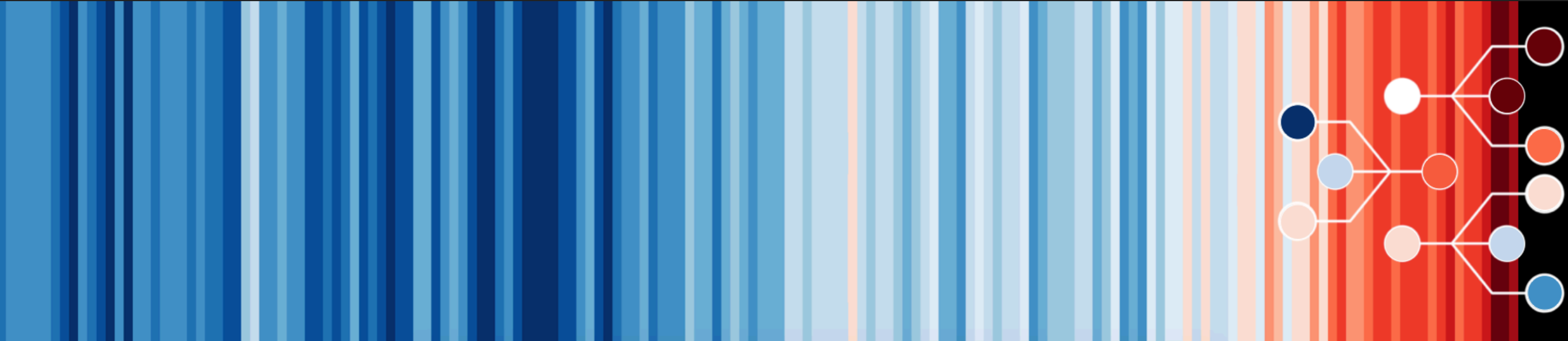


The social equity and sufficiency goals of sustainable energy development may be within reach at bearable environmental costs: globally, the total amount of primary energy currently consumed is now more than sufficient to attain high human development for all.



Dr. Julia K. Steinberger

Rather than biophysical or technical limits, then, the solutions to energy over-use and under-development now are mostly constrained by economic and political structures.



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