

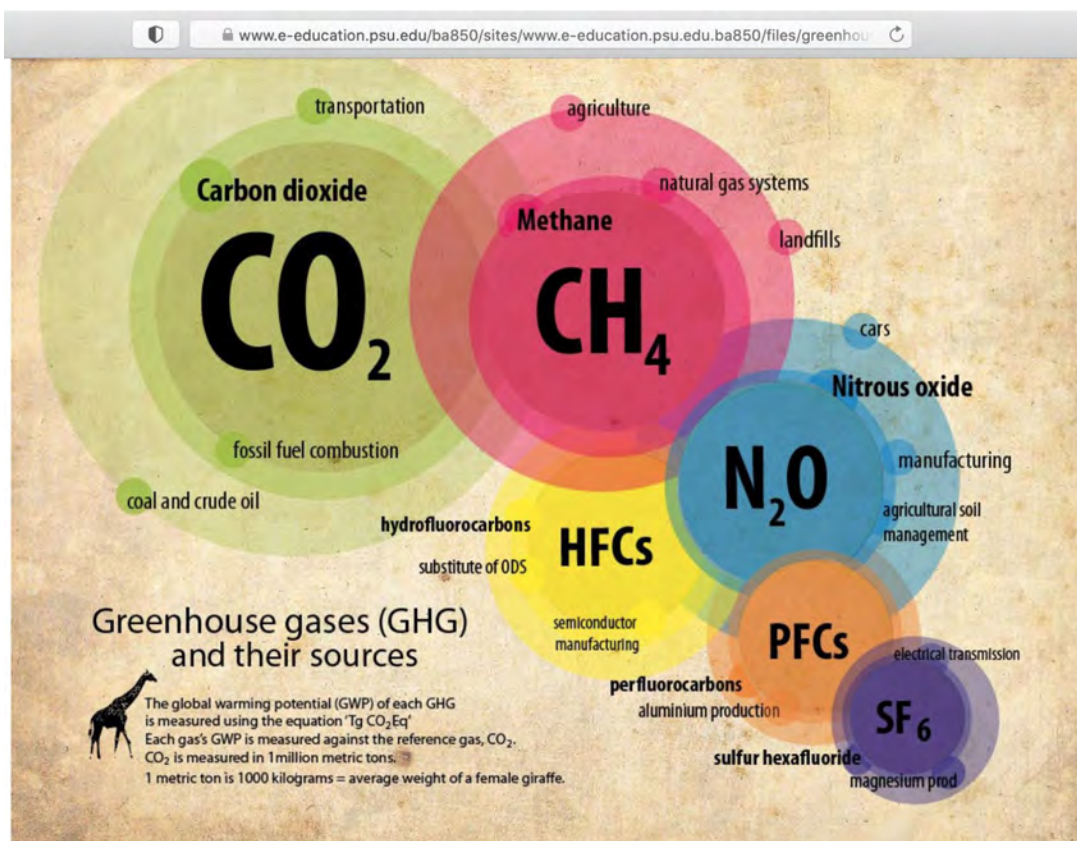
Public Comment

October 26, 2023
RCEA Board of Directors
Regular Meeting

From: [Jesse Noell](#)
To: [Lori Taketa](#); [350 Humboldt](#)
Subject: RCEA Policy, GHGs and efficiency of CO2 refrigerant heat pumps
Date: Monday, October 2, 2023 12:14:30 AM
Attachments: [relative GHG warming potential.png](#)
[JEH 7.6GtC.png](#)

Hi Lori, [et.al.](#)

Every so often, it is appropriate to consider how the catastrophic global warming we now face manifests.



As we remember, Terra Gen wind turbine generator switching and electrical arcing fire control systems would have emitted high amounts of SF₆, an extremely stable GHG molecule, which persists in the atmosphere for more than 3,200 years and has a CO₂e of 23,500 times more potent than CO₂.

CO₂ is used as a refrigerant in certain heat pumps instead of fluorocarbons. Most heat pumps use HFCs. Humboldt County and RCEA could ban fluorocarbon heat pumps.

To the extent that Humboldt County authorizes/ encourages use of recycled solar panels, PFC emissions are avoided or reduced.

If RCEA pursues its policy of wind generation, much more CO₂e will need to be drawn down. Thus, the cost of draw down and sequestration is important to include as a cost in any project. Here is one estimate of the cost:

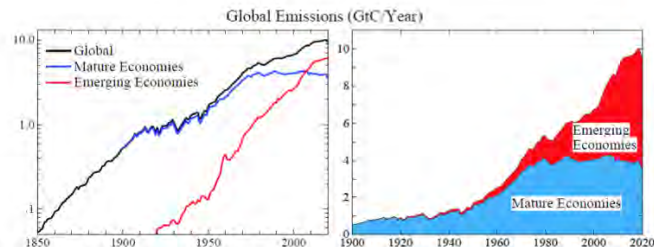


Fig. 29. Fossil fuel CO₂ emissions from mature and emerging economies. China is counted as an emerging economy. Data sources: Heffner *et al.*¹⁹⁶ for 1751-2017 and BP¹⁹⁷ for 2018-2020.

report, the RCP2.6 scenario defines the rapid downward trend of greenhouse gas climate forcings needed to prevent global warming from exceeding 2°C relative to preindustrial climate. The gap between that scenario and reality continues to grow. In principle, the 0.03 W/m² gap in 2022 could be closed by extraction of CO₂ from the air. However, the required negative emissions (CO₂ extracted from the air and placed in permanent storage) must be larger than the desired atmospheric CO₂ reduction by a factor of about 1.7.⁶⁸ Thus, the required CO₂ extraction is 2.1 ppm, which is 7.6 GtC. Based on a pilot carbon capture plant built in Canada, Keith¹⁹⁹ estimates an extraction cost of \$450-920 per tC, as clarified elsewhere.²⁰⁰ Keith's cost range yields an extraction cost of \$3.4-7.0 trillion. This is for excess emissions in 2022 only; it is an annual cost. Given the difficulty the UN faced in raising \$0.1 trillion for climate purposes and the growing annual emissions gap (Fig. 27), this example shows both the need to reduce emissions as rapidly as practical and the fact that carbon capture cannot be viewed as the solution, although it may play a role in a portfolio of policies, if its cost is driven down.

Climate policy under the Framework Convention demonstrably fails to curb and reverse growth of GHGs (Figs. 27-29). [The Covid pandemic dented emissions, but 2022 global emissions are at a record high level.] This is the "tragedy of the commons": as long as fossil fuel pollution can be dumped in the air free of charge, agreements such as the 1997 Kyoto Protocol²⁰¹ and 2015 Paris Agreement have little effect on global emissions. Energy is needed to raise living standards and fossil fuels are still the most convenient, affordable source of that energy. Thus, growth of emissions is occurring in emerging economies (Figs. 29 and 30a), while mature economies are still the larger source of the cumulative emissions (Fig. 30b) that drive climate change.^{202,203} Thus, exhortations at UN meetings, imploring reduced emissions, have little global effect.

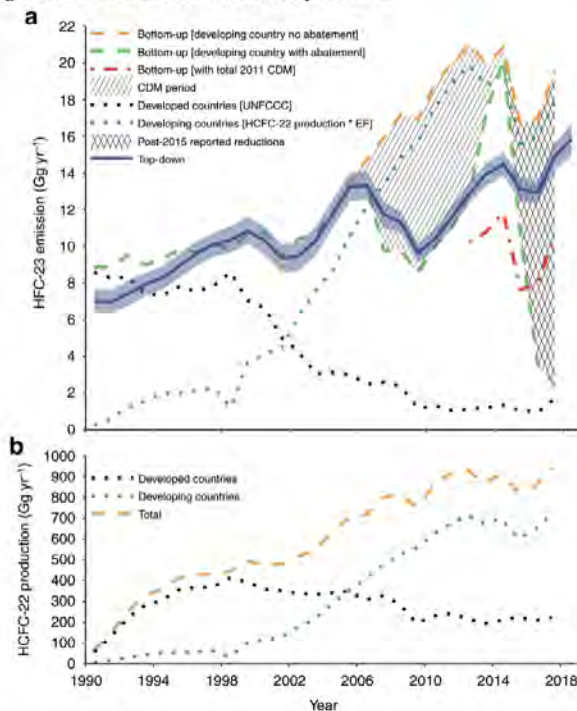
Meanwhile, climate science has exposed a crisis that the world is loath to appreciate. Nor has IPCC, the scientific body advising the world on climate, bluntly informed the world that it has no plan to address the threat posed to the future of today's young people and their children. Leaders are allowed to profess that greater ambitions for future emission reductions are what is needed. Yet the only IPCC scenarios that would phase down human-made climate change amount to "a miracle will occur." Scientific equations do not include a "miracle" term. The IPCC scenario that moves rapidly to negative global emissions has biomass-burning powerplants that capture and

3.0 - Oral/Written Communications

From: [Jesse Noell](#)
To: [Lori Taketa](#); [350 Humboldt](#)
Subject: Re: RCEA Policy, GHGs and efficiency of CO2 refrigerant heat pumps
Date: Tuesday, October 10, 2023 12:26:46 PM
Attachments: [image001.png](#)
[image002.png](#)
[HFC-23 see Nature.png](#)
[image001.png](#)

Increase in global emissions of HFC-23 despite near-total expected reductions

Fig. 1: Global HFC-23 emissions and HCFC-22 production.



a Top-down global HFC-23 emissions (blue line) and uncertainties (blue shaded area; 1σ , incorporating uncertainties due to the prior constraints, measurements, model representations of the data, calibration scale and HFC-23 lifetime, see Methods section) derived from Advanced Global Atmospheric Gases Experiment (AGAGE) data and the 12-box model (inferred emissions available in Supplementary Table 4). All other lines represent global (dashed) or sub-global (dotted) bottom-up estimates: developing countries emissions estimates (HCFC-22 production multiplied by an emissions factor (EF)) are shown in dark green; developed countries emissions obtained from United Nations Framework Convention on Climate Change (UNFCCC) reports are shown in black; the developing countries no abatement global total emissions estimates (sum of emissions

From: Wendy Ring [REDACTED]
Sent: Monday, October 23, 2023 1:39 PM
To: Public Comment
Subject: Public comment

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The minutes of the September 28th meeting contain the following with regard to Dr Stockton's presentation on the health impacts of the Scotia biomass plant:

"The Directors discussed: The need for careful air quality study design and measurement to assure usable results for assessing regulation compliance, and the need for CalPoly Humboldt involvement in an air quality study."

It is important for RCEA Directors and staff to understand that air quality studies cannot determine biomass plant compliance with state and federal regulations and are not necessary to prove the plant's emissions have local health consequences. Dr Stockton and I, as physicians with Masters Degrees in Public Health, both agree on these points. Dr. Stockton told me her comment re Cal Poly was not meant to endorse a study but simply to convey her opinion that, if RCEA wishes to proceed with one, it should be carried out by qualified personnel.

Several months ago I submitted as a public comment the slide deck from a presentation I had hoped to deliver to the board in person along with copies of the plant's numerous Notices of Violation (Ring, 2023; NCUAQMD, 2023). RCEA staff have not been willing to provide time on the agenda for such a presentation and it is clear from the Directors' comments above that the materials alone were not as effective as I'd hoped. I'm going to try again here to convey this information so Directors are not led on a wild goose chase about air quality studies when what I hear you asking is: How does the biomass plant's emissions affect community health?

Regulatory compliance of power plants is not based on measuring the air quality around them but by measuring the concentration of pollution in their smokestacks. Direct measurements are done once every 1-3 years (with the interval dependent on prior results) and concentrations are continuously approximated by continuous pollution monitoring systems. The results of both are reported to air districts, which issue violations when levels exceed federal limits or other required conditions are not followed. Each Notice of Violation specifies the parts of the permit or law which were violated. We already have plenty of violations issued by the air district to tell us about the biomass plant's compliance.

RCEA staff do not have the expertise or objectivity to advise on questions of biomass pollution. Staff have a history of publicly minimizing the seriousness of biomass pollution while at the same time claiming they don't have the time or resources to learn about it. I have heard staff provide outright misinformation such as saying that violations are a legacy issue from when Humboldt Redwoods purchased and reopened the plant in 2015. If you review the Notices of Violation that I previously submitted, you will see that this is not the case. Violations have continued during the years that RCEA has contracted with HSC and there are over 100 additional violations pending from prior years which the air district plans to issue in the near future.

RCEA staff have also tried to minimize biomass particulate pollution by comparing it to the air particulate contribution from road dust. Aside from that fact that we can't shut down road dust like we can shut down a power plant, inorganic particulates do not contain the same kinds of mutagenic, carcinogenic, and inflammatory constituents as particulates from combustion of organic material.

Staff have also tried to reassure the public by saying the air district told them “HSC is not a bad actor” because it responds to and fixes its violations. Fixing something after you get caught is a pretty low bar. Many of these violations are the result of poor maintenance and are repeats of previous violations, so obviously the lesson was not learned. These violations and the pollution they cause may go on for months before being detected by an inspector. If you look at the dates on the Notices of Violation you will also see that there are months between the time a violation is found and a citation is issued. In the case of HSC's failure to evaluate the performance of its opacity monitors and the failure of these monitors to provide an alert in September 2022 when particulate emissions were twice the allowable limit, the resulting violations (which have still not been issued a year later) only cover the months between detection and resolution, while pollution exposure may have gone on for as long as two years.

The health impacts of biomass pollution are well established and should not be taken lightly. In addition to the additional 7-8 emergency room visits per month for lower respiratory conditions which Dr Stockton described, other health impacts from biomass pollutants well documented in the literature include elevated rates of cancer, adverse birth outcomes, neurodevelopmental harm, heart attacks and strokes, hospitalizations, and premature deaths. It is not necessary to do a separate study of each community with a power plant to determine if these harms are occurring. The relative risks of different adverse health outcomes from pollution exposure have been established from studies of very large populations over long periods of time, repeated in many different places. These risk ratios can be applied anywhere and are more valid than a local study of a small population where an impact has to be really really bad for results to reach statistical significance. There are well established epidemiological methods for taking known quantities of emitted pollution, applying air dispersion models, relative risk ratios, and population demographics to determine health impact. When this was done for the Scotia plant emissions using EPA's Co-benefits Risk Assessment Tool, the result was an estimated \$3-7 million a year in health damages. (EPA, 2023).

Neither should violations be glossed over as routine. During the same time period that Humboldt Sawmill Company racked up hundreds of violations, the gas fired Humboldt Bay Generating Station had zero. I've submitted a public records request to the Shasta County AQMD, which has several biomass facilities in its jurisdiction, to see how HSC compares with these other biomass plants, and will report back once that information is obtained.

Regulatory compliance can't be conflated with safety. The federal emission standards for biomass plants were never designed to be health protective. They are based on the best that facilities using inherently dirty technology can do. The EPA sets its standard as the average emissions from the “cleanest” 12 percent of biomass plants. That average results in allowable emissions which exceed those for coal plants. That is a lot of pollution, but there is actually no threshold below which these pollutants are safe, so even when a biomass plant is fully compliant, it still emits amounts enough pollution which cause all of the health impacts listed above.

Enforcement is not guaranteed. Enforcement of state and federal laws regarding power plants is delegated to regional air quality management districts like the North Coast Unified AQMD, whose small staff covers three counties. The relevant state law for biomass is the Toxic Hot Spots Act which requires reassessment every four years of community health risk from a facility's toxic pollutants (CARB, 2023). Biomass emits air toxics such as benzene, dioxin, and polycyclic aromatic hydrocarbons. When I first started researching HSC's compliance in 2022, I discovered that this Air Toxics law had not been enforced locally for over 20 years. As the biomass plant's emissions increased and its priority score rose from 79 in the year 2000 to 5,999 in 2020, no health risk assessments were ordered and no annual reports to the public were issued, although both are required by state law.

While visiting Shasta County's AQMD website to submit the aforementioned public record request about violations from their biomass plants, I learned that Shasta has been doing much better at enforcing the Toxic Hot Spot law. Of the 4 biomass plants they've re-evaluated in recent years, three were required to submit Health Risk Assessments and were found to have levels of toxic emissions which pose high risk to their communities.

Last year, after considerable agitation on my part, NCUAQMD finally made a move toward enforcing the Air Toxics law, but instead of ordering a Health Risk Assessment as Shasta's AQMD has done, NCUAQMD gave Humboldt Sawmill a chance to develop a new method of counting their toxic emissions, with the idea that reporting lower toxic emissions would obviate the need to assess health risk. Instead of adopting the state sanctioned methods of either directly measuring toxic emissions in exhaust or using the state's own toxic emissions factors, HSC cherry-picked some data to create emissions factors which would have made their toxic pollution appear ten times lower than the other methods. This was too much even for NCUAQMD, which rejected the plan; but 11 months later, there is still no plan, which further delays the prospect of obtaining a Health Risk Assessment. Due to statutory deadlines which allow the air district and facilities months to complete each step of the process, it can take as long as 8 years for a facility with proven health harm to decrease its toxic pollution.

There is simply no way around the fact that biomass combustion is dirty energy. Dirty energy requires a degree of regulatory vigilance and operational commitment to public health that are simply lacking in Humboldt County. HSC's repeated violations for failure to maintain continuous monitoring and pollution control equipment, and its attempt to lowball its toxic emissions demonstrate the company's lack of care for the community. NCUAQMD's chequered history of air toxics enforcement and the length of time it takes for the regulatory process, even under the best circumstances, to result in air toxics pollution mitigation provide a reality check on how much protection we can expect from that quarter.

RCEA can drop biomass before 2030. The 2017 PPA contract between HSC and RCEA provides for early termination in the event of violations and misrepresentation by HSC. (RCEA, 2017). There is no question that these have occurred. While there may be a shortage of clean alternatives at the moment, there is more than enough clean energy coming online in the near future to replace biomass in RCEA's renewable portfolio long before the contract expires in 2031 (CAISO, 2022). Current and projected PPA prices for clean energy are no more expensive than the \$68 per megawatt hour currently paid for biomass (Level Ten, 2023). The vast majority of projects in the pipeline include energy storage so there will be alternatives for firm power and RA.

Taking a stand matters. While dropping biomass won't prevent HSC from continuing to generate and sell its dirty power to other buyers, the reputational damage of being dropped by a CCA due to multiple environmental violations will limit the pool of buyers and lower the price HSC can command. This will provide HSC a much needed push toward moving on to cleaner alternative uses for their mill waste.

No more studies are needed. The question for Directors is simple. Are the benefits of having this biomass plant in RCEA's renewable portfolio worth the health harm and global warming it causes? Please do not waste RCEA's money on an unneeded air quality study or use such a study as an excuse to delay taking action on keeping RCEA's commitment to 100% clean energy.

Thanks for your patience with this long comment and your continued attention to this issue.

Wendy Ring MD, MPH

REFERENCES

CAISO. Briefing on renewable and energy storage in the generator interconnection queue. July 2022. <https://www.caiso.com/Documents/BriefingonRenewables-RenewablesintheGeneratorInterconnectionQueue-Memo-Jul2022.pdf>

CARB, AB 2588 Air Toxics Hot Spots. 2023 <https://ww2.arb.ca.gov/our-work/programs/ab-2588-air-toxics-hot-spots>

EPA Co-Benefits Risk Assessment Tool <https://cobra.epa.gov/>

Level Ten PPA Price Index Q3 2023 https://go.leveltenenergy.com/l/816793/2023-10-16/37vfz7/816793/169747170949GYjDTA/2023Q3_NA_PPAPriceIndex_Executive_Summary.pdf

NCUAQMD Notices of Violation 2017-2023

https://drive.google.com/drive/folders/1sBEOog0MBYvSd_S7oYMefh60w5Phv97T?usp=share_link

Shasta County AQMD 2023 Air Toxics Report

https://www.shastacounty.gov/sites/default/files/fileattachments/air_quality/page/2408/2023_ab_2588_annual_report_br.pdf

RCEA 3-20-17 PPA with HSC

https://drive.google.com/drive/folders/1tbRTRlyJRAy5vZhIxRsOAovW7Kh9m5Cb?usp=share_link

Ring, W. Slide Deck RCEA 8-20-23 https://docs.google.com/presentation/d/1ZMzScX-UDjoyWf-m_f6KD6KWm0NeJhCr/edit?usp=share_link&ouid=102704382971298102137&rtpof=true&sd=true

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3.0 - Oral/Written Communications

From: [Wendy Ring](#)
To: [Public Comment](#)
Subject: addendum to previously submitted comment
Date: Wednesday, October 25, 2023 4:31:22 PM

This is the information I promised in the comment I submitted earlier comparing regulatory compliance of Humboldt Sawmill's biomass plant with those in Shasta County.

Violations from biomass plants in Shasta AQMD 2017-2023

Burney Forest Products

V20-0456 1 emissions exceedance in 2020

Sierra Pacific Anderson

V22-0084 28 exceedances of CO in Jan 2022

V22-0212 20 exceedances of CO in April 2022

V23-0118 burned fungicide treated wood chips 36 times

Sierra Pacific Shasta

V22-0311 Failed source test for pm

Sierra Pacific Burney

V19-0239 failed to conduct RATA under proper conditions

Sustainable Resource Management Shasta

V23-0107 1 fuel pile too high

Wheelabrator Shasta

V20-0314 Failed to calibrate CEMS on one day

Violations from HSC biomass plant 2017-2023 (only violations incurred during those years are included)

Key: CO exceedances indicate increased emissions of air toxics. Opacity exceedances indicate increased emissions of

fine particulate matter.

2017

NOV 160206 4 CO exceedances

NOV 160207 7 CO exceedances

NOV 160208 48 opacity (pm) exceedances over 8 days

NOV 160209 88 opacity exceedances over 13 days

2018

NOV 13228 fly ash silo leaking dust – poor maintenance

NOV 13229 another fly ash silo leaking dust- poor maintenance

NOV 13230 boiler leaking dust- poor maintenance

NOV 13231 bucket elevator leaking dust- poor maintenance

2020

NOV 13193 fly ash silo leaking dust

NOV 13625 1 CO exceedance

2021

NOV 13265 1 CO exceedance

NOV 13268 3 CO exceedances

NOV 13269 equipment leaking fugitive dust

NOV 13231 bucket elevator leak – poor maintenance

NOV 13330 dust leak in boiler auger- poor maintenance

2022

112 Violations of particulate emissions (plant notified but not yet formally issued) for 2 boilers failing stack test and the number of days it took to repair and pass repeat test. This is the result of poor maintenance of pollution control equipment.

2023

NOV 14032 failure to report boiler breakdown

NOV 14038 CO exceedance 3 in 3 days

NOV 14045 opacity exceedance 24 hour*

NOV 14046 opacity exceedance 24 hour* for 3 days

NOV 14047 2 opacity exceedances in 1 day

NOV 14048 1 opacity exceedance

NOV 14049 opacity exceedance 24 hour* for 3 days

NOV 14203 opacity exceedance 24 hour* for 1 day

* the air district only started issuing violations for exceeding 24 hour opacity limit after I brought this part of the Clean Air Act to their attention.

I do not think the difference in violations between HSC and biomass plants in Shasta County is due to less diligent enforcement because Shasta AQMD is years ahead of NCUAQMD at complying with state Air Toxics regulations. They also responded to my request for public records in days, compared to NCUAQMD which always takes the maximum time allowed by law.

Please note that Matthew Marshall and Richard Engels were notified about the plant's poor compliance history last year as soon as I became aware of it, yet continue to minimize HSC's pollution and compliance issues in their communications with the public. I am sympathetic that RCEA doesn't have the resources for staff to develop expertise in biomass plant regulations but, given that limitation, they should refrain from misinforming or misdirecting public attention from this serious issue.

A strong argument can be made that if RCEA lacks the resources and the will to monitor practices in its supply chain, it should avoid contracting for energy from sources at high risk of causing health and environmental harm.

Wendy Ring MD, MPH

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