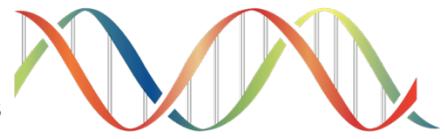




Community BioRefineries
The Epitome of American Innovation



By Scott Hewitt CEO and Vincent R. James Ph.D. CTO
Community BioRefineries, LLC |

Energy Weaves Through Every Molecule, Eternal and Unbound: Unlocking Agricultural Abundance into Treasure for a Sustainable Future

*"We cannot create or destroy energy, but we can change it from one form to another."
~Sir Isaac Newton (paraphrased and applied to thermodynamics)*

*"Use Everything - Waste Nothing"
~ Scott Hewitt, CEO of Community BioRefinery*



Imagine a world where every component of the corn crop - root, stalk, leaf, husk, cob, and kernel - is meticulously utilized, with every molecule transformed into a vital thread in a vibrant tapestry of sustainability. At the Community BioRefinery (CBR), the oldest biofuel research and development company in the U.S., as recognized by the USDA, no part of the corn plant is wasted or composted. Through advanced bioprocessing, lignocellulosic root and stalk biomass is converted into the next generation of biofuels and hydrogen, while kernels yield high-purity plant protein isolates, resistant starches, and high oleic oils. Husks and cobs are

processed into biodegradable bioplastics, ensuring zero residual waste. Guided by Sir Isaac Newton’s first law of thermodynamics - “We cannot create or destroy energy, but we can transform it from one form to another”—and CEO Scott Hewitt’s mantra, “Use Everything, Waste Nothing,” CBR redefines agricultural resource efficiency. This integrated biorefinery model transforms communities into hubs of a circular economy, where corn’s molecular abundance fuels homes, enriches farms, and powers industries with biofuels, proteins, and sustainable materials, advancing a resilient, thriving planet.

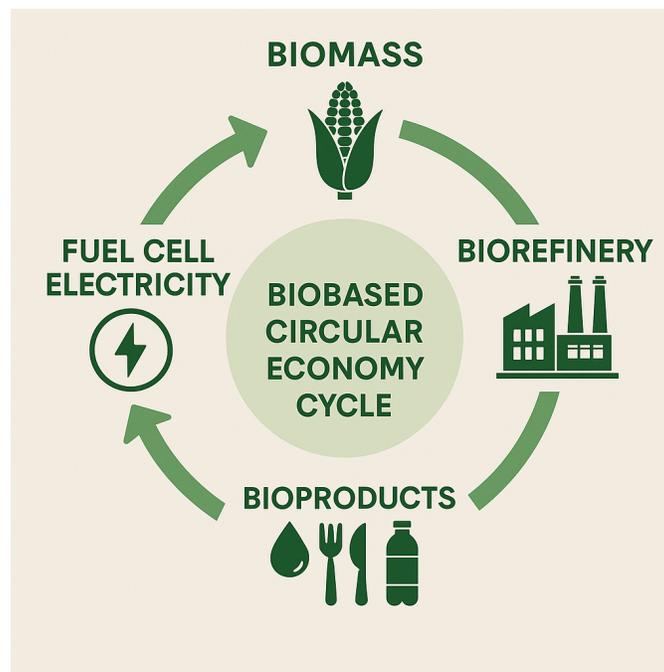
In this blog, we’ll unravel the science, art, and spirit of CBR and its Hemp-BioRefinery (HBR) division, exploring how they transform molecular energy into celestial treasure. From micronizing feedstocks to crafting bio-butanol, we’ll weave through CBR’s zero-waste processes, innovations, and global impact. Ready to discover how every molecule matters? Let’s dive into the cosmic loom.

The Cosmic Loom: Weaving Molecular Energy

“CBR is the true and original biobased circular economy company, utilizing every molecule to fuel and feed the world.” — Community BioRefinery Mission (www.communitybiorefinery.com)

Newton’s creed - “We cannot create or destroy energy, but we can change it from one form to another”—is the heartbeat of CBR. As the first law of thermodynamics, it reveals that energy is eternal, flowing through the covalent bonds of corn, soy, or hemp. Scott Hewitt, CBR’s visionary CEO, channels this truth, ensuring zero waste and zero pollution in a process that rivals the petroleum industry’s ingenuity.

What is a biorefinery? Unlike the common misconception that “it’s just an ethanol plant”, a biorefinery, per the USDA, transforms biomass into a spectrum of products—fuel, food, plastics, and more. CBR takes this further, creating a biobased circular economy where every molecule of feedstock is rewoven into vibrant assets. From Iowa’s cornfields to California’s rice paddies, CBRs are art studios, where communities paint with energy’s eternal palette, crafting sustainable futures.



Scott Hewitt: A Modern Newton Weaving Molecular Laws

Scott Hewitt is CBR’s modern Newton, applying the first law to create a world where no molecule is wasted. Just as Newton’s laws unveiled the universe’s order, Hewitt’s vision - “Use Everything - Waste Nothing”—transforms corn stalks (and all other plant source materials) into bio-butanol, hemp seeds into protein isolates, and cheese

waste into electricity. His leadership mirrors Newton's genius, turning theoretical energy conservation into practical, scalable solutions.

"Hewitt's mantra is Newton's creed in action: every C-H bond is a thread of possibility."

~CBR Team

Hewitt's insight, validated by a third-party engineering review and USDA financial models projecting \$30M+ annual revenue per facility, redefines sustainability. Like Newton's Principia, CBR's processes—micronization, fermentation, hydrogen capture—are a paradigm shift, replacing petroleum's "bottom of the barrel" with a zero-waste tapestry. Hewitt, the master weaver, invites communities to join this revolution, proving that energy's eternal weave can reshape our world.

From Food Science to Celestial Vision: Threading the Tapestry

CBR's journey began with Hewitt's Food Science and Technology expertise, a loom for weaving molecular energy. His vision—to empower communities through a global network of CBRs and HBRs—sings of a revelation: energy weaves through every molecule, eternal and unbound. Let's explore how Hewitt's background shaped this cosmic mission.

A Foundation in Molecular Alchemy

Hewitt's academic odyssey unveiled the potential of feedstocks. Corn's biomass, with glucose chains linked by C-O-C bonds (358 kJ/mol), stores 4,500 MJ/ton. Hemp's proteins, with peptide bonds (C-N, 305 kJ/mol), hold 3,800 MJ/ton. These covalent bonds, formed by shared electrons, are threads of eternal fire, ready to be rewoven into biofuels or nutrition.

Newton's wisdom inspired Hewitt's experiments: could the Hybrid Corn (Heart Friendly) and Industrial Hemp's lipid C-C bonds (347 kJ/mol, 37 MJ/kg) become high-oleic oils? Could the biomass' lignin power fuel cells? The mantra "Use Everything - Waste Nothing" took root, envisioning CBRs as art studios wherein communities craft sustainable masterpieces. Explore CBR's science concept paper (communitybiorefinery.com/concept-paper/).

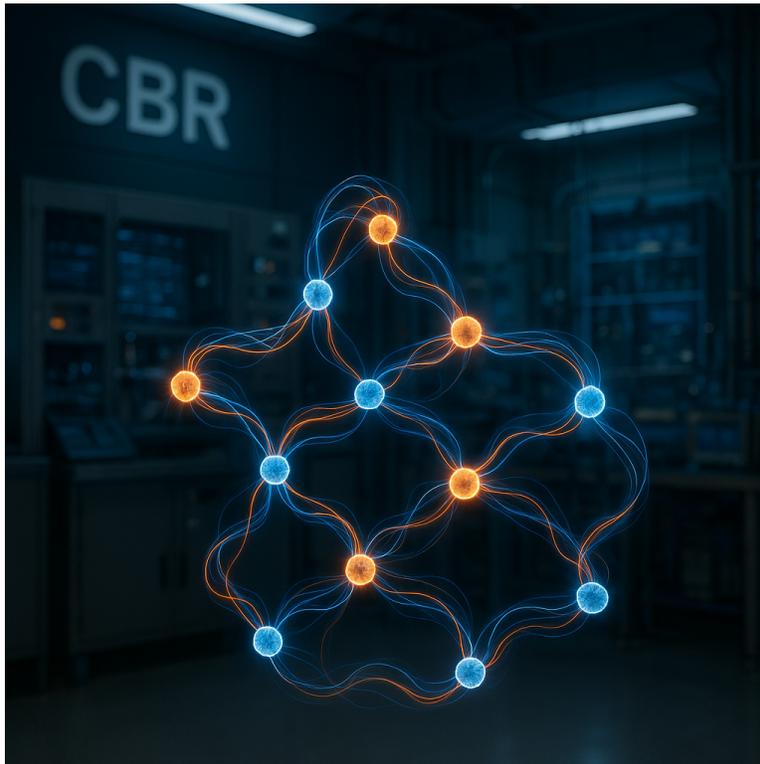
Leading the Biobased Revolution

Hewitt's vision birthed CBRs and HBRs, localized studios that reweave feedstocks into vibrant assets. He saw the Hybrid Corn and hemp seeds as protein matrices and corn/hemp stalks as cellulose threads for bio-butanol. By 2025, CBRs operate in 5 communities, weaving almost a million tons of feedstocks into energy equivalent to 100,000 barrels of oil. This scalability, backed by USDA models, reflects Newton's creed in action.

A Visionary Shaped by Science and Spirit

Hewitt's leadership, like Newton's, blends science and spirit. His Food Science expertise optimizes processes—90% yields in bioreactors fermentation—ensuring every molecule's energy is preserved. His commitment to zero waste weaves agricultural abundance into both food and fuels, removing the debate on feeding the planet or fueling the planet.

Alcohol, biomass, and Hydrogen fuel cells for electricity, proving that every residue is a brushstroke in a sustainable future.



The First Law: The Molecular Canvas

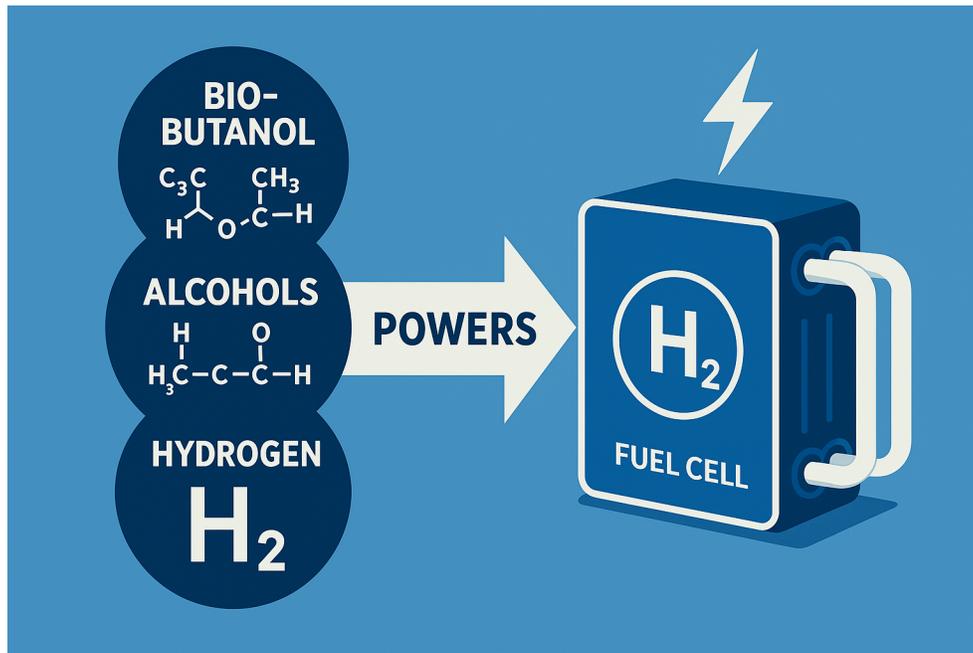
Newton's quote is CBR's cosmic loom, embodied in the first law ($\Delta U = Q - W$). In corn and hemp stalks, cellulose C-H bonds (413 kJ/mol) cradle 4,500 MJ/ton. Micronize it, and the bonds remain intact, ready to be rewoven into bio-butanol (28 MJ/kg) or protein isolates. The first law ensures every joule persists, reshaped as Newton foretold.

Threads of Eternity: Covalent Bonds

Covalent bonds are CBR's artistic threads:

- **Cellulose:** C-H bonds (413 kJ/mol) store 14 MJ/kg in corn.
- **Lipids:** C-C bonds (347 kJ/mol) yield 37 MJ/kg in soy.
- **Proteins:** C-N bonds (305 kJ/mol) hold 17 MJ/kg in hemp.
- **Lignin:** C-C bonds in rice husks store 4,200 MJ/ton.

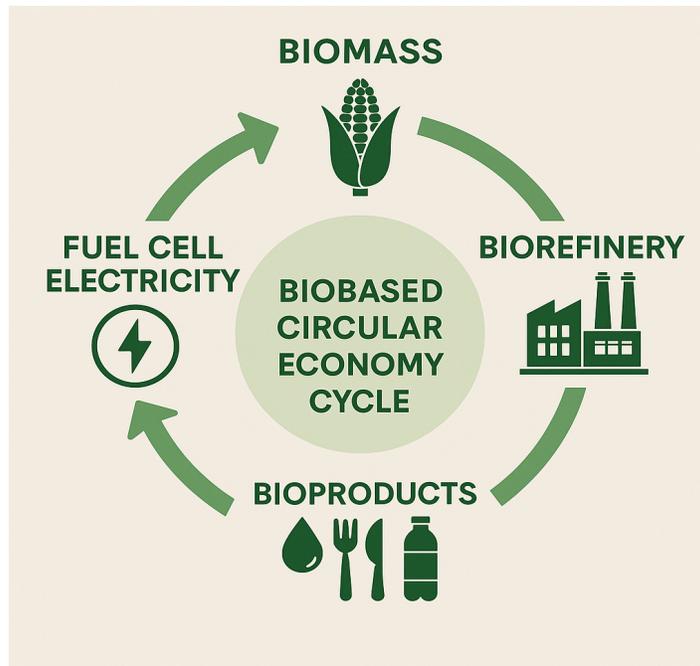
These bonds, formed by quantum electron sharing, are energy reservoirs. Micronization preserves them, while separation isolates 90% pure proteins, high-oleic oils, fibers, and sugars. Fermentation weaves sugars into bio-butanol, alcohols and hydrogen powers fuel cells, and fibers form bioplastics, fulfilling Newton's vision.



Thermodynamics Unraveled: Energy and Entropy's Fray

Thermodynamics is CBR's poetry, governed by four laws. The first law, Newton's creed, ensures energy's eternity. The second law introduces entropy, where some energy frays as heat. In fermentation, 60% of glucose's C-O bonds (4,500 MJ/ton) become bio-butanol (2,700 MJ); 900 MJ scatters. CBRs counter with hydrogen fuel cells (800 MJ) and bioplastic fibers, reducing entropy.

Taming Entropy with Art



Feedstock variability—corn (4,500 MJ/ton) versus hemp (4,200 MJ/ton)—challenges efficiency. CBRs adapt: for isolates, **lignin-rich hemp** for gasification. Sensors optimize bond-breaking, achieving **75% energy recovery** (2024 study). In Brazil, a **biochar sculpture** inspires sorting, boosting efficiency by 50%. This artistic response, echoing Newton, weaves order from chaos.

Community BioRefineries: From Abundance to Treasure

CBRs and HBRs are **sanctuaries of alchemy**, transforming feedstocks into **bio-butanol, protein isolates, oils, bioplastics, and electricity**. Operating locally, they cut transport costs by **70%** and foster resilience. Hewitt's vision, like Newton's, makes CBRs **artistic hubs**, unlocking treasure.

Core Processes: Weaving Molecular Threads

CBR's zero-waste processes, validated by USDA, are:

- **Micronization:** Cold water breaks feedstocks into micron-sized particles, preserving bonds. A ton (4,000 MJ) retains all energy.
- **Component Separation:** Isolates **90% pure proteins, oils, fibers, and sugars**. Corn yields 800 MJ of protein, hemp 900 MJ of oils.
- **Fermentation:** Sugars weave **bio-butanol (2,400 MJ/ton), PLA/PHA, and hydrogen** through microbe-inoculated fillers.
- **Bioplastics Production:** Fibers and PLA/PHA form **biodegradable plastics or fish feed (900 MJ/ton)**.
- **Hydrogen Capture:** Hydrogen (1 MJ/kg) powers **fuel cells**, generating excess electricity.
- **Gasification:** Lignin yields **syngas (3,150 MJ/ton)** for turbines.

HBR specializes in industrial hemp, producing **protein isolates, oils, and bioplastics**, aligning with CBR's circular economy. Learn about HBR (www.hempbiorefinery.com).

Innovations: Mastering Molecular Looms

CBR's nine innovations are **artistic looms**, maximizing molecular energy:

- **Micronization:** Preserves **100% bond energy**, validated by USDA.
- **Bio-Butanol Fermentation:** Yields **2,400 MJ/ton**, outpacing ethanol (2025 US trial: **10% boost**).
- **High-Efficiency Digesters:** Achieve **75% biogas yields** (Brazilian pilot: **2,700 MJ/ton**).
- **Microbial Fuel Cells:** Weave electrons into electricity (**400 kJ/kg**, UK trial: **10% higher recovery**).
- **Machine Learning:** Boosts yields by **12%** (Iowa: **8% bio-butanol increase**).
- **Hydrothermal Liquefaction:** Yields **bio-oils (3,000 MJ/ton)**, Japan: **20% energy cut**).
- **Synthetic Biology:** Produces **bio-butanol (3,200 MJ/ton)**, US: **80% yields**).
- **Quantum Sensors:** Boost efficiency by **15%** (Dutch pilot: **2,800 MJ/ton**).
- **Plasma Gasification:** Yields **syngas (3,800 MJ/ton)**, Germany: **85% efficiency**).

These innovations, inspired by Newton and Hewitt, weave **molecular art** into treasure.

Weaving Social Bonds

In Vietnam, **hemp bioplastic sculptures** unite farmers. In Kenya, **hydrogen-powered festivals** depict molecular art, strengthening ties. These initiatives, rooted in Newton's vision, transform communities into **artistic collectives**, where energy and creativity reshape hope.

[Insert Image: Vietnam hemp sculpture; Alt-text: Hemp bioplastic sculpture]

The Future: A Global Molecular Tapestry

CBRs aim to weave **globally**, transforming significant feedstock volumes. By 2030, **carbon capture** could make CBRs carbon-negative, and **AI-driven biorefineries** could boost yields by **20%**. **Synthetic biology** might achieve **90% energy recovery** by 2035, and **space biorefineries** could weave asteroid biomass, extending Newton's creed. A **2025 open-source platform** and policies like **China's bioenergy mandate** will drive adoption.

Artistic Horizons

Future CBRs may weave **bioengineered dyes** for art and use **augmented reality** to visualize molecular transformations, inspiring communities to paint with energy's threads. These dreams, rooted in Newton's quote, envision a **global tapestry** of sustainability and creativity.

Join the Biobased Revolution!

The quest to transform agricultural abundance is a **lyrical tapestry**, woven by Newton's creed and Hewitt's "Use Everything - Waste Nothing." CBRs and HBRs transmute every molecule into **sustainable treasure**, proving thermodynamics is a **canvas for human ascension**. From **micronized corn** to **hemp bioplastics**, the cosmic loom spins a future where every community crafts hope.

Ready to weave your own thread? Explore CBR's mission (www.communitybiorefinery.com) or contact us (www.communitybiorefinery.com/contact) to join the biobased revolution!

Meta-Description: Discover how Community BioRefineries weave molecular energy into biofuels, proteins, and bioplastics, guided by Newton's thermodynamics and Scott Hewitt's zero-waste vision. Unlock a sustainable future!

For more in-depth information please see our website. [Community BioRefineries](http://www.communitybiorefinery.com)