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BIOFORMING
news



VIRENT IS REPLACING CRUDE OIL, CREATING FUELS AND CHEMICALS FROM NATURALLY OCCURRING, 100% RENEWABLE RESOURCES.

VIRENT'S PROGRESS TOWARDS COMMERCIALIZATION

Virent continues to gain momentum to develop and build our first commercial scale plant for the production of bio-based aromatic chemicals, including para-xylene. The purpose of the plant is to establish the market for bio-based chemicals with key customers who desire to be the first to offer bio-based products to consumers. The plant will also demonstrate the successful scaling and operation of Virent's technology.

The Virent team, with the full support of our Board and partners, has undertaken a number of efforts to advance the plant build. Virent has hired an engineering firm to progress plant design and identified a site host for the facility. Virent is also exploring multiple financing options for the plant construction and operation, including both private and public funding sources. As part of this ongoing process, the economics of our technology have been externally vetted to confirm capability to deliver cost competitive products.

In parallel with those efforts on the commercial plant, Virent also has completed asset upgrades in our current Madison facility to support product development and process validation activities by our customers. Virent has operated its Eagle demonstration system to fulfill a number of

customer orders since it started operation in 2010. With the recent added capability, Virent is capable of delivering purified para-xylene and other products needed for customer validation and demonstrations necessary for building interest in product offtake from the commercial plant. Product offtake agreements are vital in building the commercial case for the plant as part of our ongoing financing activities.



LEE EDWARDS,
CEO

I am encouraged by the efforts of our team to advance our commercial plant plans. Much work remains, but I am confident that we have the right resources, relationships and capabilities to move this effort to a successful conclusion.

This issue also highlights other milestones for fuels activity, along with the recent addition of experienced talent to support continued progress.

Thank you again for your continued support.

MEET EMPLOYEE PAUL MYREN

Paul joined Virent in 2010 as an Associate Process Development Engineer and was promoted in 2012 to Process Development Engineer. Paul works in Virent's biomass deconstruction research group and is the technical lead for one of our government projects that researches the conversion of biomass to liquid fuels and chemicals. An avid outdoorsman, Paul loves fishing, hunting and boating. The highlight of Paul's summer was recently getting married. He and his new wife, Alyssa, plan to go on their honeymoon somewhere warm sometime this winter. Paul grew up in Alexandria, Minnesota and received a B.S. in Chemical Engineering from the University of North Dakota.



MEET EDGAR STEENWINKEL, VIRENT'S NEW VP OF R&D

Virent is pleased to welcome Edgar Steenwinkel to our team as VP of R&D. Edgar will lead technology advancement efforts of Virent's BioForming® platform in preparation for the commercialization of our biofuel and biobased chemicals.

Edgar's background is in developing, scale-up, and production of heterogeneous catalysts. He has worked with alumina, hydrothalcites, clays, and especially zeolites; designing catalyst supports by influencing porosity and other characteristics. In the mid 2000's, Albemarle started a new initiative, to leverage the heterogeneous catalytic knowledge into the budding and exciting world of renewable fuels and chemicals. Edgar and his newly formed team designed several catalysts for renewable diesel, renewable chemicals, pyrolysis oil upgrading, and (bio) syngas conversion.



Edgar's recent assignment at Albemarle was in Baton Rouge, Louisiana with their polyolefin catalyst division. Edgar was responsible for the development and commercialization of catalysts for polyethylene and polypropylene. These processes are as much about the physical limits of the materials as about the kinetics of the reaction. Taking both aspects into consideration helps design better catalysts.

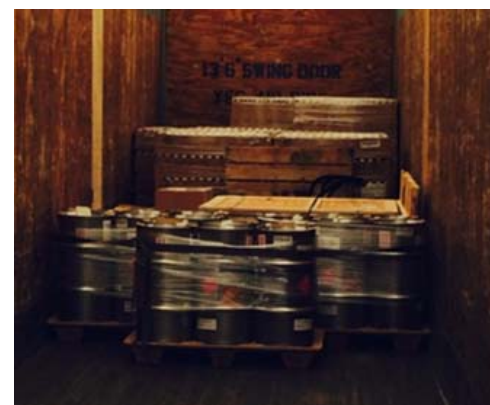
"I hope to incorporate some of these experiences in future iterations of the catalysts that Virent is developing," Edgar said. "It is going to be an extremely exciting time in the next weeks and months as we gear up to deploy the technologies to commercial scale. I can't wait."

Edgar has his Masters in Chemical Engineering from the University of Amsterdam and his Bachelors in Chemical Engineering from The Hague University.

VIRENT OPERATES ITS DEMONSTRATION PLANT FOR LONGEST RUN TO DATE

We have been very busy the past five months preparing and re-starting our product demonstration plant (Eagle). The run began on June 2nd and is producing biogasoline for a customer off-take order. So far we have shipped thirty-six 60 liter drums and will ship an additional 5,000 liters before the end of the year for a total shipment order of 7,570 liters (or approximately 2,000 gallons).

Operating Eagle has truly been a cross functional team effort resulting in a very successful run. To date this is the single longest run and largest volume of fuel produced in that plant. When we complete this run, it will exceed the previous six campaigns combined. It has been a very smooth run which is excellent validation of the Eagle system and our capability to produce product at larger scale. We will be adding functionality this Fall for the manufacture of test quantities of a chemical used for plastics production to advance our commercial relationships for a larger commercial plant.



VIRENT RECEIVES EPA REGISTRATION

Earlier this month we announced that we successfully received fuel registration* from the U.S. Environmental Protection Agency (EPA) for our BioForm® Gasoline in blends of up to 45%. As a registered fuel, our biogasoline can now be used in on-highway motor vehicles. Virent's BioForm® Gasoline blended with conventional gasoline underwent testing at Southwest Research Institute (SWRI) with the results demonstrating that the emissions from the blended fuel were well below the maximum permitted by current regulations. The EPA testing work was funded by Virent partner Royal Dutch Shell.

"Shell is pleased to see continued progress of biofuels as a road transport fuel in the United States as evidenced by this most recent EPA registration of a plant-based alternative fuel. This success demonstrates the progress being made by the biofuels industry. Also, it supports a continuation of a framework for expanding commercialization and use of biofuels, including advanced biofuels produced from non-food based plant alternatives, in the United States," said Matthew Tipper, Shell Vice President Alternative Energies.

*EPA registration does not constitute endorsement, certification, or approval by any agency of the United States.

VIRENT HIRES TOM STEPHEN

Tom Stephan joined the Virent team earlier this summer as Principle Process Engineer. Tom will be responsible for leading project management and project engineering activities for the Small Commercial Plant that we are developing for the production of bioparaxylene and co-products from ethanol.

Tom is a chemical engineer with broad capabilities that include process technology development, capital projects, and facility operations. Tom has had significant involvement in taking new process technology developments from concept to commercialization, improving existing operations and leading multi-functional teams. Tom has worked at Superior Engineering, Flint Hills Resources, BP, Amoco and Exxon among other companies. He holds a B.S in Chemical Engineering from Purdue University.



VIRENT HIRES RALPH LERNER

Ralph Lerner joined the Virent team earlier this summer as Director of Business Development and will initially focus on our fuels activities. Ralph has 30+ years of experience within the biofuels, petrochemicals and energy industries and a demonstrated track record in developing new business ventures and commercial relationships, developing and implementing business strategies, and leading project development teams.

Ralph's international experience includes six years working in China and Asia in business development, joint venture management, and planning and strategy roles in various chemical product lines. Companies Ralph worked for prior to joining Virent include Edeniq, BP plc and Amoco Corporation. Ralph received an MBA in Finance from the University of Chicago, MS in Chemical Engineering from Stanford, and BS in Chemistry from the University of Illinois.



VIRENT ON THE ROAD

September 18-20, 2014

Platts Aromatics Asia

Seoul, South Korea

October 28-29, 2014

World Bio Markets USA

San Diego, CA

Virent presents around the world at a wide variety of events, and our annual calendar is kept up-to-date on the [events area of our website](#).