

Autothermal Pyrolysis

The latest breakthrough in thermal deconstruction of biomass to biofuels and biochemicals at the ISU Bioeconomy Institute is an intensified process called autothermal pyrolysis.

Autothermal pyrolysis provides the energy for pyrolysis through partial oxidation of pyrolysis products within the reactor, thereby eliminating the heat transfer bottleneck of conventional pyrolysis.

Simpler Process, Higher Yields

Autothermal pyrolysis has four advantages:

- Simplified reactor design, removing the need for external gas.
- Process intensification, increasing outputs of desired products with fewer inputs.
- Higher yields of bio-oil, organics, and sugar.
- Reduced capital costs of more than 25%.

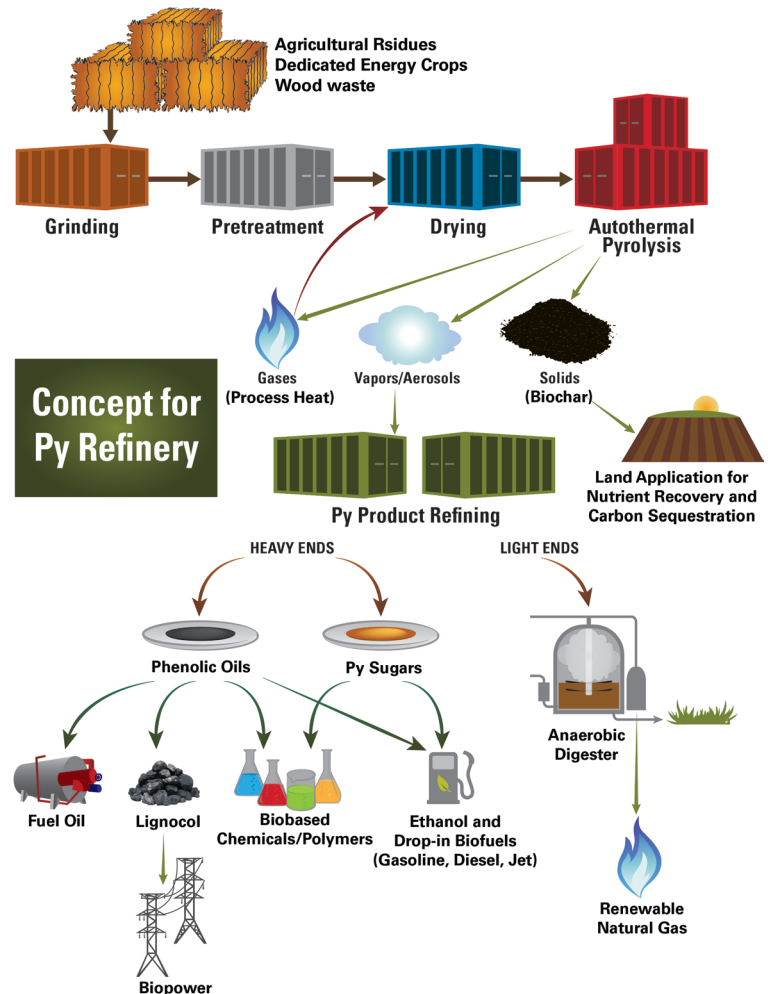
The bio-oil is recovered in fractions, a patented BEI technology, to produce:

- Sugars, which can be fermented to alcohol.
- Phenolic oils, to produce Lignocool (a coal substitute) and drop-in biofuels.
- Aqueous phase, converted to renewable natural gas.

Pyrolysis also produces biochar, a soil amendment and carbon sequestration agent.

Proving it on a Commercial Scale

BEI is working to prove the technology works on a commercial scale with our Modular Energy Processing System, or M.E.P.S. It's being accelerated by the DOE-funded RAPID Institute, the country's tenth Manufacturing USA initiative. BEI has teamed with Easy Energy Systems, a leading developer of modular systems, and Stine Seed, the nation's largest independent seed company, on the project. The Iowa State University Power Plant will co-fire coal and Lignocool to generate electricity and reduce coal usage.



Autothermal pyrolysis is central to BEI's concept for a "py refinery," a modular system to produce biofuels and biochemicals.

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