VAN DER HOEVEN

Horticultural projects

Van Der Hoeven

We develop turn-key, high-tech and circular greenhouses

for **sustainable food production - since 1953**

Advisory **Design** **Build** **Operate**

Van der Hoeven, Sundrop Farms Aus

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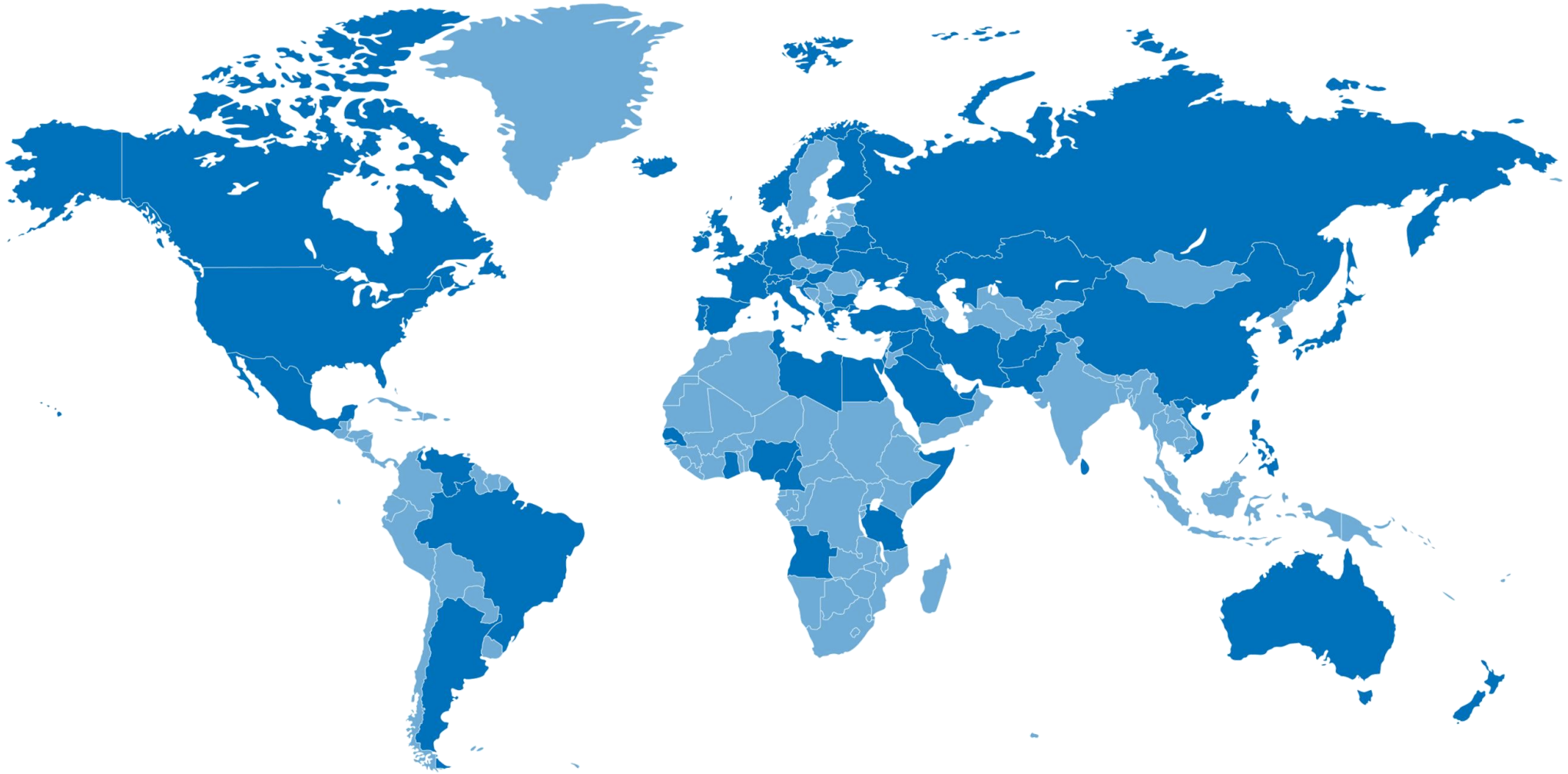
Projects



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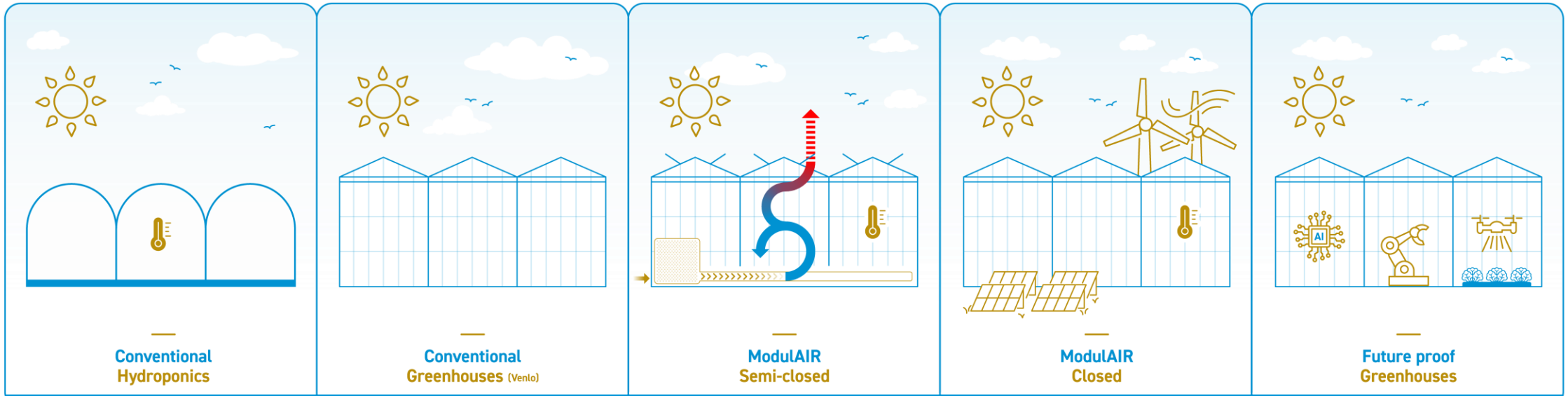
Greenhouses: from low to high-tech

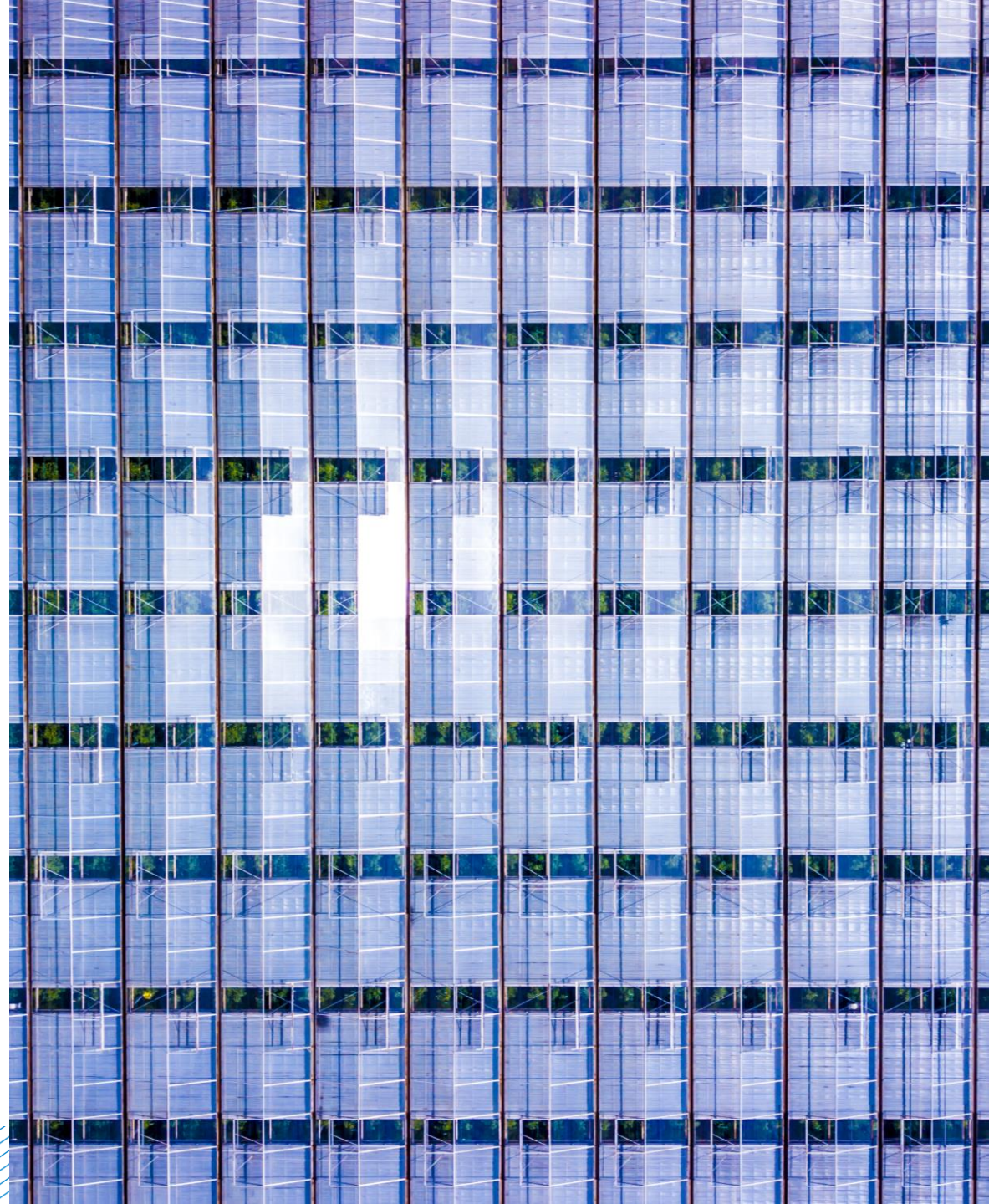


INCREASED PRODUCTION, FOOD SAFETY AND INNOVATION, LESS RESOURCES NEEDED PER KG PRODUCE

INCREASED BUSINESS RISK, MORE RESOURCES NEEDED PER KG PRODUCE

Why semi-closed greenhouses?

- Efficient Use of Resources
- Increased Yield
- Year-Round Local Production
- Import independence
- Food Safety



Research gaps

- What is the **environmental footprint** of a crop grown in a semi-closed greenhouse?
- How much does the **greenhouse structure** contribute to the overall environmental impact?
- How do we ensure that this form of cultivation happens **most sustainably**?

Solution

A **Life Cycle Analysis** that includes greenhouse structure and operation. To use the results for:

- identifying the hotspots,
- optimizing resource use;
- comparing alternative choices;
- informed decision-making;

to improve greenhouse's sustainability and make it "future proof".

Sample project information

- Fully automated semi-closed lettuce greenhouse
- 2.5 hectares
- Located in dry-cold region
- With grow lights
- And natural gas heating

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Project information

- Based on the FreshProducePEFCR (First draft)
- Environmental Footprint (EF 3.1) methodology (EU)
- In SimaPro software and with Ecoinvent database
- 3rd party verified LCA

Functional Unit

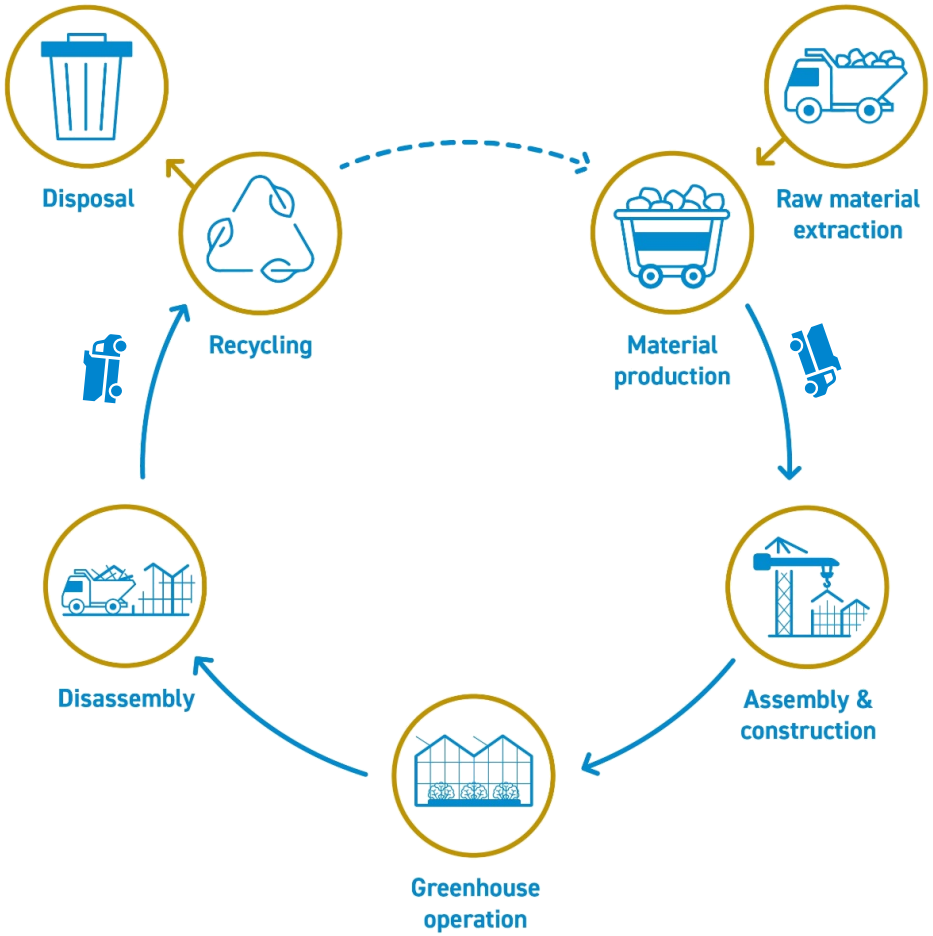
- Construction: 1 m^2 of greenhouse

  Cradle to grave

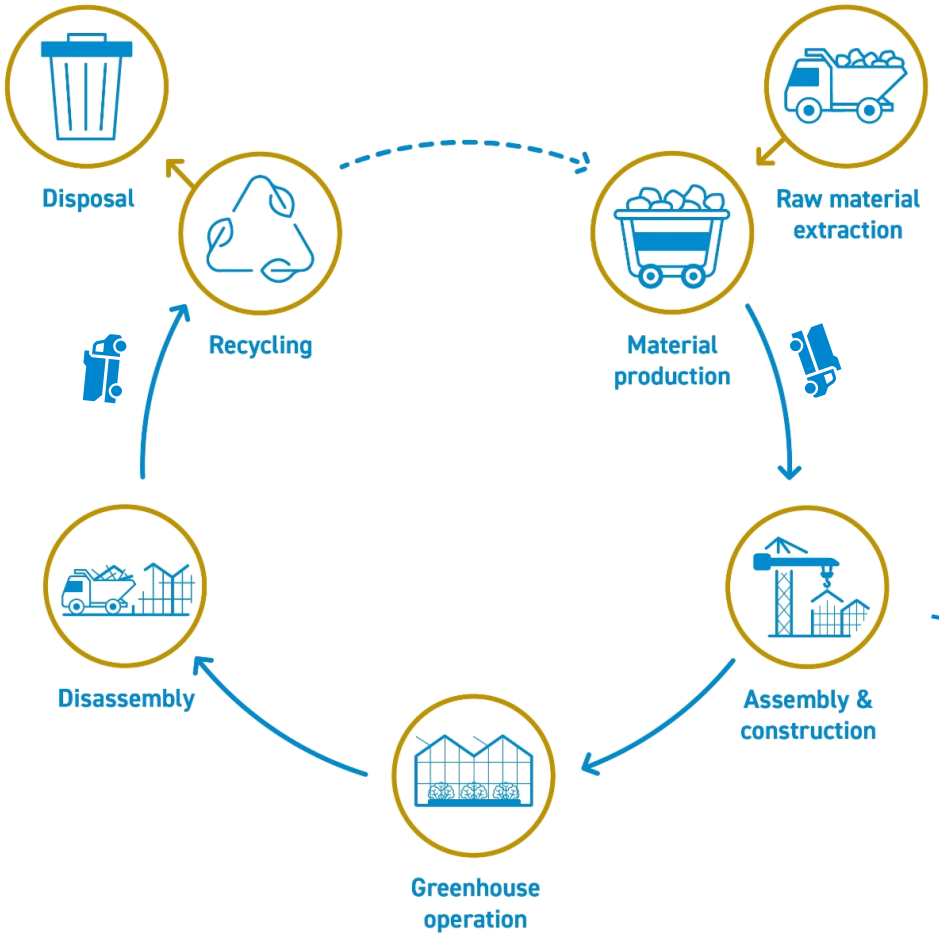
- Total life cycle: 1 kg of produce

  Cradle to distribution center gate

Greenhouse LCA

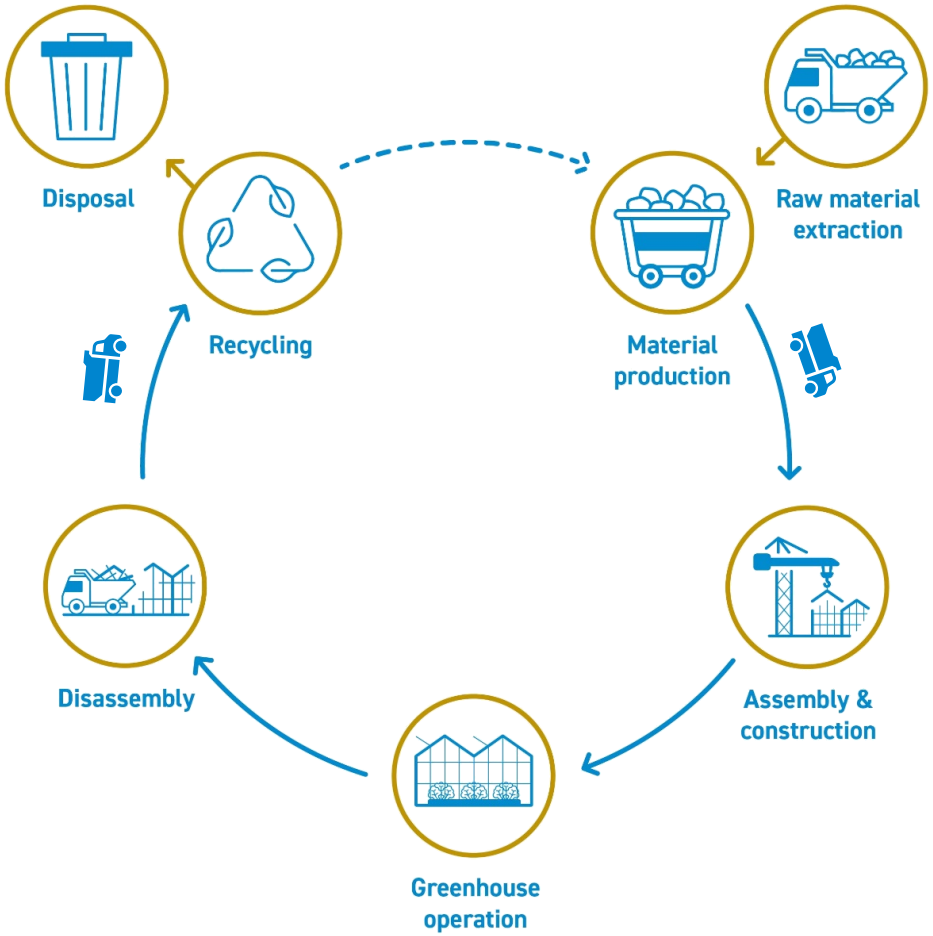


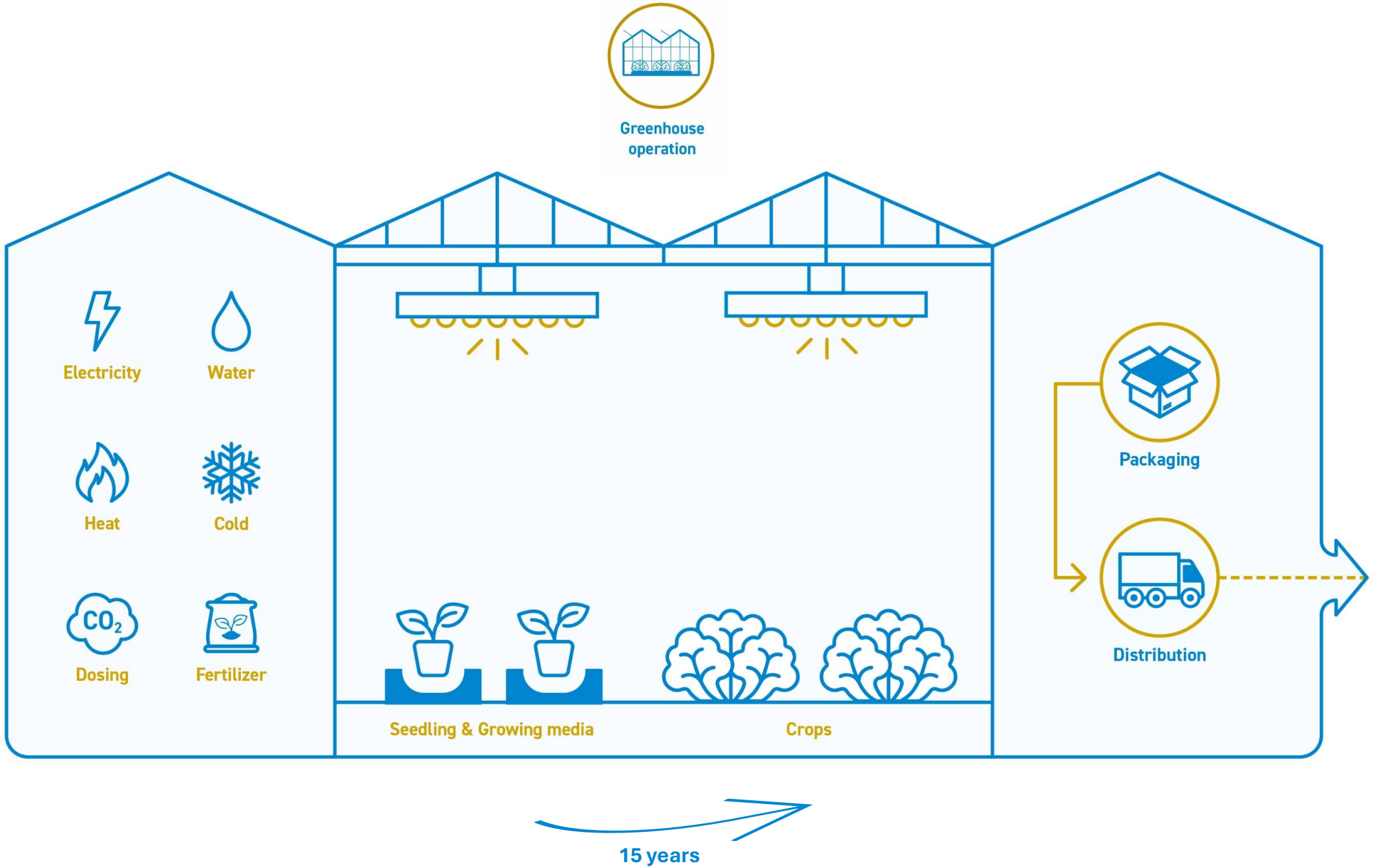
Greenhouse LCA



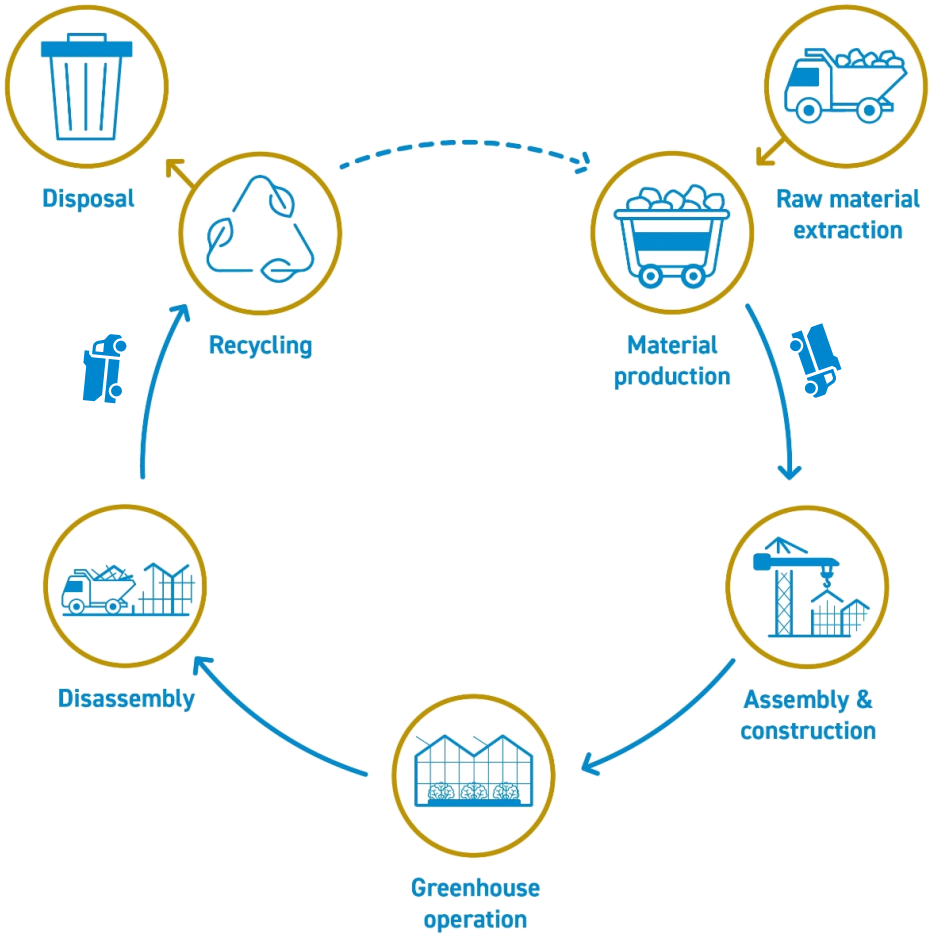
- Plot preparation
- Substructure
- Aluminum components
- Cladding material and screens
- Pad wall
- Pipes
- Grow gutter system

Greenhouse LCA



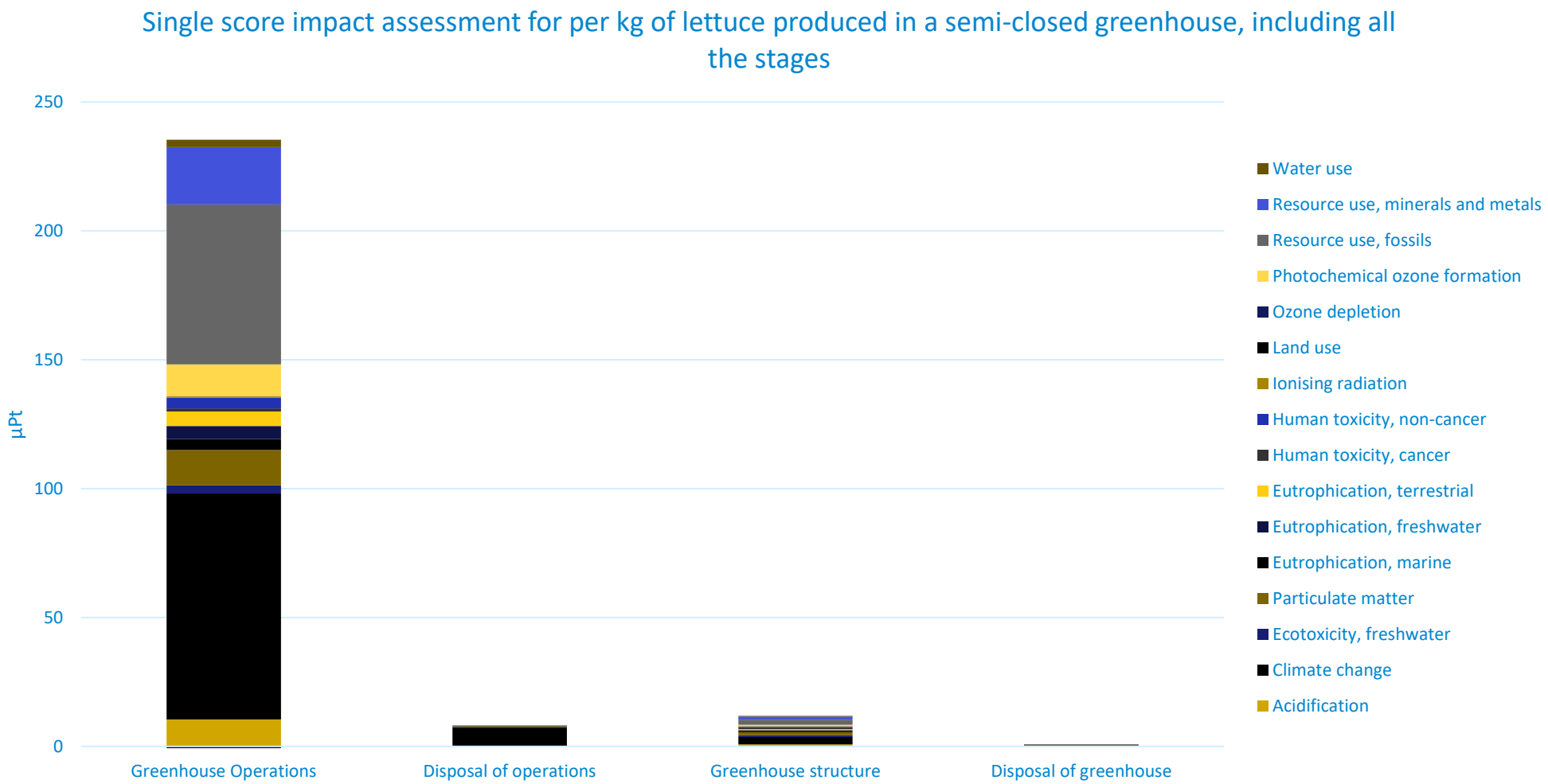

Greenhouse operation
Electricity
Water
Heat
Cold
CO_2
Dosing
Fertilizer
Seedling & Growing media
Crops
Packaging
Distribution
15 years

Greenhouse LCA

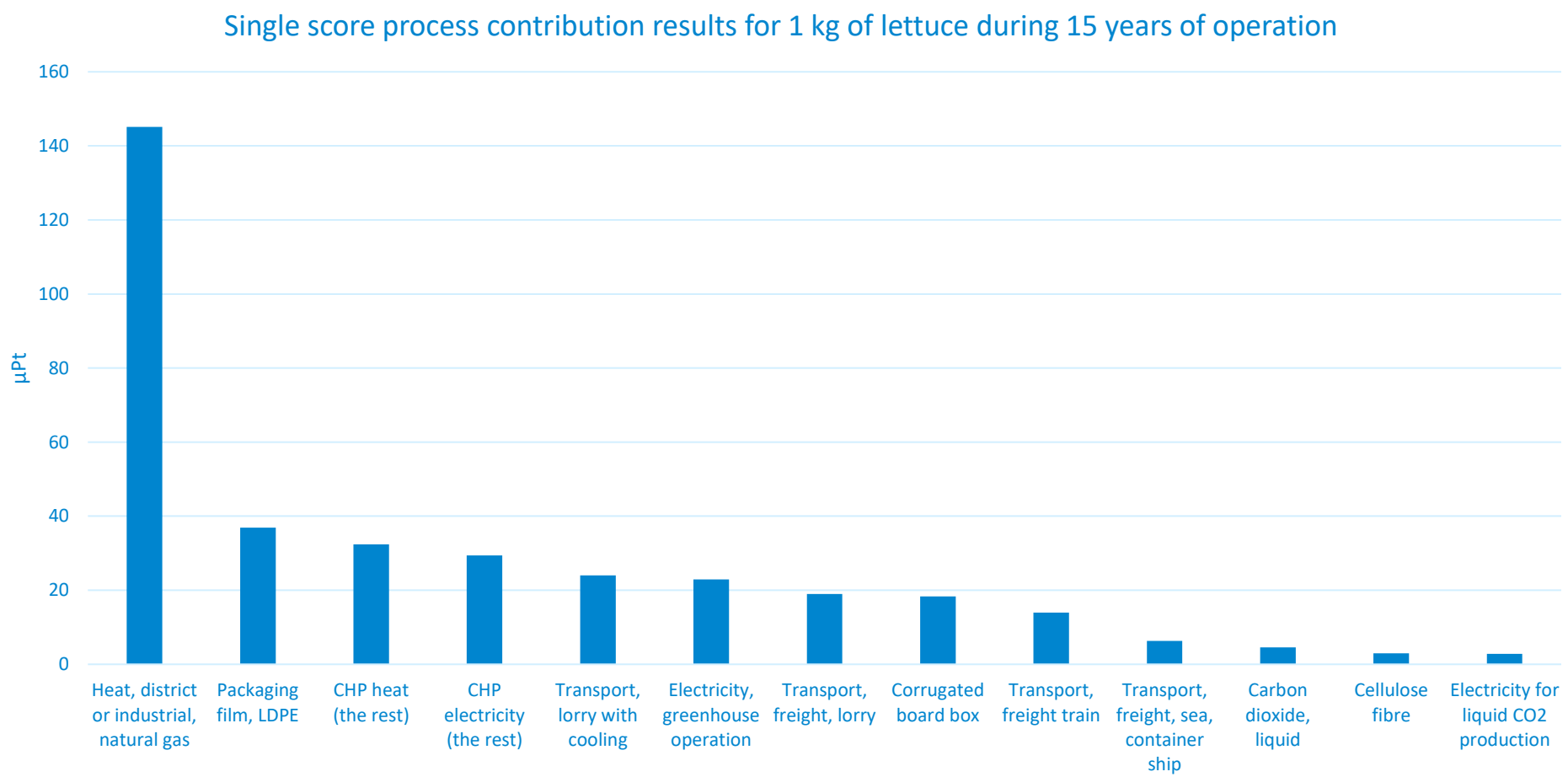


Results

Total

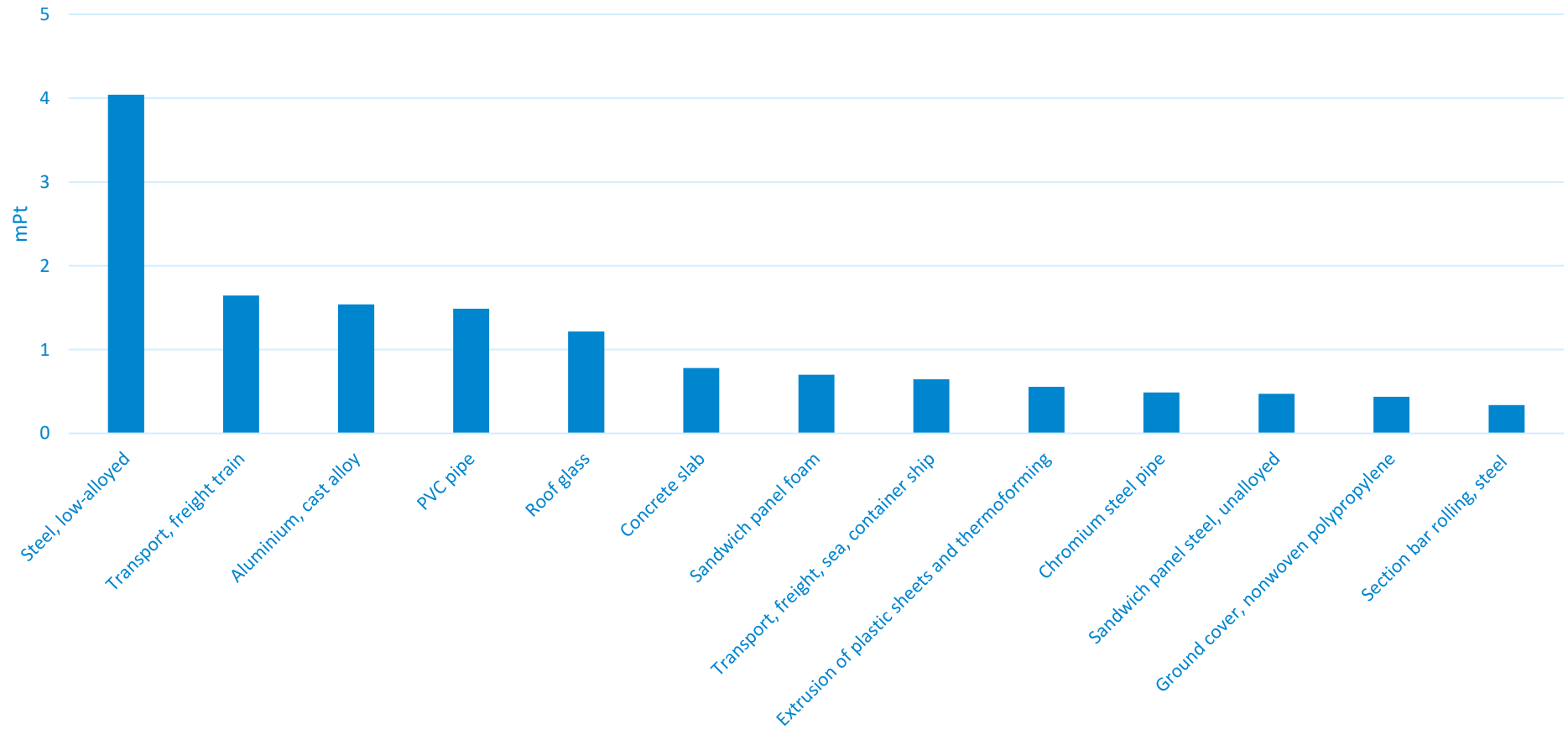

Single score impact assessment for per kg of lettuce produced in a semi-closed greenhouse, including all the stages
250
200
150
100
50
0
µPt
Greenhouse Operations
Disposal of operations
Greenhouse structure
Disposal of greenhouse
Water use
Resource use, minerals and metals
Resource use, fossils
Photochemical ozone formation
Ozone depletion
Land use
Ionising radiation
Human toxicity, non-cancer
Human toxicity, cancer
Eutrophication, terrestrial
Eutrophication, freshwater
Eutrophication, marine
Particulate matter
Ecotoxicity, freshwater
Climate change
Acidification

Greenhouse Operation



Greenhouse Structure

Single score process contribution results per m^2 of semi-closed lettuce greenhouse, including all the components, cut-off 1.8%



Questions?

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