MethNET – Not

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December 2021

1. Introduction

Hopefully this will be a short post. I am mainly writing it to address a proposal that I do **not** think is a good idea. This is mainly because I read about it in a periodical that I greatly respect, and I really do not wish to hear others saying that it sounds like a great suggestion.

The proposal was in an article in the Nov 5 issue of Science, and it was to use negative emissions technology (I tend to call this NETWORKS) to capture methane. The good news is that this article pointed out several problems with this proposal, repeated below.

2. Why MethNET is Bad

The article in Science pointed out the following issues:

But the technologies face many challenges. …methane only exists at levels of 2 parts per million (ppm), whereas CO_2 has now surpassed levels of 400 ppm. To make a difference, methane removal technologies would have to be deployed on a mammoth scale…

In other word the molecules of methane are so rare that it would take a huge infrastructure to make a significant dent in it, and the proposals for this infrastructure may cause more harm than good.

And some researchers and environmentalists are wary of monkeying with global atmospheric chemistry. Lofting vast amounts of iron-salt particles above the ocean is reminiscent of long-standing schemes for cooling Earth by creating a reflective haze in the stratosphere, an idea some have derided as a potentially dangerous form of "geoengineering." But Jackson rejects that label. Unlike solar geoengineering, the iron-salt method would just speed up a chemical reaction that occurs naturally, he says…

Methane is a much more powerful greenhouse gas than CO_2. However it is also short-lived in the atmosphere, with a half-life of roughly nine to ten years. This means that, for that any methane that is currently in the atmosphere, half of it will have degraded in about 10 years, although the degradation process is complex, it mainly (eventually) degrades to CO_2.

A more effective strategy than MethNET would be shutting down or reducing man-made emissions that are rapidly increasing methane, and let the methane degrade naturally. Within 50 years (5 half-lives) current atmospheric methane will have degraded to roughly 4% of the present amount.

Note that there is a pre-industrial stable level of methane at roughly 0.7 ppm. This is because there are many natural sources of methane. Also the global temperature (think global warming) impacts the activity of natural methane sources, so a warmer planet means higher natural methane emissions.[1]

[1] See my earlier paper "Methane Growth," https://www.energycentral.com/c/ec/methane-growth

See the post below for more information on this. Start in section 2, read the rest of this post to see how to reduce one major source, and then click on a link to another paper at the end of section 2 to see how we might deal with other sources.

https://energycentral.com/c/ec/damn-satellite-part-2-%E2%80%93-damn-airplane-ch4

3. Why NETWORKS is good

Major development efforts have identified methods for removing carbon dioxide (CO_2) from the atmosphere, and I have written on these frequently. The main reasons that many of these are viable is: (1) they potentially produce secondary benefits, and (2) they are mostly shovel-ready. One reason that many of these will work so well is that Mother Nature has already implemented one first step – turning CO_2 into biomass.

The links and descriptions below are to the NETWORKs posts.

New NETWORKS, Part 1: BECCS: The acronym to the left stands for bioenergy with carbon capture and storage. In other words plants (usually of the woody kind) store CO_2 as they grow, then the woody biomass is burned, producing energy and the CO_2 is captured and sequestered for very long periods (thousands to millions of years).

https://energycentral.com/c/ec/new-networks-part-1-beccs

New NETWORKS, Part 2: Mineralization for GHG Capture: Mineralization is using a wide range of alkaline mineral waste to absorb CO_2, which converts the alkaline mineral into another mineral that is suitable for long-term burial.

https://energycentral.com/c/ec/new-networks-part-2-mineralization-ghg-capture

New NETWORKS, Part 3: Two Solutions: In this case one of the two solutions includes BECCS covered above, but the woody biomass is mechanically harvested in such a way to enhance wildfire resilience.

https://energycentral.com/c/cp/new-networks-part-3-two-solutions

New NETWORKS, Part 4 – Peridotite & Soil: This paper really does contain descriptions of two technologies. The first is using a clever process to efficiently sequester CO_2 in a class of near-surface mantle-rocks. The second process uses agricultural soil to sequester CO_2 while enriching the soil and enhancing crop yield.

https://energycentral.com/c/ec/new-networks-part-4-%E2%80%93-peridotite-soil

New NETWORKS, Part 5 – Oxi-Fuel Combustion: The NETWORK described by this post is (sort of) BECCS, but the "CC" really superfluous because no carbon capture is required. The output of the process is pure CO_2, water vapor and heat that can be used to produce electricity or provide process heat.

https://energycentral.com/c/cp/new-networks-part-5-oxi-fuel-combustion

Also note that many of these NETWORKS use woody biomass. As I am writing this, I am in my mountain home in Arnold, CA. Looking out of the window, there are 20 or 30 huge CO_2 containers (a.k.a. Jeffery Pine and Incense Cedar trees). Although these are not intended to be harvested anytime soon, if they were, they would be turned into lumber, which would most likely be used in long-lived structures (houses and other buildings), with the waste from lumber production being woody biomass. When the structures reach the end of their lives, their woody biomass will still be there.

So there are many benefits from these CO_2 containers.