

# Climate Neutrality

## Towards a Science-based Approach

AUGUSTIN FRAGNIÈRE

INTERDISCIPLINARY CENTER FOR SUSTAINABILITY

The logo for the University of Lausanne (Unil), featuring the word "Unil" in a blue, cursive script.

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# Mainstream understanding of carbon neutrality

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→ Need of a more **science-based** conception of carbon neutrality

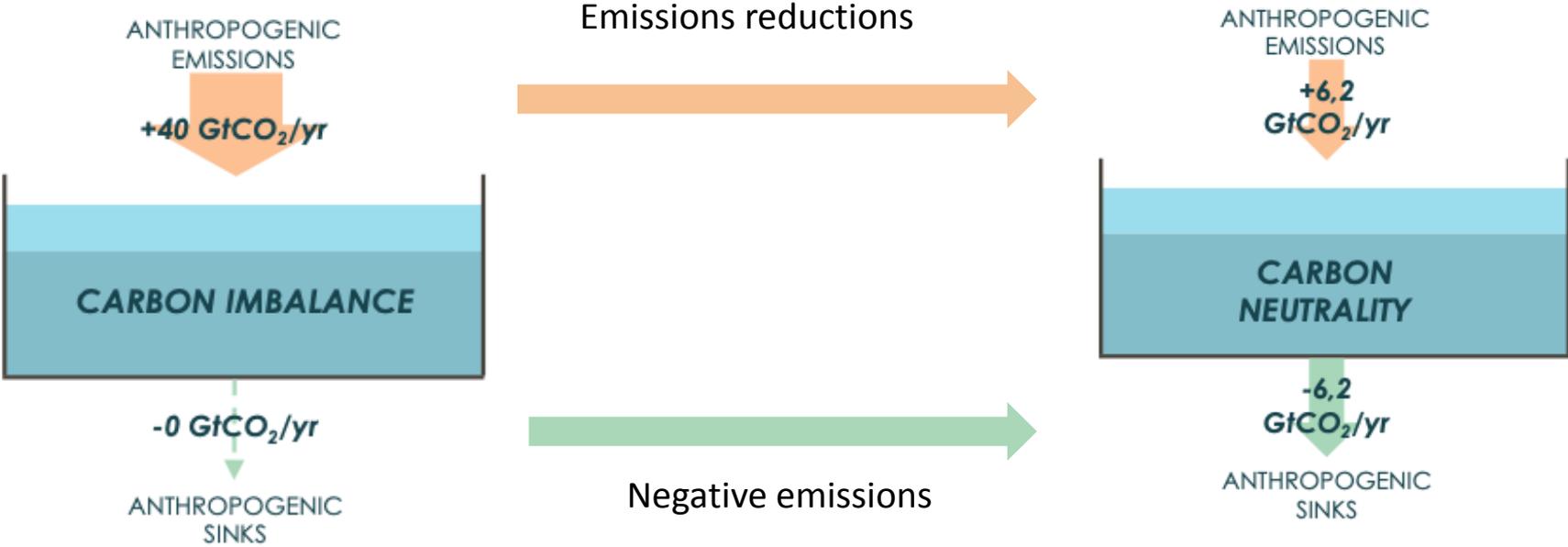
# Carbon neutrality = net zero emissions

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“Net zero carbon dioxide (CO<sub>2</sub>) emissions are achieved when anthropogenic CO<sub>2</sub> emissions are balanced globally by anthropogenic CO<sub>2</sub> removals over a specified period. Net zero CO<sub>2</sub> emissions are also referred to as carbon neutrality”

IPCC, Special report 1.5 ° C

# Zero net emissions at global scale



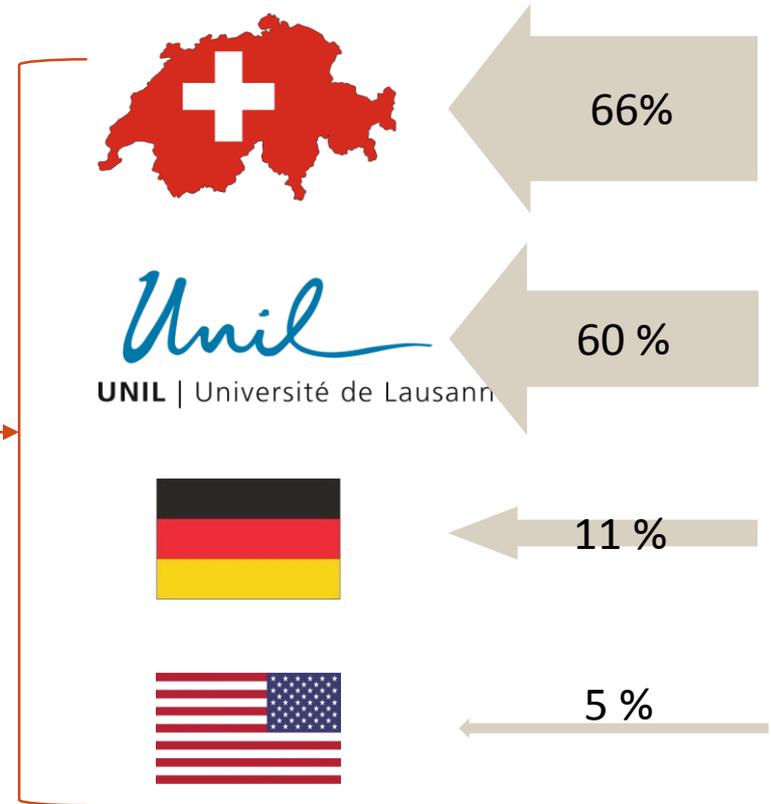
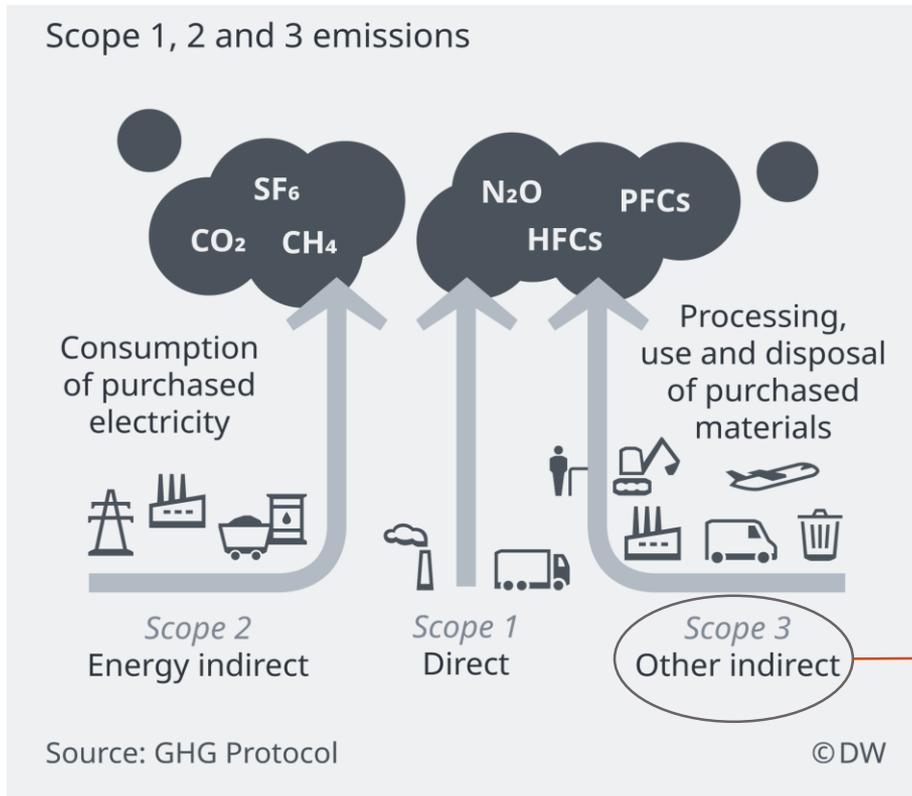
Source: Net zero initiative, Carbone 4

# Three main elements of a climate strategy

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1. Carbon footprint (which scopes?)
2. Emission pathway (what target?)
3. Carbon finance (role of carbon credits?)

# Carbon footprint



# Emission pathways

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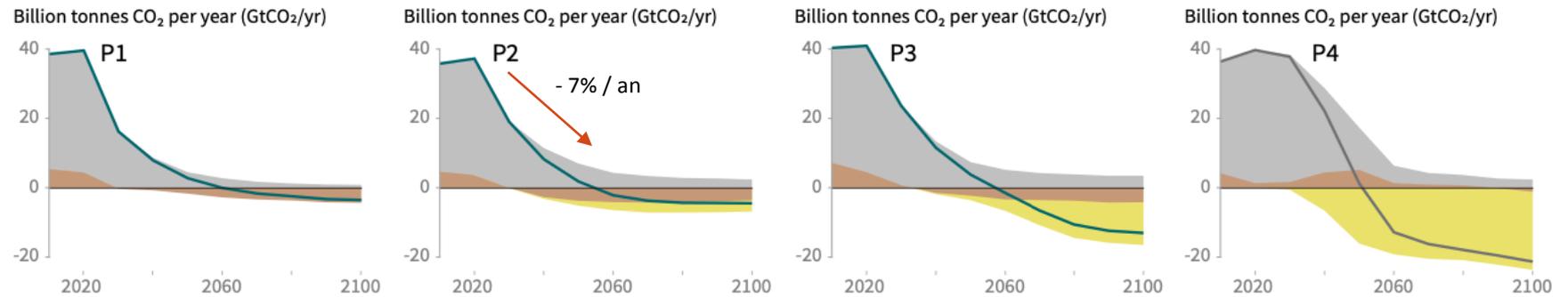
“Holding the increase in the global average temperature to **well below 2 °C** above pre-industrial levels and to pursue efforts to **limit the temperature increase to 1.5 °C** above pre-industrial levels”

Paris Agreement

# Emission pathways

## Breakdown of contributions to global net CO<sub>2</sub> emissions in four illustrative model pathways

● Fossil fuel and industry   ● AFOLU   ● BECCS



1.5°C : - 47% by 2030, -95% by 2050 (net zero emissions)

2°C : - 25% by 2030, -95% by 2070 (net zero emissions)

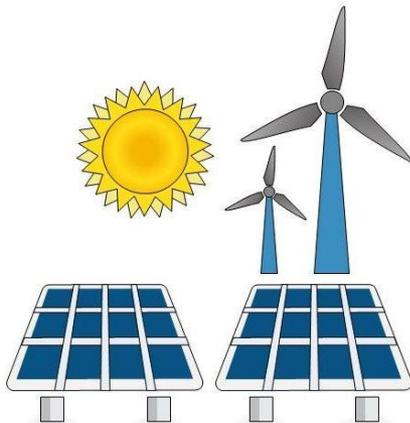
Source: IPCC, Special report 1.5 °C

# Carbone finance

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## Two types of carbon credits

Avoided emissions (AE)



Negative emission (NE)



# Can the purchase of AE credits achieve carbon neutrality?

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- Doubts about the environmental integrity of carbon credits
- Based on dubious accounting principles (arbitrary equivalence between reducing one's own emissions and buying credits)
- Incompatible with the net zero target at global scale (not universalizable)
- Hides the most important information: the real ambition of emission reductions

# Can the purchase of NE credits achieve carbon neutrality?

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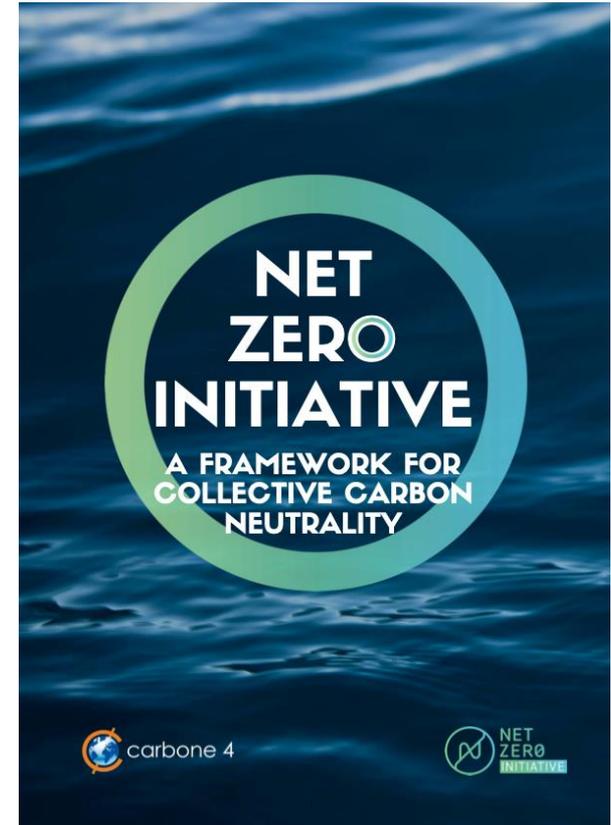
Maybe, under stringent conditions

- Environmental integrity: permanence of carbon sequestration
- Transparency in carbon accounting and communication
- Only if compatible with the net zero target at global scale

# Transparency in carbon accounting

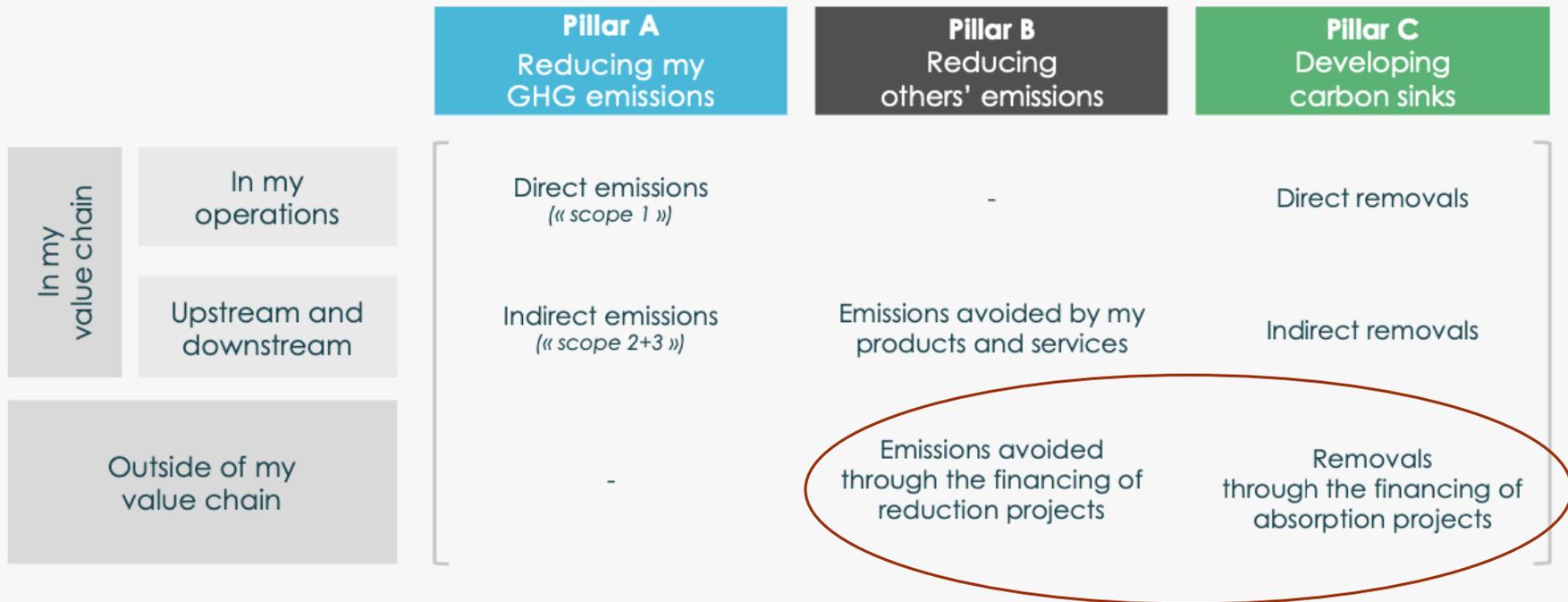
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1. Reducing one's own emissions  
(direct and indirect)
2. Helping others reduce their emissions  
(AE carbon credits)
3. Implementing negative emissions  
(directly or through NE carbon credits)



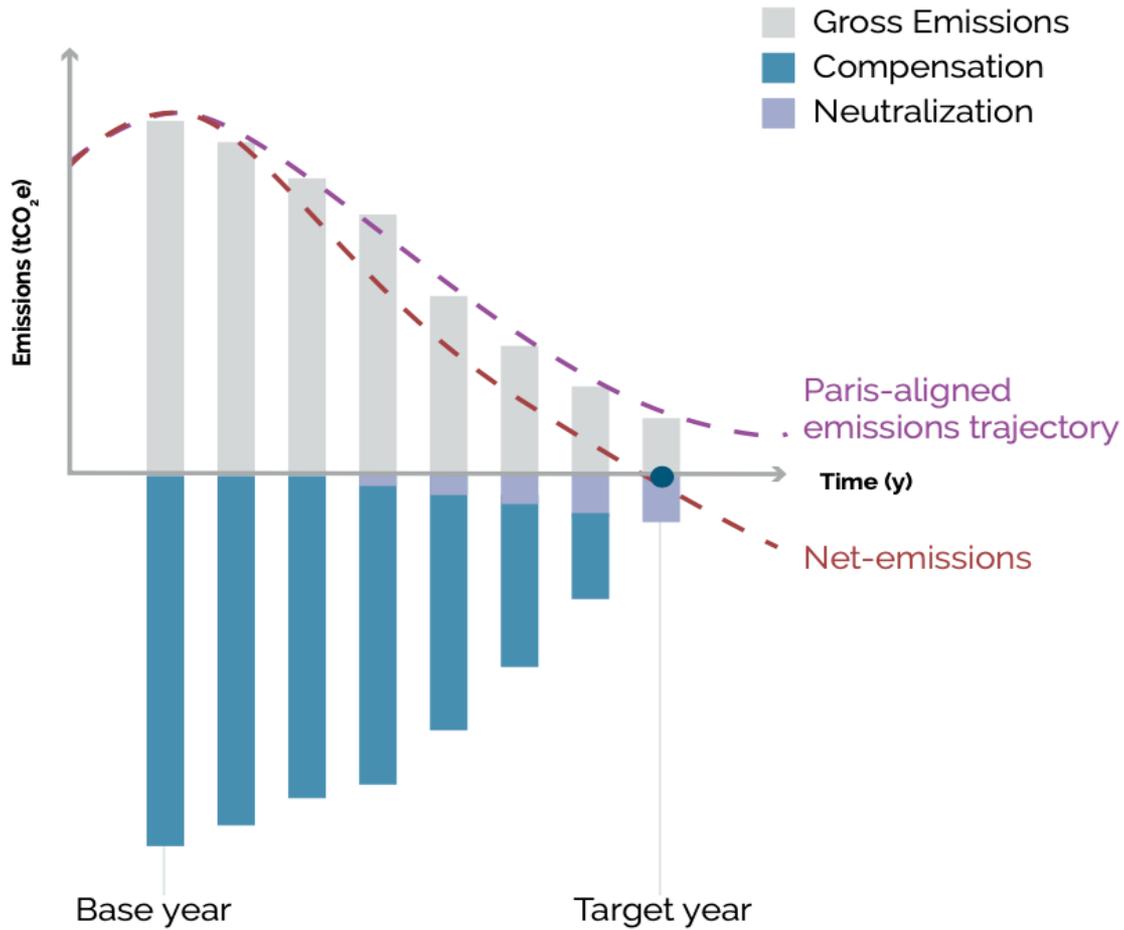
# Transparency in carbon accounting

## THE NET ZERO INITIATIVE DASHBOARD



Source: Net Zero Initiative

# Aligned with net zero at global scale



Science Based Target initiative (SBTi)



# Communication

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- Abandon the term «carbon neutrality» altogether?
- Alternatives
  - Contribution to global neutrality (or net zero)
  - Transition to neutrality (or net zero)
  - Alignment with the Paris Agreement goals
- Highlighting the transparency and rigor of your climate strategy

# Take home messages

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1. Carbon uptake by natural ecosystems does not count in the definition of carbon neutrality
2. Carbon neutrality cannot be achieved through mainstream carbon offsetting (esp. avoided emissions credits)
3. Carbon neutrality cannot be claimed until the target of a Paris-aligned pathway has been reached (and balanced with negative emissions)
4. Transparency in carbon accounting and communication (NZI dashboard)
5. Use alternative catchwords (contribution, transition, etc.)