# BIOMASS VISION NATUUR & MILIEU

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- Dutch environmental NGO
- Ca. 45 professionals
- Aiming for a sustainable world with clean energy, smart mobility and healthy food for all
- Impact by expert reports, vision documents, lobby, new sustainable concepts and public engagement activities
- Collaborating with governments, business and consumers

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# PLANETARY BOUNDARIES

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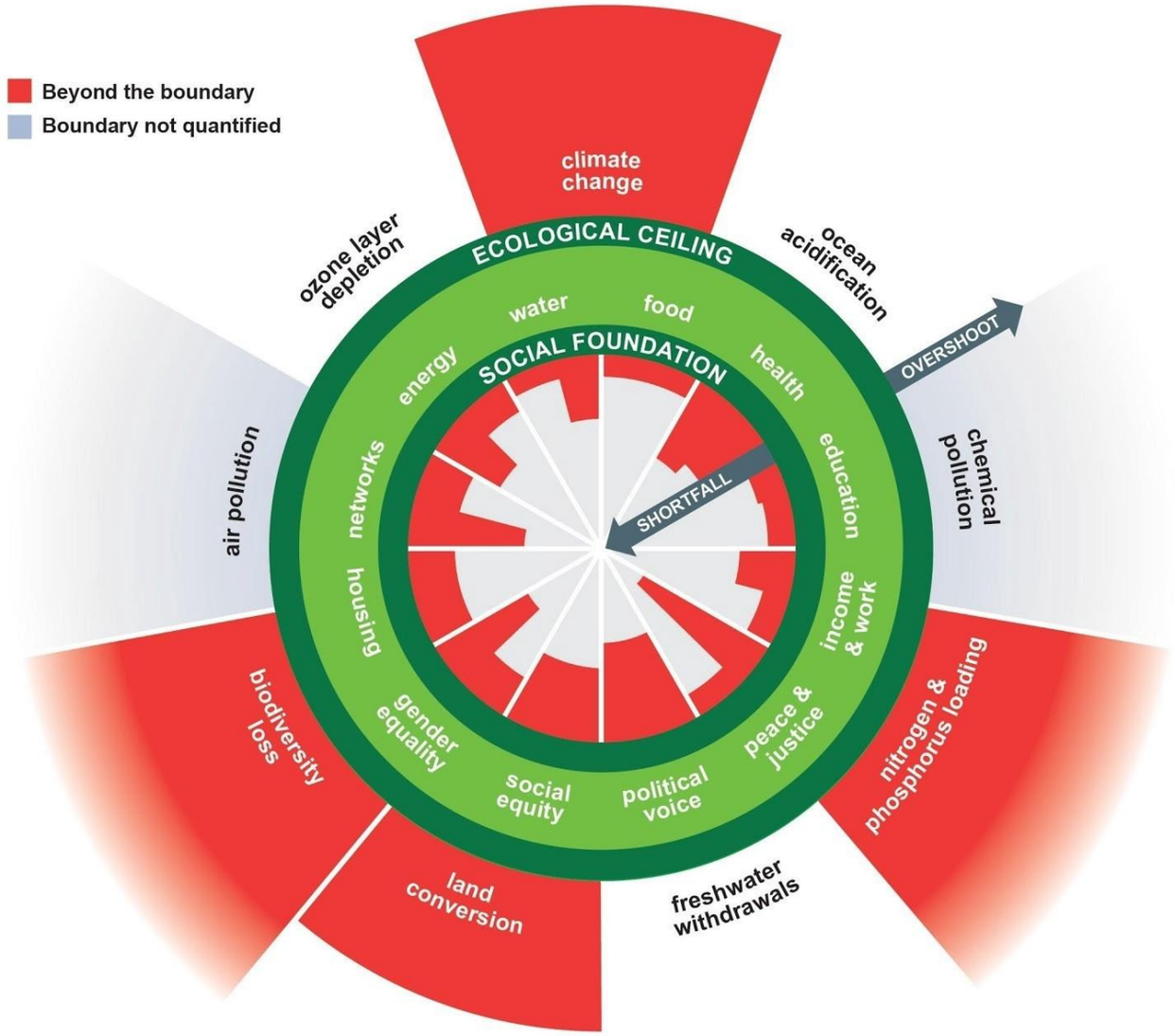
# CROSSING SAFE OPERATING SPACE




Planetary boundaries crossed:

- fertiliser use,
- climate change,
- biodiversity loss,
- and land system change (e.g. deforestation)

Placing humanity at greater risk of a destabilised Earth System

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# CONDITIONS FOR A BIOBASED ECONOMY

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# CONDITIONS FOR A BBE

1. Sustainable cultivation/ production
2. Shift to operate within principles of a circular economy (reuse and cascade, close the loop)
3. Positive overall environmental impact of new applications
4. Lock-in on inefficient conversion techniques must be prevented

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# THE SUPPLY

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# CONDITIONS FOR SUSTAINABLE SUPPLY

- No competition with food
- Preserve Soil quality
- Protect fresh water
- Close nutrient cycles
- No direct and indirect land effects such as deforestation or damaging vulnerable nature
- Ensure proper sociale condities

→ **Sustainable biomass is  a scarce resource**

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# SUSTAINABLE SUPPLY OF BIOMASS

| Study | Year | Mondial availability of biomass [EJ] | Available biomass for the Netherlands in proportion to inhabitants [PJ} |
|---|---|---|---|
| EEA, 2006 | 2030 | 12 (Europe) | 283 |
| Dornburg, et al., 2008 | 2050 | 100 - 150 | 176 - 270 |
| Koppejan, et al., 2009 | 2020 | - | 91* |
| IPCC, 2011 | 2050 | 100 | 176 |
| Biomass Futures, 2012 | 2030 | 9,3 (Europe) | 219 |
| IRENA, 2014 | 2030 | 37 - 66 | 74 - 132 |
| Ecofys, 2014 | 2050 | 100 | 176 |
| PBL, 2014 | 2050 | 50 - 400 | 100 - 760 |
| DNV GL, 2017 | 2023/2035 | - | 133*/203* |

*: only domestic biomass production. No import.

→ 200 PJ Primary additional biomass can be applied (current use for biodiversity, soil fertility, food, feed and materials (including paper) is already covered)

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# THE DEMAND

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# DEMAND PER SECTOR

| Sector | Extreme demand [PJ] |
|---|---|
| Chemical (non-energenic use) | 500 (Elbersen, 2005) |
| Transport (biofuels) | 1220 (CLO, 2014) |
| Electricity | 930 (CBS, 2015) |
| Heat | 1330 (CE Delft, 2014) |
| **Total** | **3980** |

Maximum theoretical demand per sector demand exceeds sustainable supply 20 times

→ Choices have to made

→ Demand has to be limited

→ Wherever possible, focus on real sustainable alternatives for biomass

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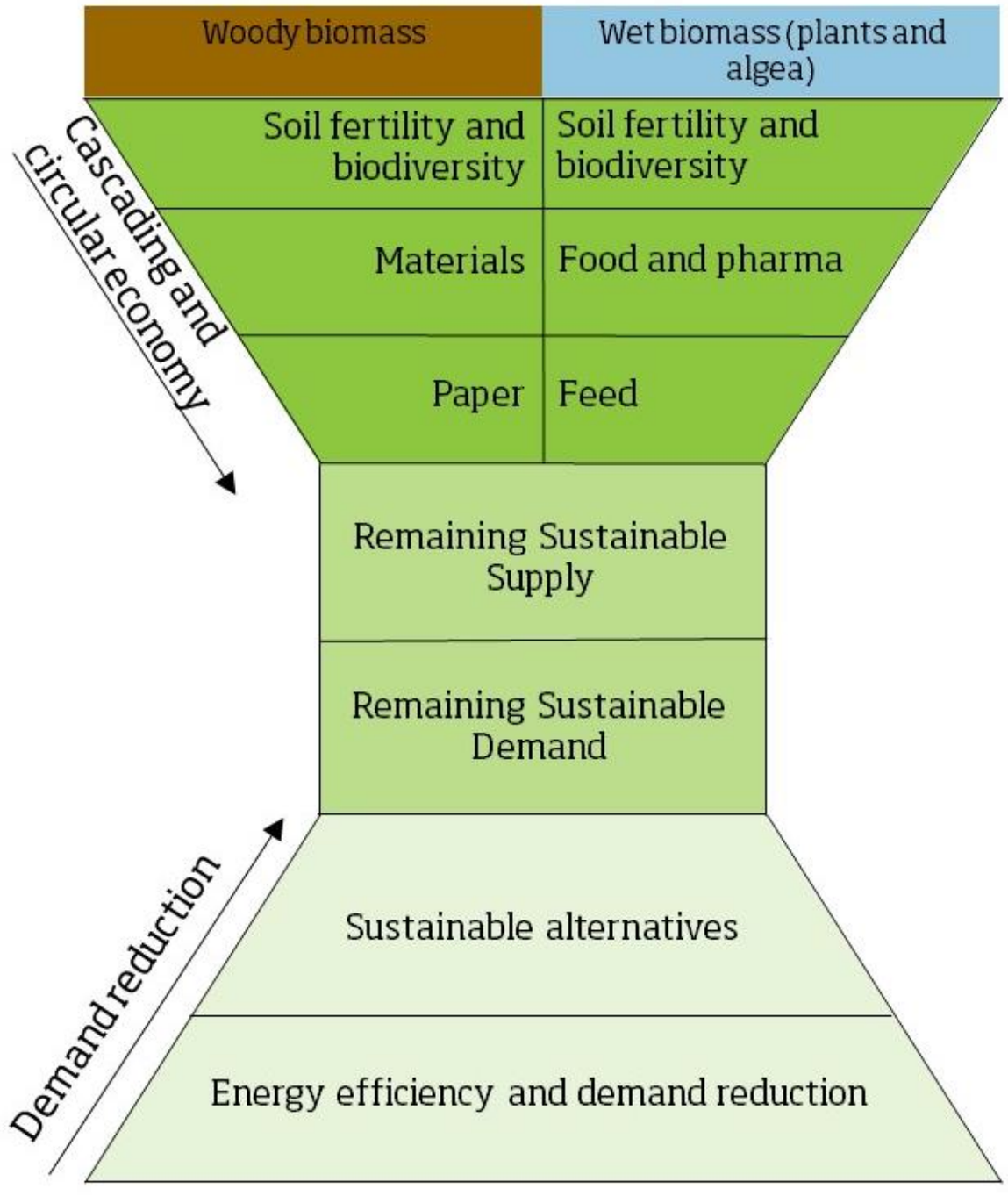
# ASSESSMENT FRAMEWORK

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# CONCLUSION

- No major role for biomass in the energy sector: max 25 PJ electricity (peak demand) and 45 PJ heat
- Limited role of biomass in mobility: electrification of aviation, shipping and long-distance transport as much as possible
- Limited role of biomass in industry: High temperature heat
- Role of biomass in chemistry: specialties, bulk recycling as much as possible

→ **Policy is required to coordinate and limit use**

→ **No subsidies that encourage low-value use**

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# THANK YOU

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