

Overview of ATP-PA's Demonstration of a Patent-Pending Combined Remediation Biomass & Bio-Product Production (CRBBP) Process

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Problems & Opportunities!!!

Nutrient Pollution in the Chesapeake Bay Watershed:

- There are excessive amounts phosphorus (P) which drain from Pennsylvania's farms into the Chesapeake Bay, damaging the ecosystem, due to extensive use of chicken litter fertilizer.

Industry:

- Industry is looking for non-fossil materials that are better, easier to convert, use, or process into superior bio-products.

However, Some Bio-Products Are Too Expensive:

- There is a need to reduce the cost of biomass.

Lower Costs Will Increase the Use of Bio-Products:

- Using bio-crops and their biomass, multiple times, will reduce costs and facilitate the greater use of bio-products.



ATP-PA's Triple-Bottom-Line Approach

ATP-PA, LLC (ATP-PA), the Pennsylvania operating affiliate of Agri-Tech Producers, LLC (ATP), will use cost-effective, combined processes to sustainably grow, use and convert bio-crops, and will:

- **Enhance Pennsylvania's environment and quality of life,**
- **Locate its operations in rural communities, where possible, to create jobs and to improve local economic conditions, and**
- **Make reasonable profits for itself and its investors.**



ATP's Combined Remediation, Biomass & Bio-Product Production (CRBBP) Process

Under ATP's **patent-pending**, multi-step process, an allotment of **bio-crops and their biomass** is used **multiple times**, as described below , **reducing overall costs**:

- **Polluted areas** are cost-effectively cleaned up, by growing special bio-crops in them, whose **roots' phytoremediation properties remove problematic substances**; then
- **Once harvested**, the bio-crops are shredded and used, as is, as **poultry house bedding**, with the **resulting litter** later **converted** into a **rich, biochar soil amendment**; or the biomass is **converted** into **fillers** used to make **lighter, stronger and heat and water-resistant plastics**, or a variety of **other bio-products**.



ATP-PA's Demonstration Project

ATP-PA, is partnering with **others**, to demonstrate ATP's new, cost-effective and patent-pending **CRBBP Process**, to reduce excess levels of **phosphorus** in Pennsylvania's Chesapeake Bay watershed farm soils, and convert the resulting, **lower-cost biomass** into a **variety of bio-products** and **bio-fuels**.

If all goes well, ATP-PA will develop **commercial-scale CRBBP Process operations** throughout the Region's Chesapeake Bay watershed.



ATP's CRBBP Process Both Remediates & Lowers Costs!!!

ATP's Patent-Pending CRBBP Process
Simultaneously:

1. Cleans up **P-Contaminated Farmland**
2. Reduces **Biomass Feedstock Costs**
3. Produces **Renewable Bio-Products**
4. Creates a **Cleaner & Safer Environment**
5. Saves an **Enormous Amount of Money**
6. Creates **Jobs** and Generates **Profits**



“Biomass Sorghum’s” Super Phytoremediation Powers



Standard Sorghum



“Biomass Sorghum”



A Maryland Eastern Shore Field of ATP-MD's "Biomass Sorghum"



Agri-Tech Producers, LLC



ATP's CRBBP Process Lowers Remediation & Bio-Product Costs!!!



Phytoremediation: A low-cost, way that plant and tree roots remove toxins from soils, water, etc.



Torrefaction: A pyrolytic process that converts biomass into enhanced bio-products, like clean/renewable bio-coal.

Combined Process = Much Lower Costs

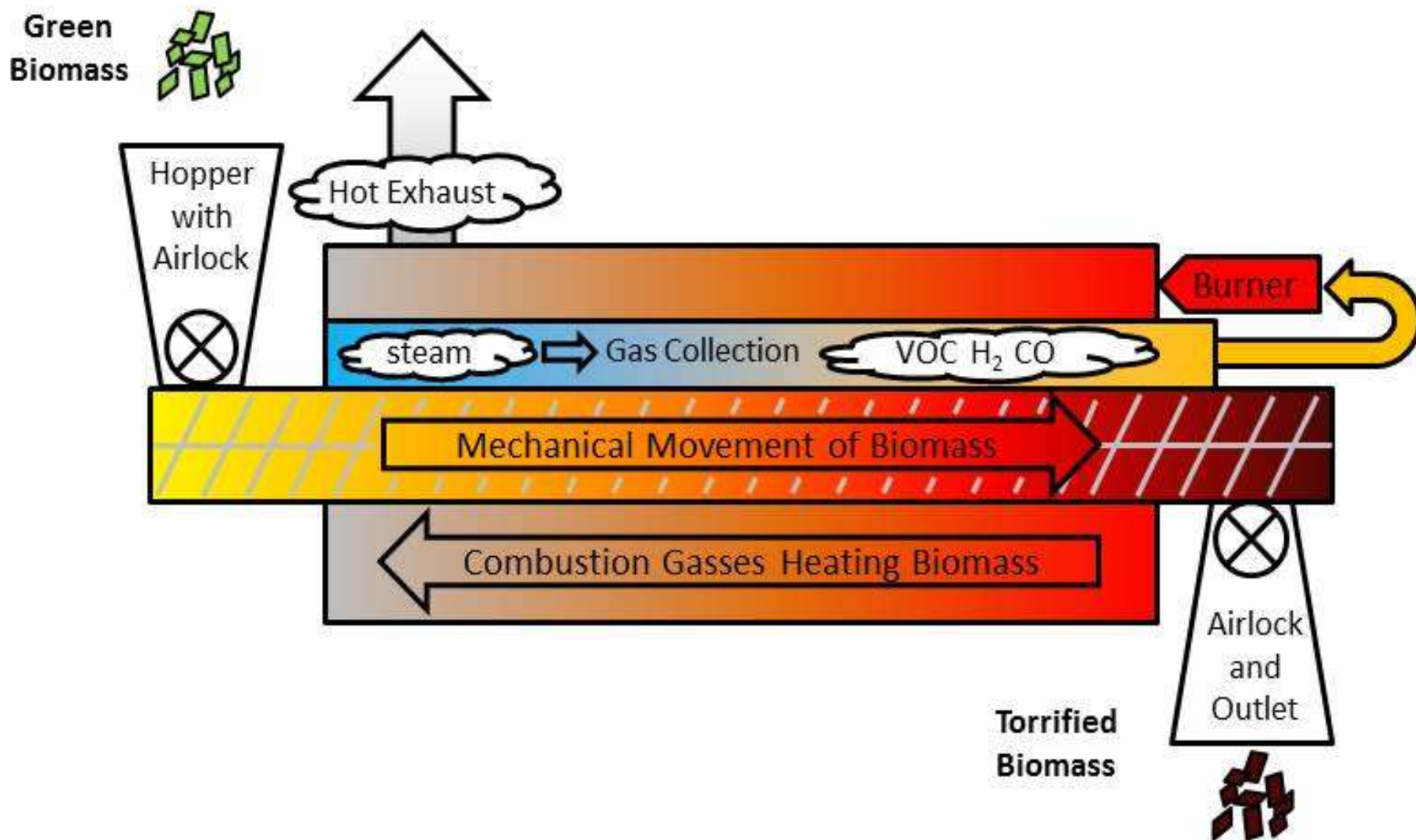


ATP's Torrefaction Process

- ATP's **Torrefaction Process** involves **Heating** animal, plant or wood material (**Biomass**), in a **low-oxygen** environment (), which evaporates the material's water, Volatile Organic Compounds (VOC's), and some Hemicellulose (HC).
- In ATP's patented process, the VOC/HC gases are **Captured** and **Combusted** to cost-effectively and with minimal environmental impact, generate "**Variable**" **Process Heat**.
- **Pyrolyzed Biomass** can be used to make a variety of **Bio-Products**: e.g. **Biochars**, for more productive soils; **Fillers** used to make better-performing **Plastics**; and **Bio-Coal**, which can be co-fired with coal in power plants, to reduce **GHG emissions and pollution**.



Schematic of ATP's Torrefaction (Pyrolysis) Machine



ATP-PA's Product Line

ATP-PA will produce the following bio-products:

- **Poultry House Bedding:** A locally-produced, lower cost, but more absorbent bedding.
- **Enhanced Plastics Fillers:** Make stronger, lighter and heat/water-resistant plastics.
- **Biochar Soil Amendments:** Increase the productivity and water-efficiency of poor soils.
- **Other Bio-Products & Bio-Fuels:** ATP is involved in the development of other bio-products and bio-fuels, which will reduce chemical and carbon pollution.
- **CRBBP Process:** Cost-effectively remediates sites, while making the aforementioned products.



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