Atmospheric Carbon Dioxide residence time

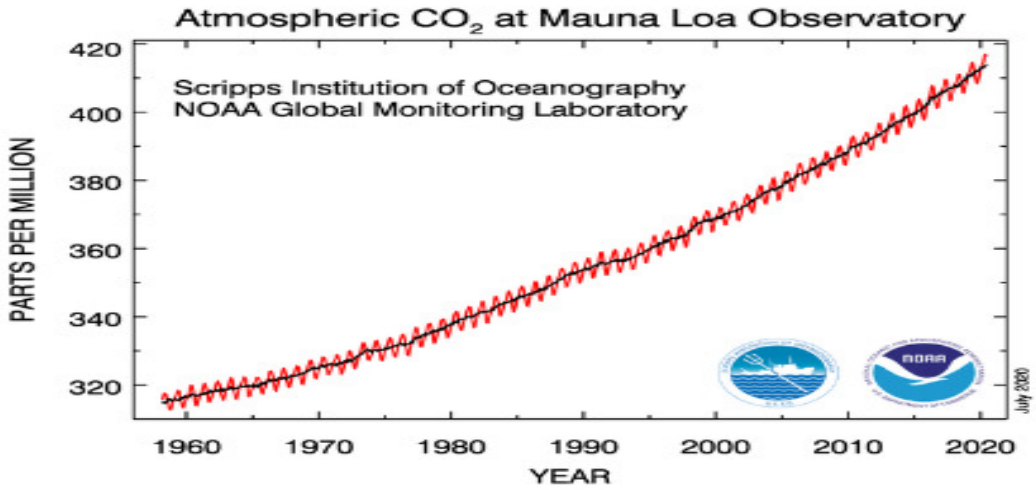
In a 2003 IPCC report, The Intergovernmental Panel on Climate Change gave a range of 5 years to 200 years for residence time, which can be a range of time. However, most Chemical Engineers use average residence time. That is what we are interested in. We need to know on average how long it takes a molecule to be consumed by photosynthesis, diffused to the exosphere, or captured by oceans. This time is at least 150 years. The full manuscript can be accessed at:
https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2017JD028121

Residence Time (Years)	Author	Year
700	Allen	2009
610	Zickfeld	2013
500	Matthews	2008
300	Plattner	2008
270	Cao	2010
230	Zickfeld	2012
220	Solomon	2012
220	Knutti	2012
210	Gillett	2011
180	Frolicher	2010
150	Hare	2006

Even at a residence time of 100 years, atmospheric CO_2 never lowers as a result of working on emissions. Constraints for this chart.

45% reduction in fossil fuel CO_2 emissions by 2030
55% reduction in fossil fuel CO_2 emissions by 2130 due to depletion of those fuels.
2030 45% reduction in the rate of rise of Atmospheric CO2.
2130 45% reduction in CO_2 concentration
2230 55% reduction in CO_2 concentration and rate.

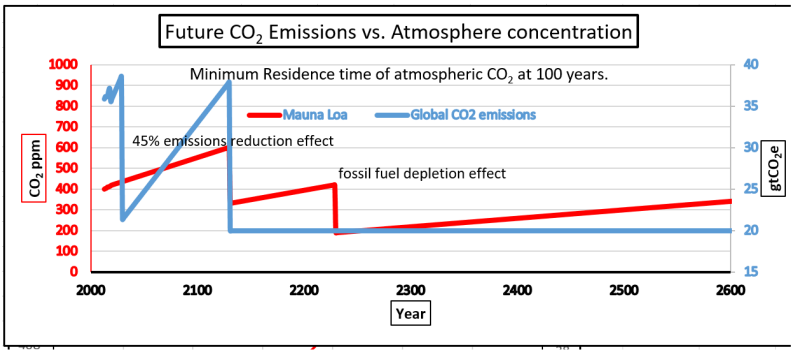
Another way to look at residence time is a signature from past events, which lowered CO_2 emissions. For example the oil embargo in the 1970's, multiple recessions and the big worldwide recession in 2009. The current COVID-19 pandemic. These are examples of lowered worldwide emissions. Below is the current graph of Mauna Loa CO2. You can clearly see no signature from these events.



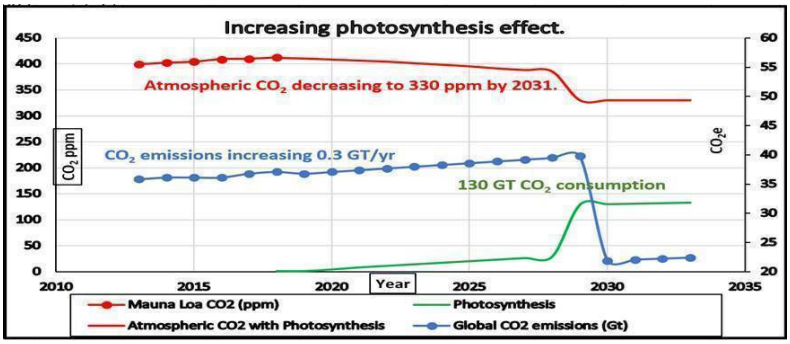
Why is the residence time increasing? Because of massive worldwide non-sustainable deforestation.
http://Globalforestwatch.org/map

A selection of manuscripts: Northern Hemisphere forests are not consuming nearly as much carbon dioxide as most climate change scientists claim. (Northern Hemisphere (NH) forests consume 2.6 gtyr-1 (2.6 billion tons per year) of carbon dioxide. We have 36 gtyr-1 (36 billion tons per year) in CO2 emissions. This is not what lowers Mauna Loa in the NH summer with more economic activity and more CO2 emissions. http://www.eeb.cornell.edu/goodale/2002%20GoodaleEcolAppl.pdf

All tropical forests in the Southern Hemisphere have switched to become oxygen consumers and carbon dioxide producers due to organic decay. (https://science.sciencemag.org/content/358/6360/230/tab-pdf



However, atmospheric carbon dioxide lowers quickly with increasing photosynthesis. Plant native trees!



Effect of 4+ billion trees planted in the last 20 months in India, Pakistan and China. Normally Mauna Loa increases around 1.5 ppm (parts per million concentration) per month.

Recent Daily Average Mauna Loa CO_2

March 02: 413.72 ppm
March 01: 414.25 ppm
February 29: 414.12 ppm
February 28: 413.69 ppm
February 27: 413.47 ppm