Sebastian Spaun, 21.11.2024

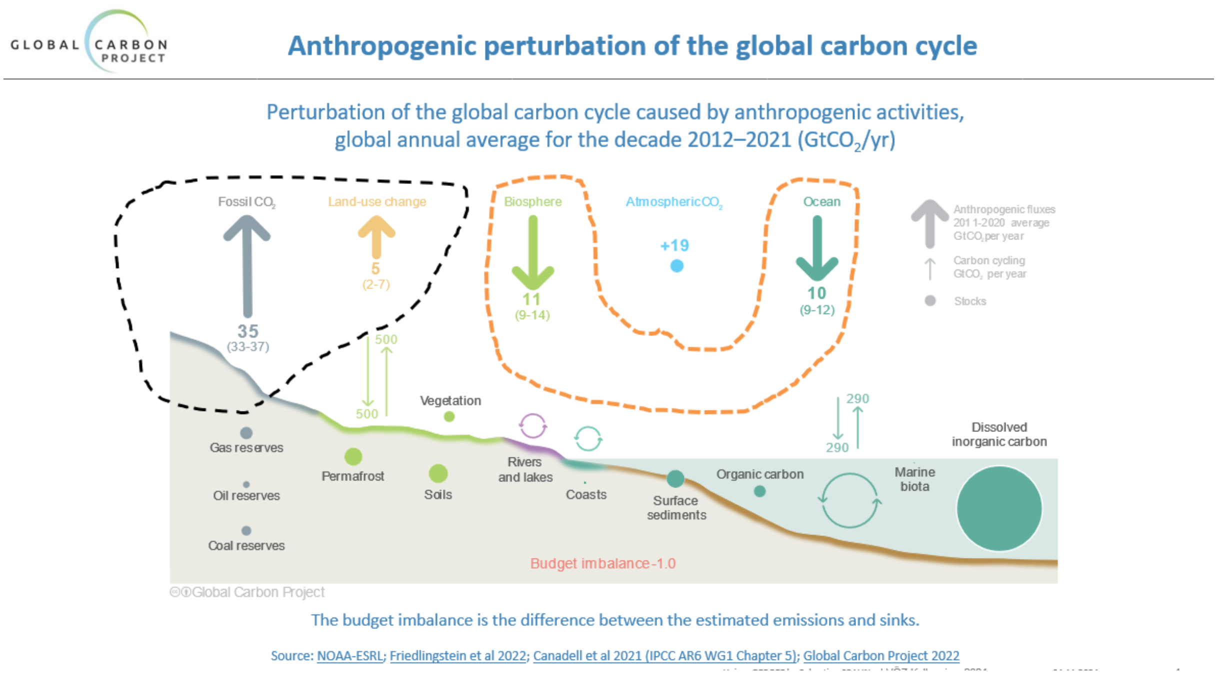
Content of my statement at the Panel discussion: Opportunities and limitations of life-cycle approaches in policy making?

To mitigate climate change, we need to reduce emissions (fossil and LULUCF) as quickly as possible on the one hand, while also protecting or expanding CO_2 sinks in parallel. At the same time, efforts to technically remove carbon from the atmosphere must be increased (e.g., carbonation, mineralisation, direct air capture (DAC), CCU).

Life cycle assessment remains blind in one eye as long as the forest as carbon sink and in particular forestry, is not included in the assessment framework.

- The well-known American **climate scientist Prof. W. Moomaw (lead author of the IPCC & co-winner of the Nobel Prize in 2007) states it clear and simple: "All forests sequester carbon, but could be storing twice as much because repeatedly harvested forests and plantations store much less carbon than natural forests [Erb et al. 2018].**
- **This statement is based and confirmed by one of the most highly cited scientists. Karl Heinz Erb et al. and his work:** "Unexpectedly large impact of forest management and grazing on global vegetation biomass"…." *Here we show, using state-of-the-art datasets, that vegetation currently stores around 450 petagrams (=Gt) of carbon. In the hypothetical absence of land use, potential vegetation would store around 916 petagrams of carbon, under current climate conditions. This difference highlights the massive effect of land use on biomass stocks."*
- In the very latest publication D. Maierhofer et. al., Nov. 2024: ***Linking forest carbon opportunity costs and greenhouse gas emission substitution effects of wooden buildings: The climate optimum concept.***
- In this publication the climate optimum concept is introduced, which links both GHG emission substitution and associated carbon opportunity cost of wooden buildings. The application of the concept to a case study building shows that the GHG substitution benefits of wooden buildings for climate change mitigation are overshadowed by carbon opportunity costs in forests. In the analysis, no wooden scenario achieves sufficient life cycle embodied GHG emission substitution in order to compensate for the unrealized carbon storage potential in the forest system due to harvest.
    - **→Wood-based GHG mitigation strategies in the building sector and beyond need to consider this unrealized carbon storage potential of forests expressed via carbon opportunity costs, in order to obtain a more comprehensive picture of the climate impact of forests and wood-based products.**

The problem is that LCA development is slow and not free of political mainstream thinking.
Prof Bill Moomaw brings it to the point:
*"Many governments recognize that carbon dioxide emissions from fossil fuels contribute to climate change, but **mistakenly believe** that forest bioenergy and long-lived wood products are solutions"*
*It is **essential to account accurately for carbon dioxide** and other heat trapping gases"*



The global carbon cycle (or global CO_2 balance) shows that, in addition to fossil emissions, forests and above-ground biomass (as a sink) are the main levers in combating climate change. So, in terms of LULUCF, it is a matter of curbing deforestation and clear-cutting, which mobilizes carbon from the soil even more, and on the other hand, allowing existing forests to grow and age more than before.

The subsequent graph (Fig. 2) shows that it is of crucial importance **how high ultimately the CO_2 concentrations in the atmosphere will still rise despite current mitigation efforts, because the resulting peak temperature (shown on the right) will stay with us for the next 2000 years!**

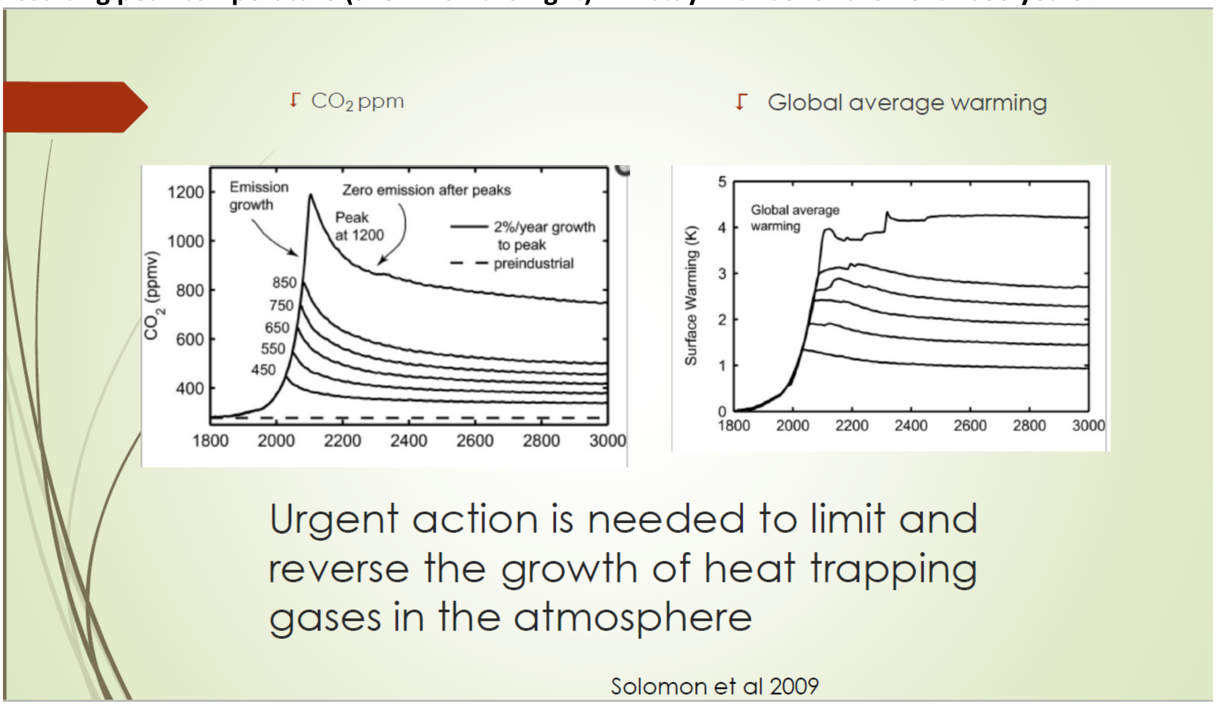
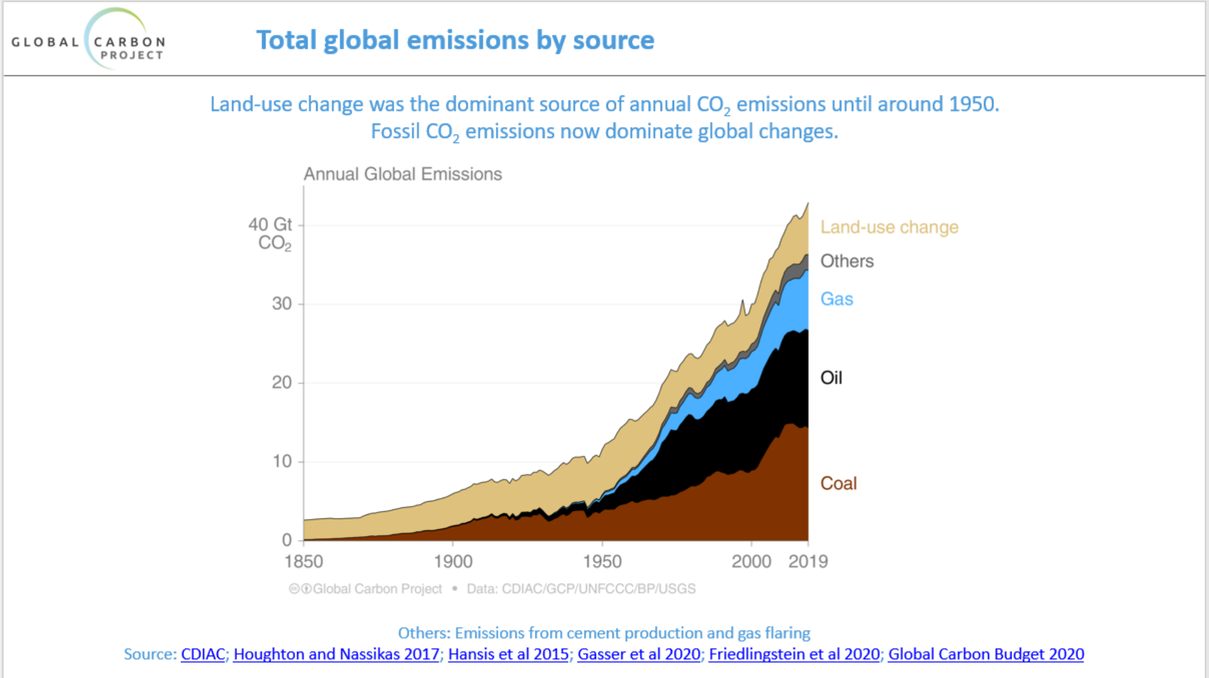
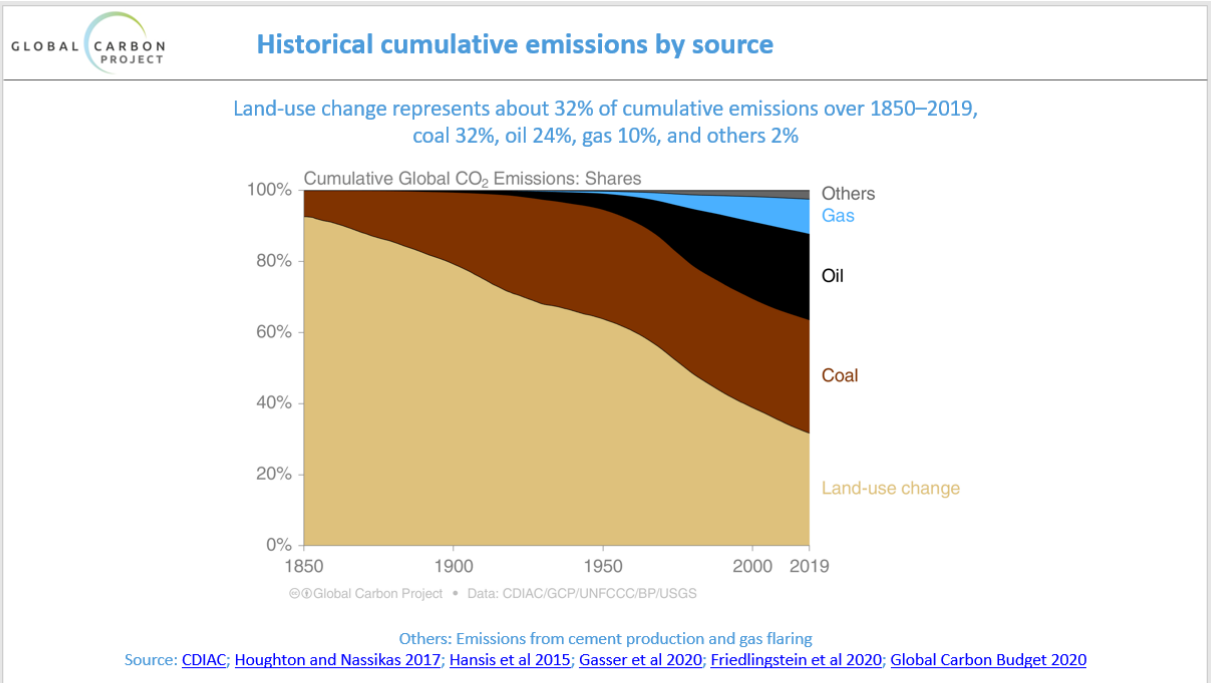


Fig. 2: Slide from the presentation by Prof. William Moomaw, given at the International Conference on Forests for Biodiversity and Climate, February 4-5, 2020 in Brussels.

Back to the importance of LULUCF. In fact, between 1850 (the beginning of industrialization) and the end of WW2, LUC (land use change) was the largest source of CO_2 globally, and thus was mainly responsible for the increase of CO_2 emissions in the atmosphere. Today, the LULUCF sector (and mainly deforestation) is still responsible for 10 - 14 % of the annual global CO_2 emissions (Fig. 3).



When historical CO_2 emissions are summed from the beginning of industrialization to the present, CO_2 emissions from the LULUCF sector are of the same order of magnitude as those from coal combustion and even higher than the cumulative CO_2 emissions from the total combustion of petroleum products (Fig. 4).



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