

# ENERGY BUSINESS REVIEW

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ALTERNATIVE  
FUEL  
E D I T I O N

TRANSFORMING  
BIOMASS INTO  
PRICELESS  
ASSETS

DR. JAGANNADH SATYAVOLU,  
FOUNDER AND CEO



**BioProducts**  
LLC



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ALTERNATIVE  
FUEL  
EDITION



**TOP  
ALTERNATIVE  
FUEL  
SOLUTIONS  
PROVIDER  
2024**

**BioProducts, LLC.**

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**ENERGY  
BUSINESS  
REVIEW**



## BioProducts, LLC.



**TOP 10  
ALTERNATIVE  
FUEL  
SOLUTIONS  
PROVIDERS  
2024**

*The annual listing of 10 companies that are at the forefront of providing  
Alternative Fuel solutions and impacting the marketplace*



COVER STORY



**BioProducts**  
—LLC

## TRANSFORMING BIOMASS INTO PRICELESS ASSETS

By Jade McDonald

**C**limate change is undoubtedly the most significant concern humanity faces today, and it is our responsibility to take the edge off the carbon footprint stamping down on the environment. An alternative fuel promises a viable and sustainable solution for rectifying this man-made damage to the Earth—a much-needed action to save its resources for the upcoming generations.

A prominent agricultural technology company, BioProducts, LLC is at the forefront of navigating this indispensable shift from conventional to alternative fuel. It specializes in developing alternative fuels and other value-added products from sustainable biomass, advocating environmental integrity and sustainability beyond borders.

“In the expanse of our forest and agricultural lands, colossal amounts of residues are left behind; branches, corn stover, sugarcane bagasse, and stillage from distilleries hold immense potential as renewable energy sources. However, they often remain underutilized due to the lack of means to collect, transport and process them, leading to environmental degradation or even forest fire,” says Dr. Jagannadh Satyavolu, founder and CEO, BioProducts.

BioProducts is an innovator in the niche, ideally positioned to tap into this hidden treasure and work toward a common goal—transforming biomass into useful products. The company

holds a range of patents, licensed from the University of Louisville, designed to transform the discarded biomass in forests and agricultural fields into value-added products. Its patented technologies, coupled with other cutting-edge technologies, allow for processing biomass in environmentally conscious and economically advantageous manners.

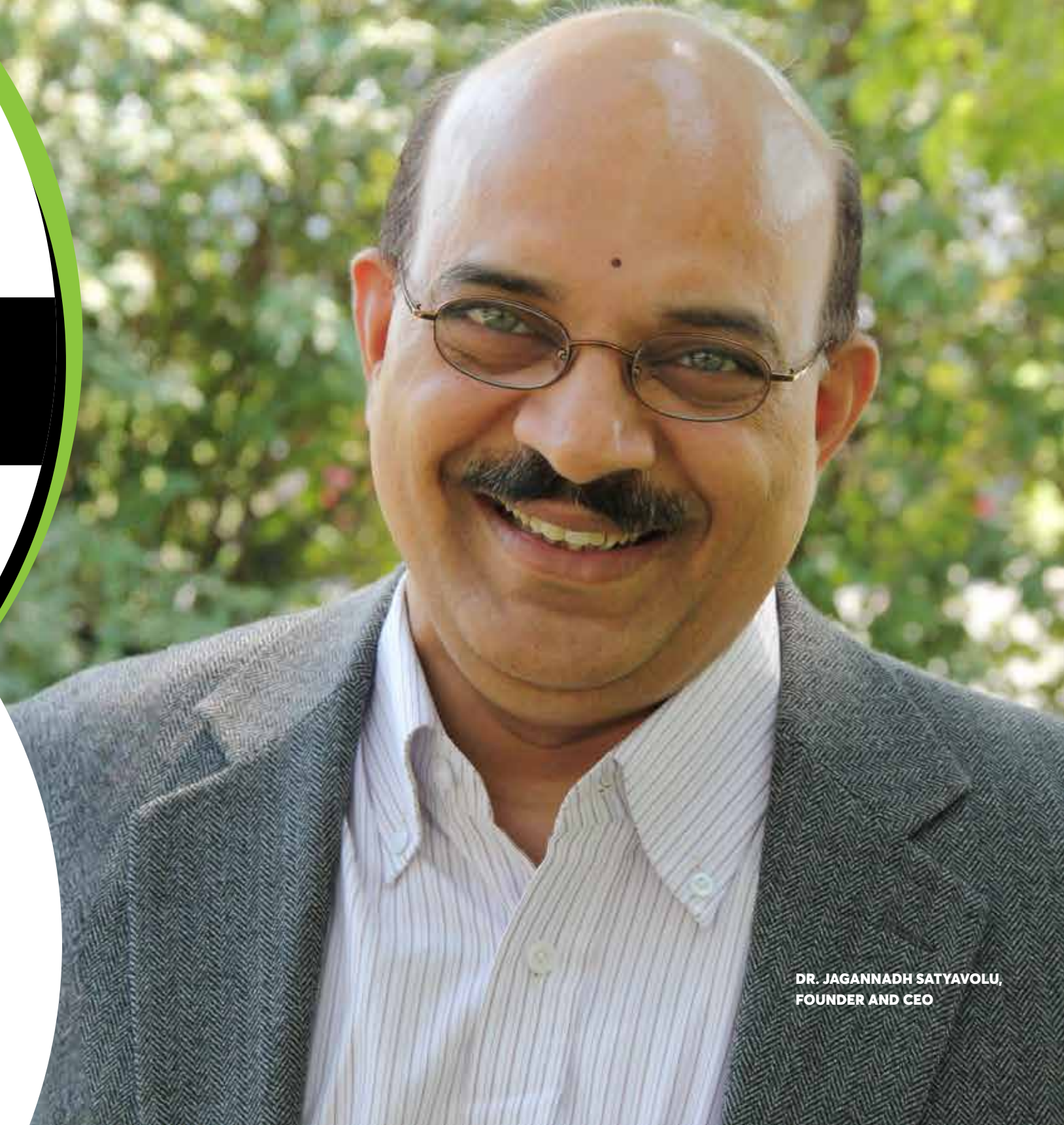


**WE HAVE A BETTER WAY TO  
DO IT; OUR TECHNOLOGY AND  
PRODUCTS ARE DEVELOPED  
TO PROVIDE BENEFITS TO OUR  
ENVIRONMENT RATHER THAN  
POLLUTING AND HARMING IT**

The technology behind the process, xylose extraction and isolation, is born from University of Louisville research—led by Satyavolu, who also serves as theme leader for biomass and biofuels research at UofL Conn Center. His excellence in energy and value creation from waste products and expertise in accelerating the commercialization of bioproducts are central

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TOP 10  
**ALTERNATIVE FUEL**  
SOLUTIONS PROVIDERS - 2024



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to BioProducts. The xylose technology, when integrated with carbonization of biomass (torrefaction), is a radical solution to eliminate or reduce the environmental toll created by burning traditional coal.

“We have a better way to do it; our technology and products are developed to provide benefits to our environment rather than polluting and harming it,” says Satyavolu.

**Delivering a Better Alternative, Safeguarding the Environment**

BioProducts delivers a range of products, including XuCrose, HemiFuel, HemiCarbon, biogas and natural fiber composites. XuCrose is a low-calorie natural sugar (xylose), used as a diabetic sweetener in food and beverages. Extracted from distiller grains, barks, corn stover, wood chips, bagasse, and hulls, this diabetic-friendly sugar substitute, or Xylose, is also best suited for adeptly diagnosing malabsorption in gastrointestinal tract.

After xylose is recovered from corn stover, the remaining biomass converted into fertilizer, helping reduce the greenhouse gas emissions associated with abandoned biomass. BioProducts’ expertise also includes converting stillage into premium animal feed and replacing conventional disposal methods prone to contamination due to remaining liquid fraction. The company’s game-changing technologies fractionate fiber, protein, and water in stillage, yielding value-added products ideal for a diverse range of applications. The

fiber is used to make Xylose sweeteners and activated carbons, while the protein enriches animal feed formulations. Water is treated to produce biogas, generating economic benefits and facilitating decarbonization efforts. This distinctive approach empowers distilleries to benefit from their stillage, averting its burdensome disposal and aligning with the global sustainable development goals.

“Our mission is to create opportunities for farmers and the state to generate additional income through better usage of underutilized residual biomass or wastes,” says Satyavolu.

The excellence of BioProducts’ efforts was demonstrated at a prestigious bourbon sustainability pitch competition in Kentucky. Numerous innovators from across the U.S. gathered for the contest, proposing innovative ways to sustainably use stillage produced by Kentucky’s bourbon industry. Managing one billion gallons of stillage presented a formidable challenge, prompting the Kentucky Economic Development to look for an eco-friendly, space-efficient, and adaptable solution. BioProducts emerged triumphant in this endeavor, solidifying its position as a pioneer in addressing stillage management challenges with sustainable and forward-thinking solutions.

**A Step Ahead of the Industry Standards**

Beyond addressing agricultural decarbonization, BioProducts’ time-tested technology is optimal for producing better alternatives that contribute to environmental sustainability. The company specializes in turning biomass in to a carbon

fuel—a value-added energy material ideal for use in boilers as an alternative to traditional coal. Its innovation has also proven beneficial for the soybean processing industry, allowing them to convert soy hull into carbon-based products and replace the conventional activated carbon.



BioProducts’ product lineup also entails a solid carbon fuel—HemiFuel. This ‘BioCoal’ serves as a sustainable alternative to coal in thermal and metallurgical applications, helping reduce carbon emissions on a large scale. This residual biomass transformed into low-carbon negative solid fuel is characterized by low volatile and high BTU content, driving efficient, eco-friendly combustion, stable performance, and potential cost savings across various applications. The HemiCarbon, on the other hand, is a high surface area activated carbon used in the production of batteries.

The company also offers modular, micro-grid energy solutions to various small communities. Its energy projects focus on curtailing greenhouse gas emissions, taking the communities closer to its promise—a greener and cleaner future.

**Creating New Avenues for Revenue**

Commitment toward communities is a key aspect of BioProducts’ business ethos. Central to this is the strategic placement of modular plants proximate to biomass sources, alleviating logistical challenges and creating employment opportunities within rural and forest communities. They can gather biomass residues, generate new revenue streams, and thereby elevate the quality of life. By efficiently removing this potential fuel, BioProducts mitigates the risks of forest fire, ensuring effective management of forest land and preservation

of natural resources. These distinctive approaches simplify biomass conversions, while its multi-product strategy enables seamless utilization of each ton of biomass, completely eliminating waste.

“Innovation is not just a one-time process at BioProducts; our team consistently develops state-of-the-art technologies and purpose-built solutions to make our Earth cleaner,” says Satyavolu.

Staying true to this promise, BioProducts has introduced a better and more cost-effective fuel for the aviation sector. The integration of Xylose as a clean carbon source holds the potential to make aviation fuel more economically viable, addressing the primary challenge of increased flight costs. The success of this project is rooted in BioProducts’ strategic partnerships with like-minded technology providers who share the same passion for environmental sustainability. The innovation journey continues at BioProducts, and the team focuses on developing economically viable and low-energy solutions. Its key focus is on delivering technologies with minimal energy consumption and quick paybacks within two to three years.



**OUR MISSION IS TO CREATE OPPORTUNITIES FOR FARMERS AND THE STATE TO GENERATE ADDITIONAL INCOME THROUGH BETTER USAGE OF UNDERUTILIZED RESIDUAL BIOMASS OR WASTES**

Thanks to its wealth of commercialization experience spanning academia and major industries, BioProducts, working with its partners, C&I Engineering ([www.cieng.com](http://www.cieng.com)) and Action Industries ([www.actionindinc.com](http://www.actionindinc.com)), is actively engaged in a broad array of projects, indicating significant progress. For example, the company is partnering with leading ethanol producers to develop a powerful suite retrofit solutions and other products, intending to diversify communities’ revenue streams and elevating environmental sustainability. It also focuses on commercializing the technologies and aims to operationalize its demonstration plant by the end of 2024.

With the environmental toll weighing heavy on Earth, BioProducts’ contributions to transform biomass into lucrative opportunities serve as a symbol of hope for the upcoming generations. Partnering with this reliable green-tech innovator, business world can come together to protect our planet, presenting a sustainable Earth to our successors. **EB**