

Carbon neutrality and LCA: Challenges of offsetting accounting and possible solutions

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- Carbon neutrality claims

- Products
- Organizations
- Countries



ClimatePartner
certified product

climate-id.com/000001 [1]



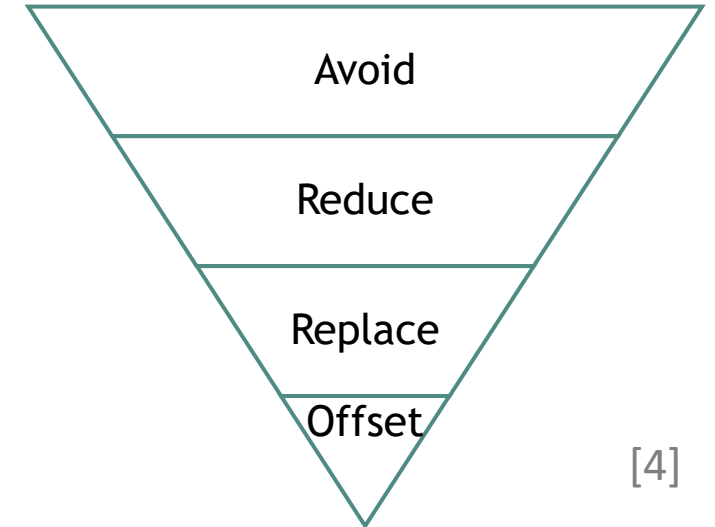
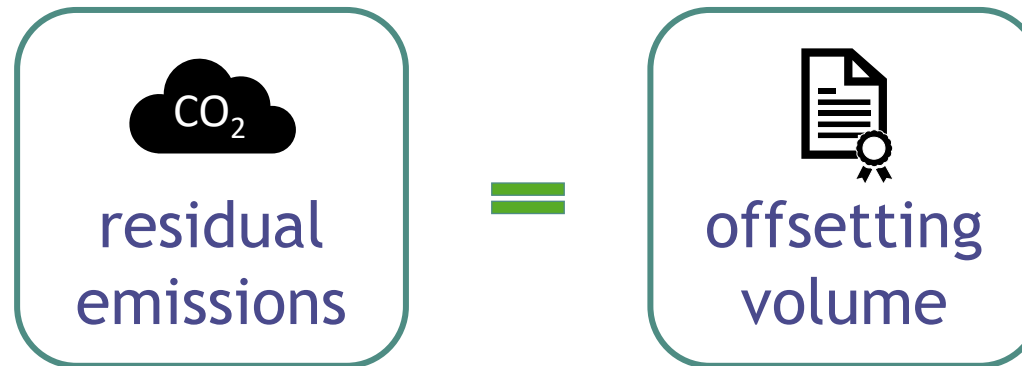
- City of Melbourne is carbon neutral since 2012, Brisbane since 2016/17

↳ What does it actually mean?





- Net zero emissions
- Mitigation over compensation hierarchy:
 - Reduction priority
 - Compensation necessity
- General rule:



↳ How to calculate both emissions and offsets?



- Emissions and emission reduction



- ✓ Life cycle assessments
- ✓ Carbon footprint of products
- ...



[5]



GREENHOUSE
GAS PROTOCOL [6]



European
Commission

[7]

- Compensation (offsetting)



- ?



... compensate for emissions

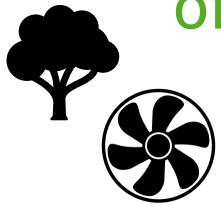


Offsets

... are traded on the carbon markets



... are generated through
offsetting projects



... certified through
offsetting programs



[8]

... define quality criteria

- permanence
- double counting
- leakage
- monitoring
- ...



Results of literature review:

- Clear and consistent calculation rules are missing
- Risk of **overestimation** of credits
- Standards define **criteria** differently
 - E.g., time horizon defined as permanent
- Project developer can choose **methodology**
 - E.g., different carbon pools are considered
- Credits result from different **project types**
- ...



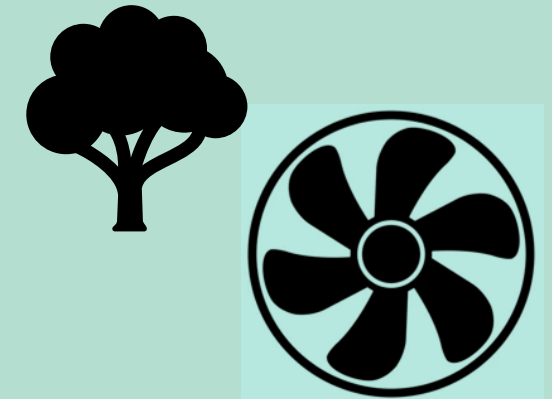
Avoidance projects

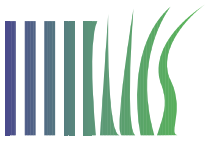


Reduction projects



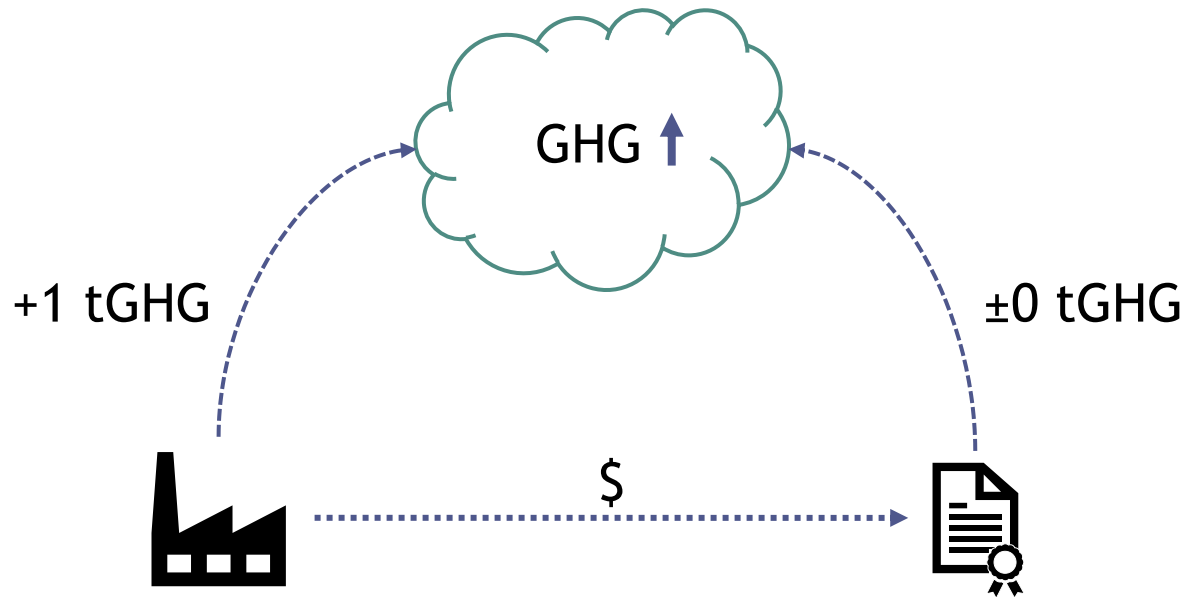
Removal projects





Avoidance projects:

- **Prevent** GHG emissions compared to a reference scenario
- Protect certain natural areas
- E.g., prevented deforestation or wetland protection

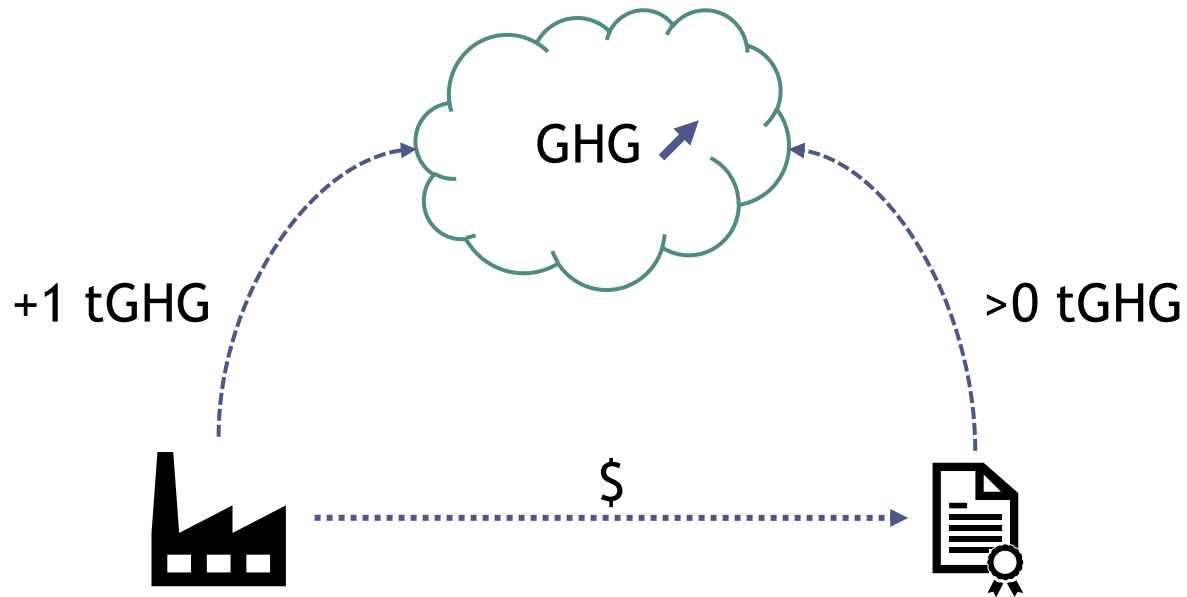


[7]



Reduction projects:

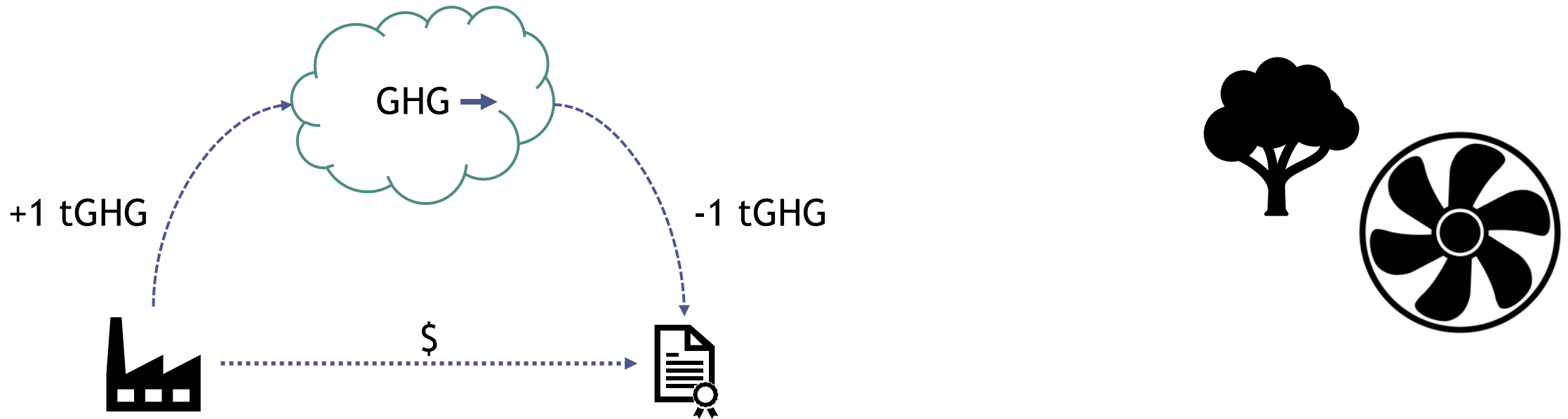
- **Reduce** GHG emissions compared to the reference scenario
- Lower-emission alternatives or adaptations
- E.g., clean cookstoves, renewable energy

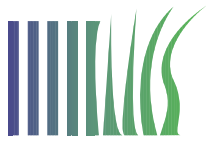


[8]

Removal projects:

- **Sequester** GHG from the atmosphere and store it geologically or biologically
- Negative emission technologies (NETs)
- E.g., afforestation, direct air carbon capture and storage (DACCS)





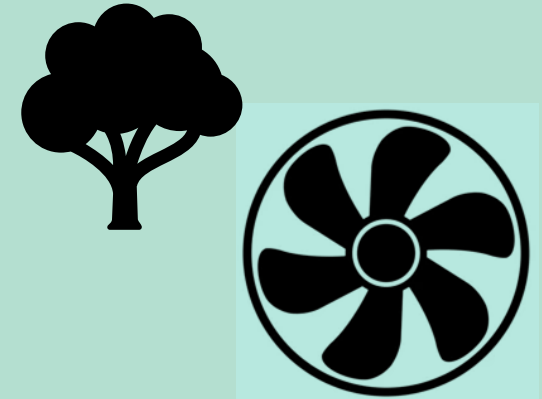
Avoidance projects



Reduction projects



Removal projects



GHG ↑

>80%

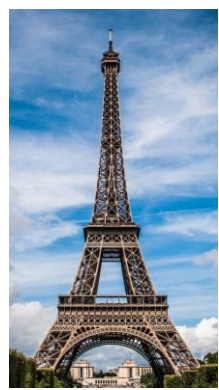
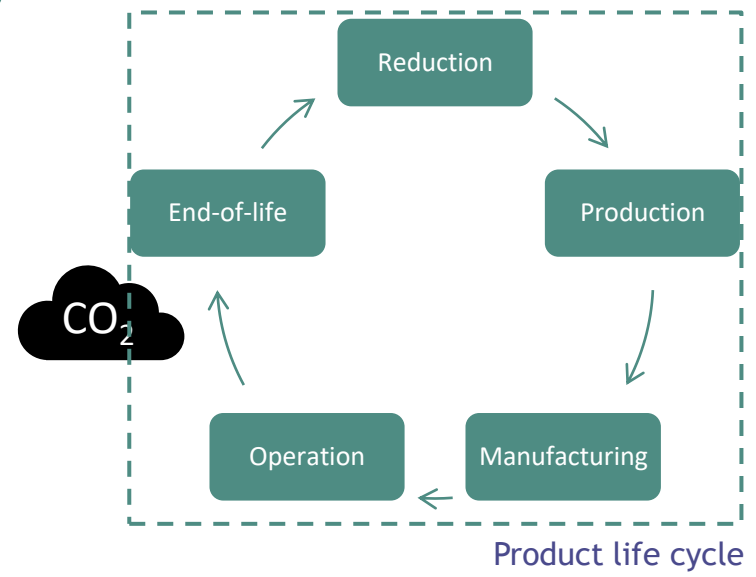
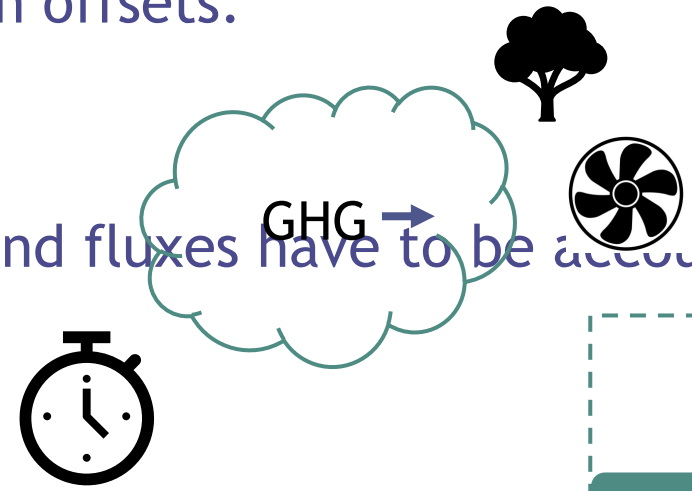
GHG ↗

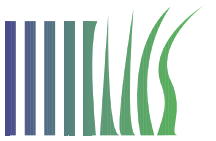
GHG →



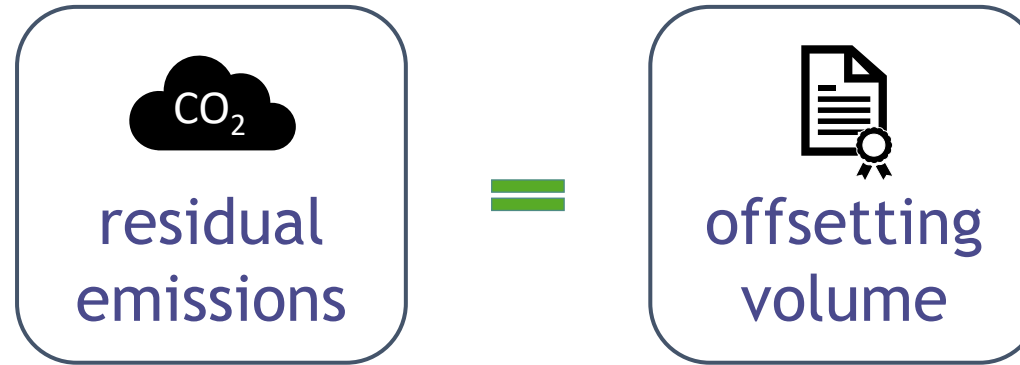
Suggestions to improve quality of carbon offsets:

1. Only **NETs** count as offsets
2. **All** life cycle stages, carbon pools, and fluxes have to be accounted for
3. The removal has to be **permanent**
4. Good practice is applied
5. The focus is on **GHG** and not on overall sustainability
6. Additionality is redundant





Carbon neutrality:



- Suggested offsetting principles could improve quality of offsets
 - Basis for offsetting standard
 - Product category rules (PCR)
 - How to define the functional unit?
 - How to deal with permanence?
 - ...

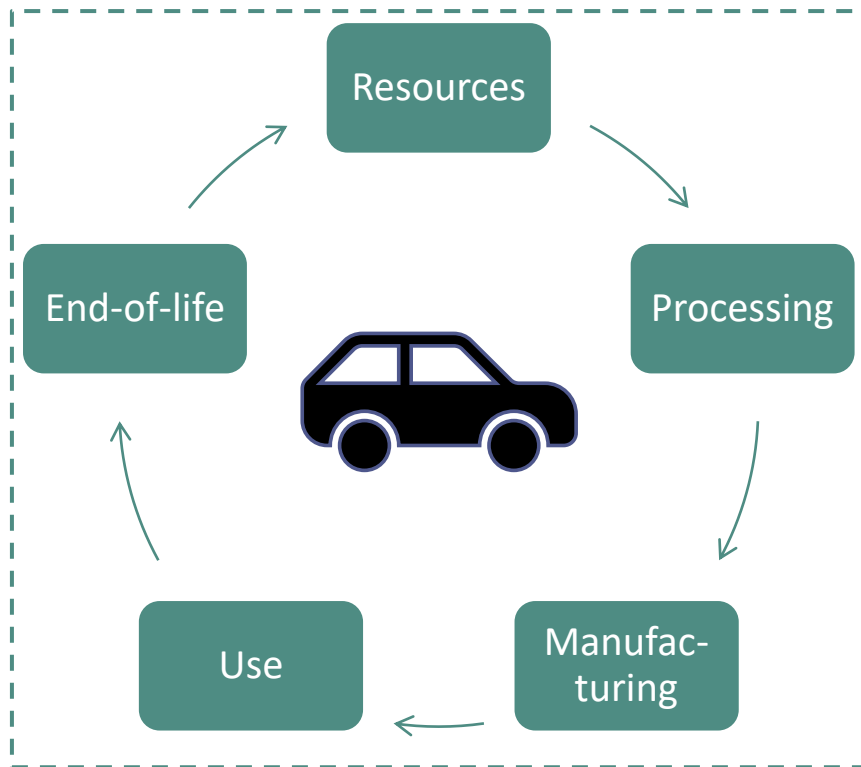


[9]



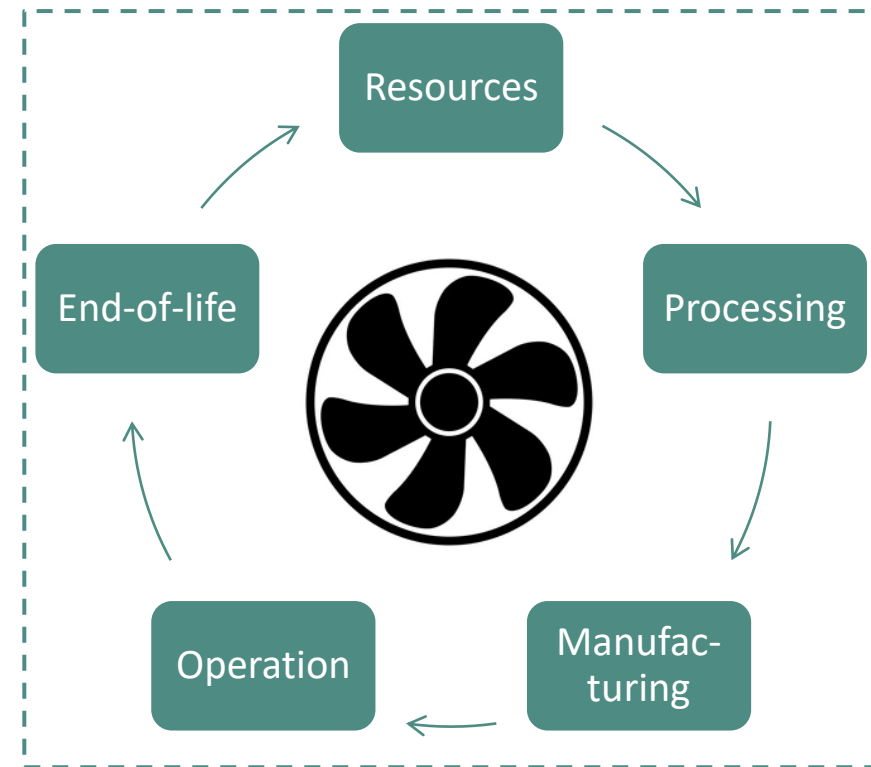
Product, e.g., car

“Provide 250,000 pkm of mobility”



NET-Offset*, e.g., DACCS

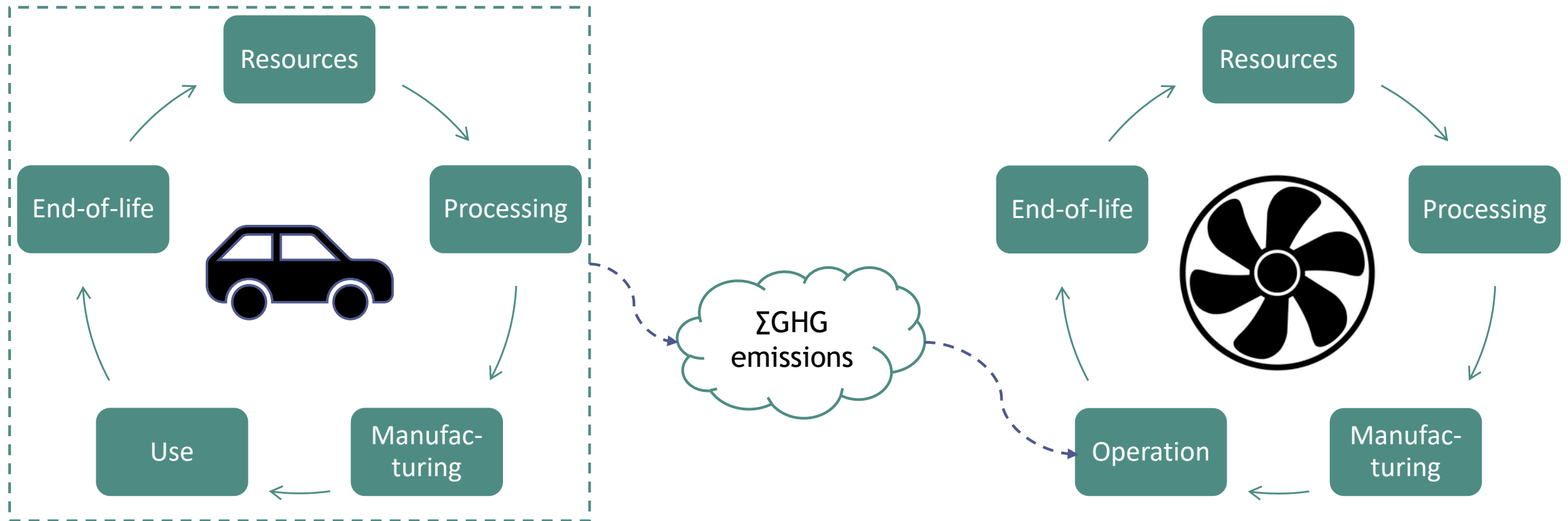
“Remove 100 tGHG”



*Emissions < removal



- End-of-life allocation
 - NET as waste treatment plant



Thank you for your attention!

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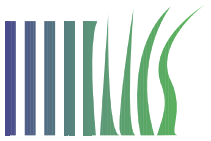
<https://www.linkedin.com/in/elena-huber-128676203>



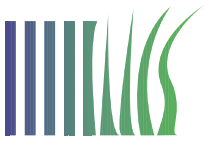
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