

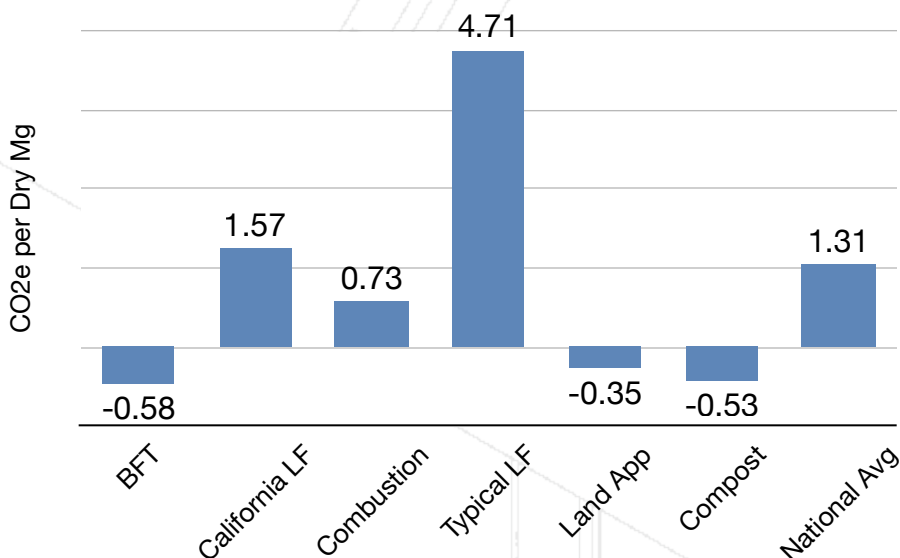
Greenhouse Gas Emissions Assessment of BioForceTech's Pyrolysis System for Biosolids Management

Summary of the original study by Northern Tilth (Belfast, Maine 04915)

Introduction:

On March 31, 2021, Northern Tilth finalized an in-depth study of the Green Gas Emissions impact of the Bioforcetech biosolids transformation technology. The study focuses on comparing six current disposal practices of Biosolids and the Bioforcetech system. The calculations, which utilize the BEAM model, show that the Bioforcetech technology has the greater GHG sequestration impact comparing to all other disposal practices, with a national average of 1.89 tons of CO₂ sequestered per ton of biosolids treated (dry basis). This document summarizes the results of the paper.

BEAM Results: net emission / Ton of biosolids:



This chart illustrates GHG emissions on a per dry metric ton (Mg-dry wt.) basis. A detailed description of the scenarios is included in the full article.

It is important to note that biogenic CO₂ is not included in the CO₂ emissions calculated in this report. Biogenic carbon emissions represent short-term carbon that has recently been pulled from the atmosphere and incorporated into plants, as opposed to CO₂ emitted from the combustion of fossil fuels, a long-term source of carbon.

CO₂ sequestration per ton of OurCarbon™ Biochar produced:

The Bioforcetech technology reduced the volume of biosolids by 90% when transforming a 20% solid content Class B Biosolids into a high quality, nutrient rich Biochar (OurCarbon™ Biochar). On a national average basis, the carbon sequestration potential is **3.78 tons of CO₂e / ton of Biochar**. When compared to a typical US landfill (with methane capture) the potential is **10.58 tons of CO₂e / ton of Biochar**.

Summary:

“Results from Northern Tilth’s modeling of GHG emissions from BFT’s pyrolysis technology indicate that the technology provides a net negative carbon footprint for biosolids management, similar to, and in some scenarios, lower than existing beneficial use options for biosolids. As with other beneficial use options, BFT’s pyrolysis technology provides for the carbon benefits associated with sequestering carbon in soil and replacing chemical fertilizers with organic matter-derived soil fertility. Most significantly, BFT’s biodrying process provides for an energy neutral process to allow for a moist material to be pyrolyzed and provide the benefits associated with both mass reduction and reduction of organic contaminants that are sometimes present in biosolids.” Northern Tilth