

CHALLENGES AND SOLUTIONS TO PERMITTING PYROLYSIS TO BIOCHAR PROJECTS

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Topics of Discussion



Pyrolysis to biochar



Other related methods
in making biochar



What requires
permitting?



State and
regional/local air
quality permitting



Effects of the Federal
Incinerator Rules



What are some
solutions and potential
path(s) forward?

TSS Consultants

- ▣ What we do – “All Things Biomass” since 1986
- ▣ Bioenergy, biofuels, and bioproducts
- ▣ Project Development Consultants
- ▣ Clients include:
 - public and private sector
 - municipal and investor-owned utilities
 - Numerous tribes and NGOs
- ▣ We conduct for this wide variety of clients:
 - Feasibility and siting studies
 - Technical studies and technology evaluations
 - Financial and economic studies
 - Loan guarantee application support studies
 - Environmental permitting (land use, air, GHG's, water/wastewater, and more)
 - Feedstock assessment and procurement
- ▣ Several years to date in the biochar sector

Pyrolysis to Biochar



Pyrolysis systems converting biomass to biochar almost always need air permitting at minimum.



This includes gasification systems as well.



All pyrolysis system do have at least one air emission point no matter what people try to tell me (think standby flare for example).



Air emission points that release air pollutants such as NO_x, SO_x, CO, VOCs, and PM may need controls which may need air permits from the local, regional, and state agencies, and even the U.S. EPA



The potential for U.S. EPA regulations to come into play is one of the reasons I am here today

Other Methods of Making Biochar



Air Curtain Burners (ACB)



Flame Cap Kilns (Kilns)



Both are basically combustion units



Why am I talking about these as well?

They make biochar from biomass
They can have permitting exemptions
Simpler permitting/approval pathways
There are regulatory carve outs

State, Regional, and Local Air Quality Permitting

Some states have one air quality agencies, while California has 37 regional and local districts.

What is asked of permitting depends on the jurisdiction, the size of the unit, and their relative emissions.

In the case of ACBs and kilns many air agencies and districts see them as open burning, subject to open burning controls and time periods.

Others may want them permitted as a potential stationary source.

Almost all will agree that since both ACBs and kilns can significantly lessen particulate matter compared to open pile burning. Plus, they make biochar.

The Federal Incinerator Rules

The U. S. Clean Air Act Section 129 directs the EPA to limit emissions from solid waste incinerators. Emissions included are CO, SO_x, NO_x, and PM.

There was the development of regulations covering Commercial and Industrial Solid Waste Incinerators (CISWI) and Other Solid Waste Incinerator (OSWI), which include pyrolysis/combustion units. Gasification units get pulled into this as well.

Thus, pyrolysis systems are considered by the EPA as solid waste incinerators and can potentially carry all the regulatory baggage and poor "optics" that "garbage" burners do.

In August 2020, proposed to modify the OSWI definition of municipal solid waste combustion units which would have removed pyrolysis units from the definition and from being considered incinerators

This was the right step in making sure biomass conversion by pyrolysis (and gasification) is NOT incineration. **However...**

Advanced Notice of Proposed Rulemaking



The EPA received many adverse comments regarding the removal of pyrolysis units from the OSWI rules, prompting the probably in part to issue the ANPR for potential future regulations addressing pyrolysis and gasification units



In addition, these adverse comments led to the EPA rescinding the proposal to remove pyrolysis system in May 2023.



Somewhat concurrent with the pyrolysis proposal, EPA issued an ANPR for Potential Future Regulation Addressing and Gasification Units, in September 2021 to gain knowledge about pyrolysis and gasification. Information and comments were to be received by 12/23/21.



174 comments received, many still adverse but focused on non-wood wastes. However, some were focused on wood, particularly forest wood waste.



Since the comments were placed in the EPA docket, nothing public has been released about the progress of the rulemaking. So, the EPA incinerator rules continue to apply to pyrolysis to biochar projects.

40 CFR Part 60

Subparts CCCC & EEEE

If an air quality state agency or local/regional air districts believes a pyrolysis system must abide by the incinerator rules, it can be an onerous task for some.

Incinerator new source performance standards contain the eleven major components listed below:

- Preconstruction siting analysis;
- Waste management plan;
- Operator training and qualification;
- Emission limitations and operating limits;
- Performance testing;
- Initial compliance requirements;
- Continuous compliance requirements;
- Monitoring;
- Recordkeeping and reporting;
- Definitions; and
- Tables.

What Can Be Done?

Number 1 – Get the Federal rules changed. Pyrolysis is not combustion! If they can't do that, they then need to focus on the feedstock.

Live with the onerous Subparts CCCC and EEEE (if invoked). Large facility probably can, but for small facilities could be tough.

Ask for a possible exemption – this can be a slow process as we've found.

Don't bring up to air agency – maybe they won't do it for pyrolysis to biochar (there is risk here if permitted). If they do, they could be "softer" on compliance. Some states may have their own regulatory strategy to stay out the Federal rules.

Consider your feedstock strictly as a product, not a waste. This is easier to with woody biomass as it has to be processed first before being used in the pyrolysis system. This has been employed by the woody biomass direct combustion power plant sector.

Questions and Comments?



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