



Waste to Fuel/Energy Pyrolysis Safety Assessment

March 19, 2026

It is understood that the health and safety of employees and the host communities they serve should be the most important consideration for all industrial operations. It is imperative that industrial systems are designed and operational procedures are followed to mitigate risk of accidents and injuries to the workers and safeguard the communities in which industrial facilities are located.

Context is important if a candid and accurate assessment regarding pyrolysis industrial health and safety is to be assessed, thus we offer the following facts:

The proposed E3i BioRefinery® waste to fuel/energy plant is designed to be a mitigating replacement for all three (3):

1. MSW Landfilling Operations
2. MSW Mass-Burn Incineration Operations
3. Fossil Fuel Refining Operations

It is generally accepted that all industrial operations present a work environment that can be dangerous and thus equipment design protocols and employee operational standards must be strictly followed. Heavy equipment, machinery, chemicals and flammable liquids and gases each require industrial operations to place safety protocols first among all priorities.

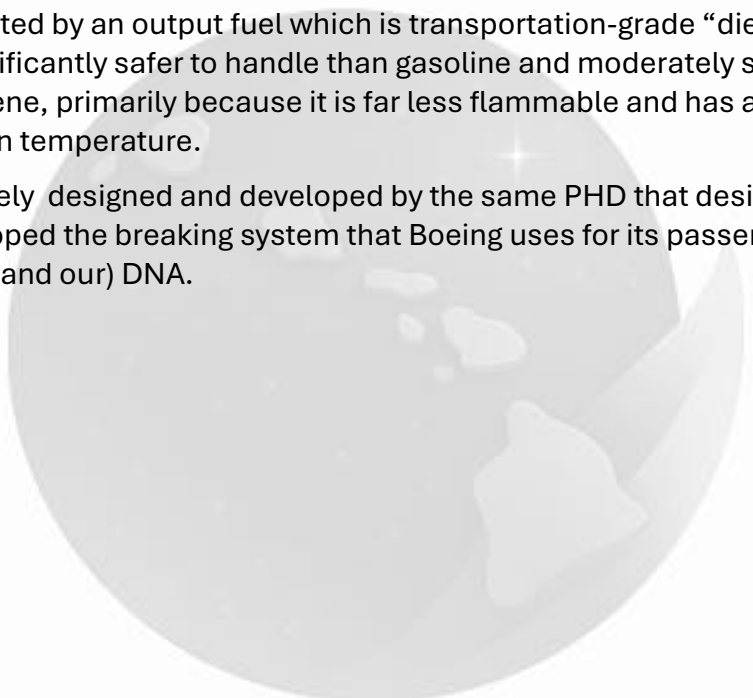
In this context we have evaluated the safety record of waste pyrolysis as a stand-alone industrial operation as well as compared to the industrial operations it replaces.

- I. It is largely an accepted fact that the current USA (OHSA) (and State of Hawai'i - HIODH) health and safety standards are among the highest in the world. *(In many cases they are considered significantly stricter than the standards of many other nations globally).*
- II. In the past 50-years, the number of global pyrolysis related accidents resulting in employee fatalities "globally" is estimated to be several dozen. . *(Note: many countries are not as pragmatic in reporting and categorizing industrial accidents as is the case in the USA.)* Interestingly, most of these accidents happened at waste tire pyrolysis processing facilities.
- III. In the past 50-years there has been only one (1) serious injury accident at a Texas pyrolysis facility in the USA. The system was a batch feed, tire processing facility,

where end-of-life passenger and industrial tires were heated with vapor gas (Natural Gas, Propane and/or Syngas and Open Flame), resulting in an explosion injuring two employees, one of which subsequently died.

- IV. By comparison, over the same 50-years in the USA, the number of serious accidents at MSW waste landfills significantly larger, but hard to aggregate. Extrapolated data from OSHA/BLA, records suggest that over the same 5 decades the number life-altering injuries at USA landfills due to methane explosions, major fires, slope failures, and heavy-equipment incidents is estimated to be 200+/-, with fatalities estimated to be several dozen, 24+/- *In context: there are 1,200+/- MSW landfill operations in the USA.*
- V. By comparison, over the same 50-years in the USA, the number of serious accidents at Oil Refineries is estimated to be in the 1,000s, with fatalities over the same time to be estimated at 500+/- *In context: there are 130+/- oil refinery operations in the USA.*
- VI. Threads of similarity: Most pyrolysis accidents globally have several things in common. They were:
 - Operated at facilities outside of the USA, without OSHA plant and employee health and safety standards
 - Tire (end-of-life) processing facilities
 - Systems requiring manual oxygen purge processes in between batch processes
 - Batch feed systems requiring the heating units to be opened to accept employee-feed new tire feedstock (appears to be the cause of most pyrolysis accidents)
 - Conversion chambers heated by vapor gas; Specifically Natural Gas, Propane and/or Syngas and Open Flame
 - Novel systems that did not have extensive operating histories or safety protocols/records
- VII. Dissimilarity with the E3i BioRefinery® USPTO patented pyrolysis system. Our E3i pyrolysis system is:
 - Designed and operated in the USA following strict OSHA plant and employee health and safety standards
 - Processing highly-stable MSW sold-fuel engineered pellets (similar to a wood pellet)
 - Supported by nitrogen purge systems which are system controlled and operator monitored, but do not require manual intervention
 - A mechanical continuous feed system not requiring the heating unit to be opened nor requires employee intervention to receive precisely-metered MSW pelletized feedstock

- Supported by a pyrolysis conversion chamber which is heated with induction electricity...no Natural Gas, Propane and/or Syngas and absolutely no Open Flame is required
- A pyrolysis conversion system developed, tested, patented and installed in the USA in 2012. It has been in continuous operation in Tennessee since 2013, logging over 13,000 hours of incident free operation.
- Complimented by a Stellar Safety Record: Over the past 13 years, our pyrolysis conversion system has never had a catastrophic failure or employee injury.
- Benefited by an output fuel which is transportation-grade “diesel fuel.” Diesel is significantly safer to handle than gasoline and moderately safer than kerosene, primarily because it is far less flammable and has a much higher ignition temperature.
- Uniquely designed and developed by the same PHD that designed and developed the breaking system that Boeing uses for its passenger jets. Safety is in his (and our) DNA.



GENESIS OAHU

WASTE CONVERSION

Hō'ola Hou i ka 'Ōpala