



Nils, Jessica

# Dynamic ScaLCA

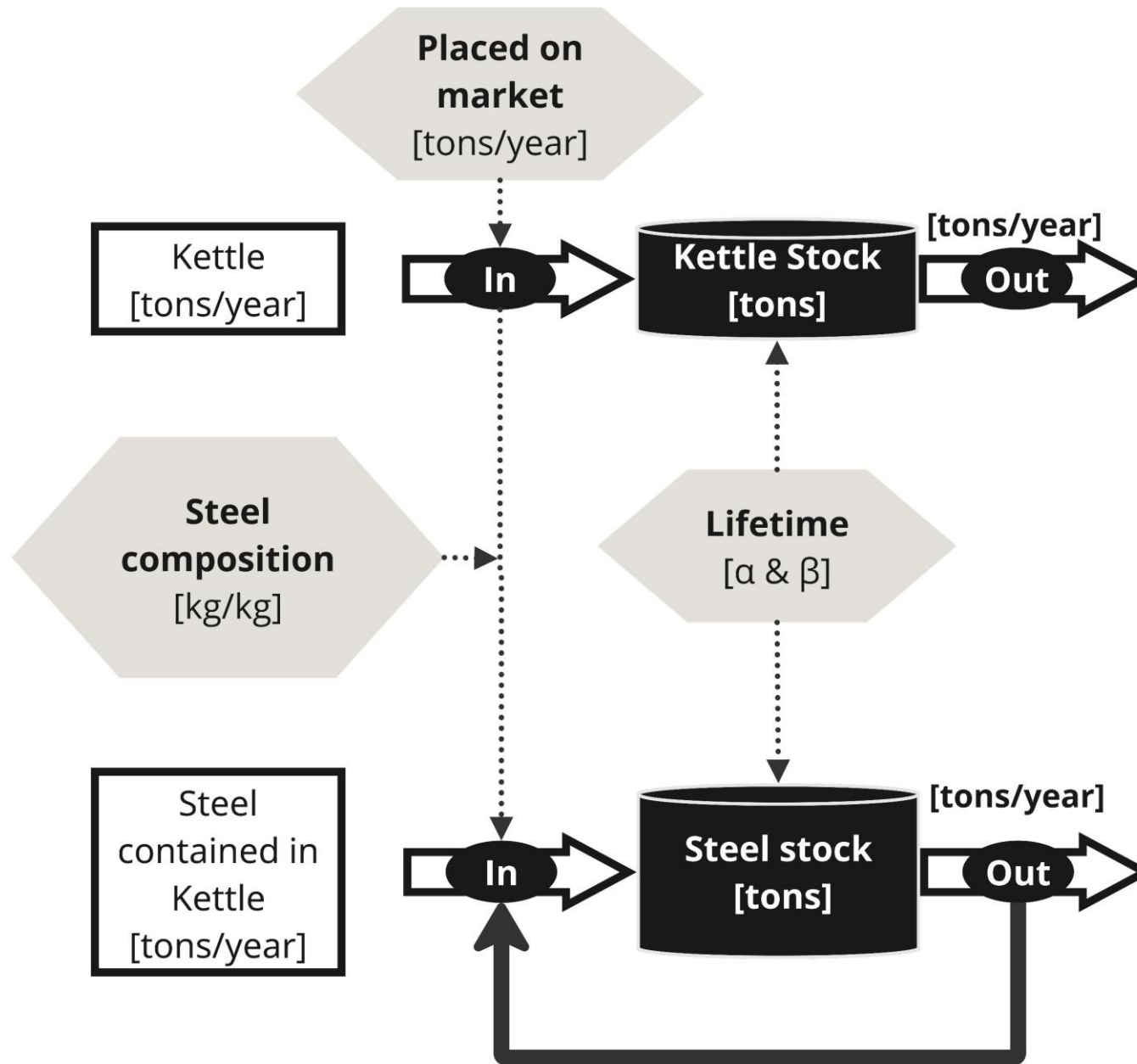
Seungil, Pablo

# Research interest

- The circular economy not only reduces material demand, it also reduces environmental impacts...
- Does it? Over time...?
- Framework to quantify the environmental impacts of circularity interventions



# MFA



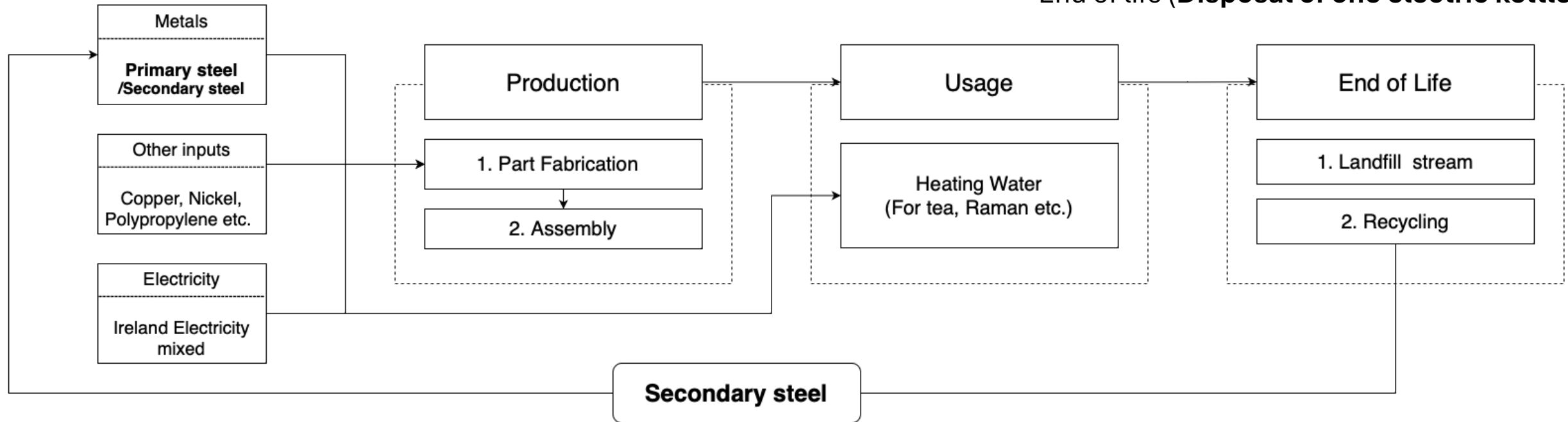
# LCA

## [Functional Unit]

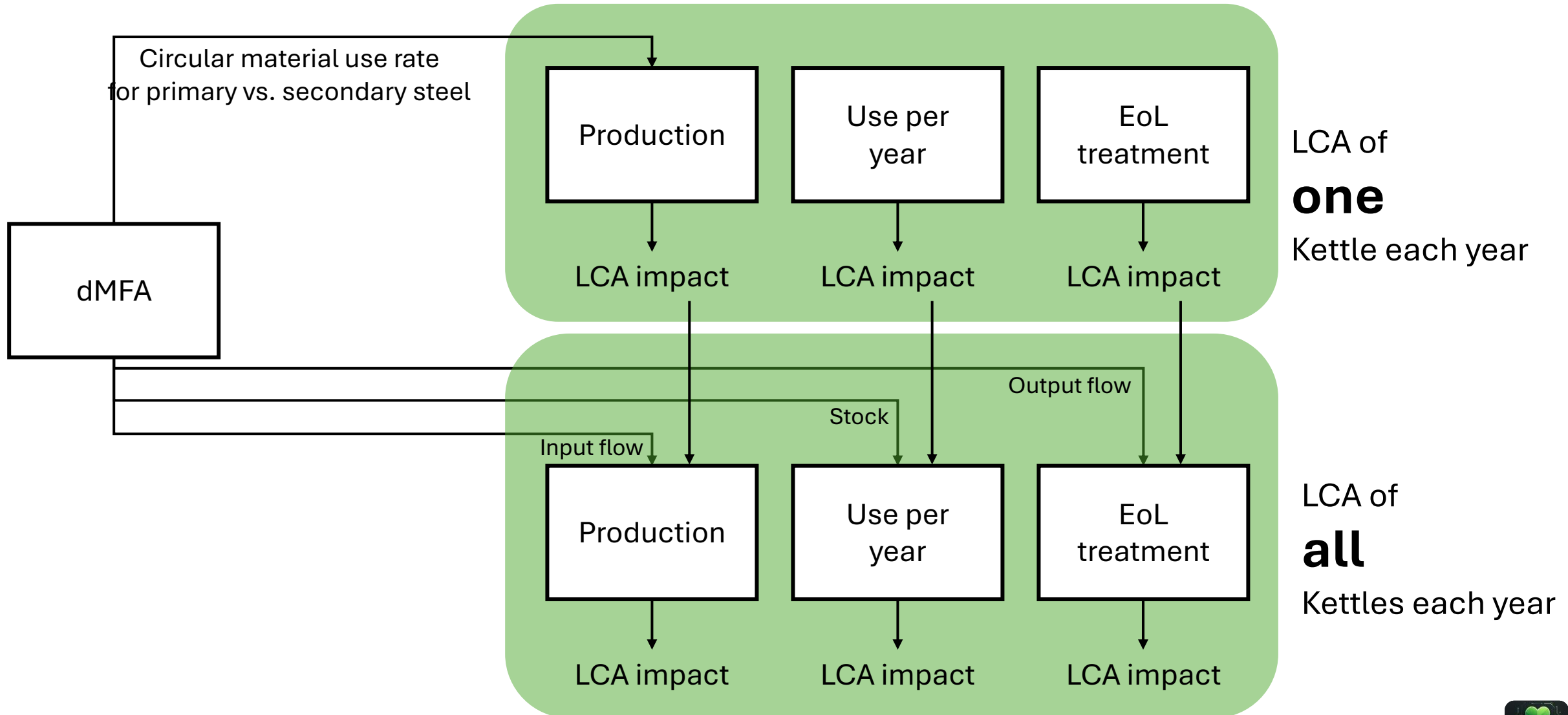
Production (**one electric kettle**)

Usage (**One year of one electric kettle use**)

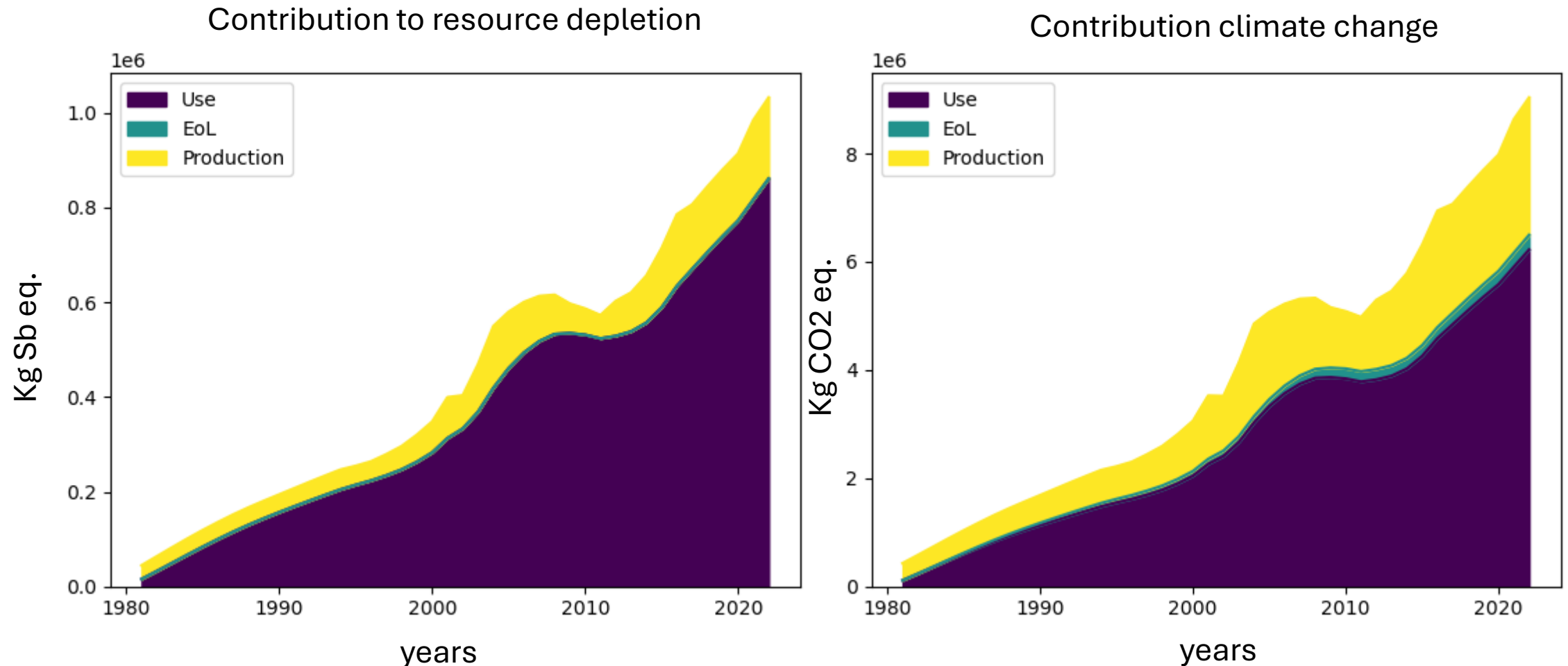
End of life (**Disposal of one electric kettle**)



# LCA dMFA Integration



# Contribution of life cycle phases

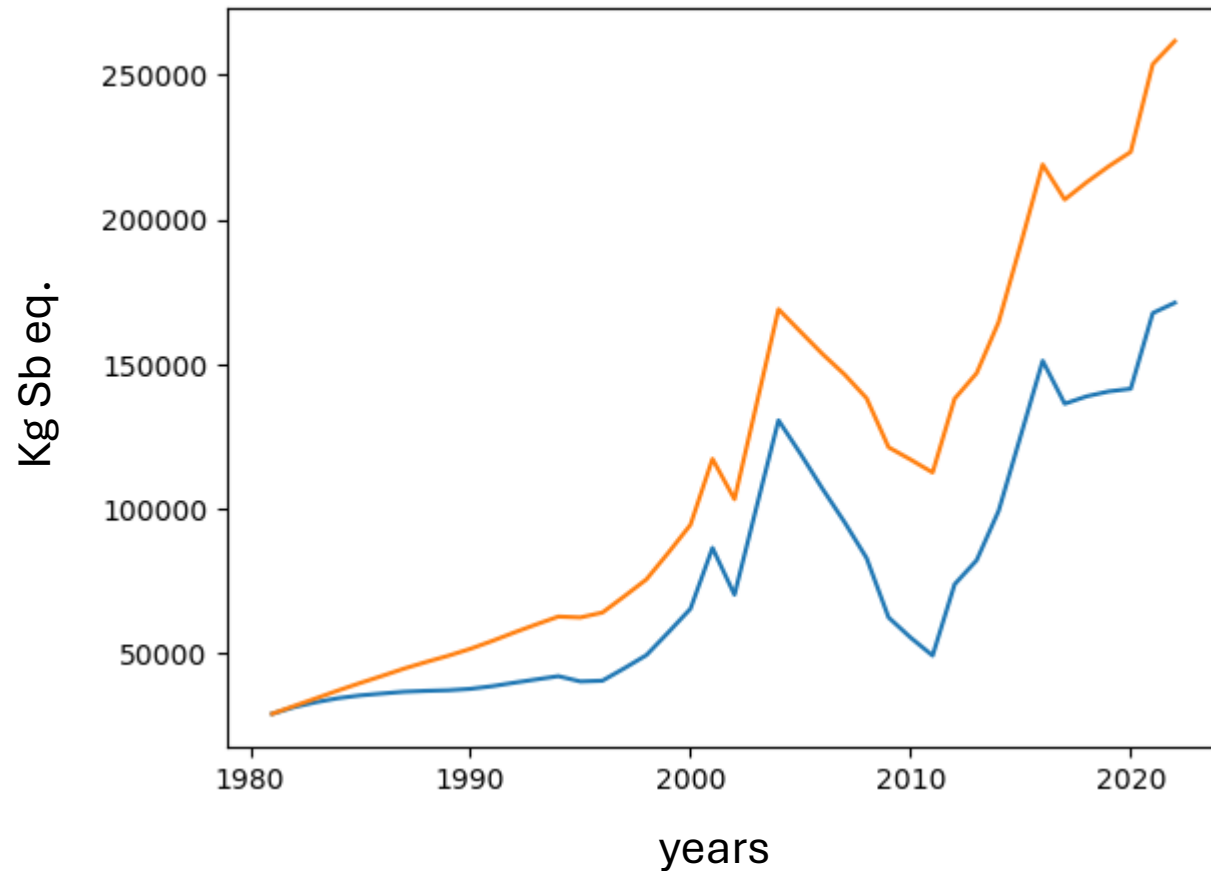


Using max available secondary steel @ 80% recycling

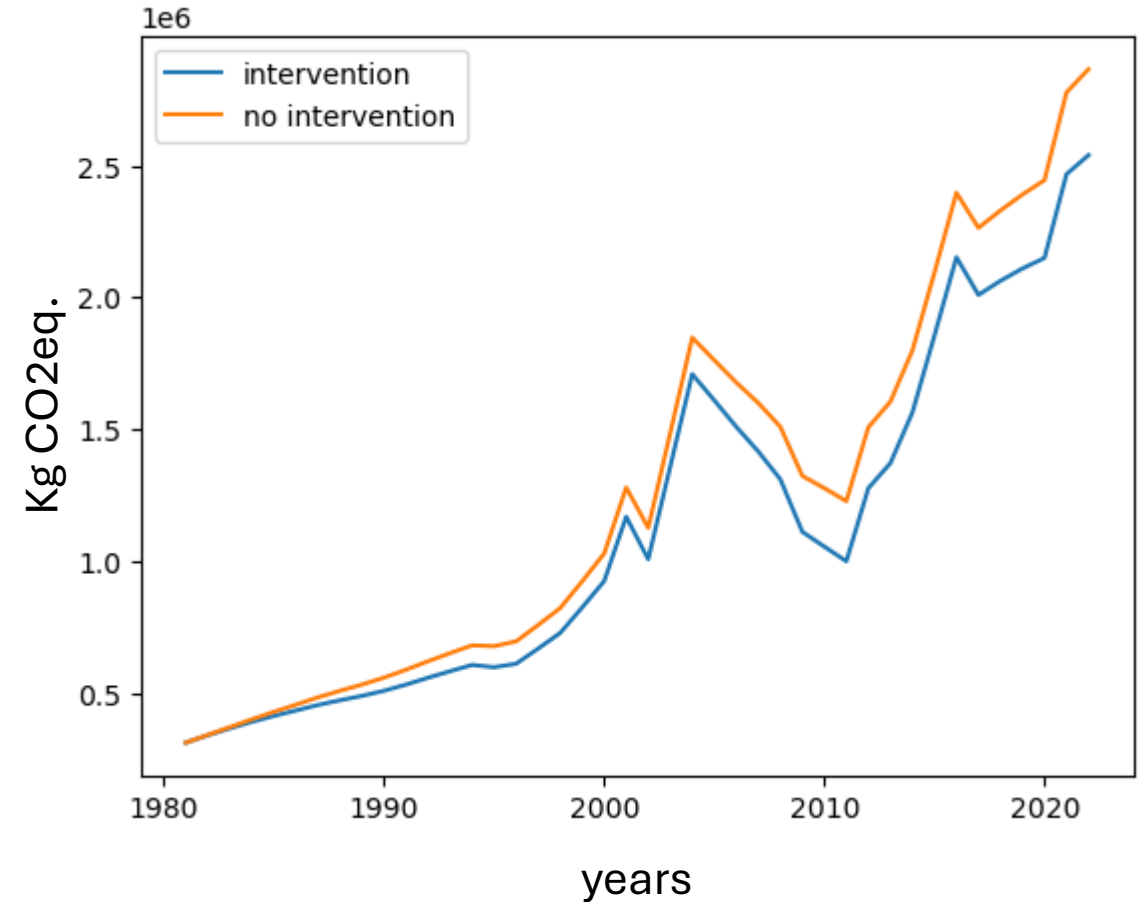


# Impacts over time

Contribution to resource depletion



Contribution climate change



Using max available secondary steel @ 80% recycling



# Possible research applications

- Quantifying environmental impacts of material replacement or reduction over time
- Incorporating multiple product systems to explore cross-feeding of recovered materials
- Efficiency improvement of new products vs. lifetime extension
- ...





# Possible future additions

- More modelling options
  - EOL collection rates [MFA]
  - Expanding material reduction or replacement to more materials [MFA/LCA]
  - Lifetime extension [MFA]
  - Changing energy mixes [LCA]
  - Essentially all parameters of an LCA and a dMFA...
- More assessment options
  - Impact contribution analysis over time [LCA over time]

