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# BIOFORMING news



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

## NEW TECHNOLOGY SCALE-UP RISKS

Recent coverage of technology scale-up challenges of some of our competitors highlights the risks associated with first of a kind commercialization projects. Companies like Amyris and Gevo have failed to meet first-plant commercialization milestones, resulting in significant loss of market value. However, these are examples of fermentation conversion processes for chemicals and fuels. Virent's catalytic technology is different. Our scale-up risks are similar to those experienced over decades in the refining and petrochemical industry.

Because our conversion technology is based on continuous catalytic chemistry, Virent's scale-up risks are familiar to engineers with experience in refining and chemicals manufacturing. In support of our commercialization efforts, Virent hosted five experts in catalysis, refining and chemicals technology as part of a Technical Peer Assist workshop. The participating experts provided Virent the benefit of more than 150 years of combined experience from Exxon, Amoco,

Abermarle and BP in addressing risks, mitigations and prioritization. These experts first examined Virent's technology in mid-October and will continue to periodically visit Virent until a thorough understanding of our technology, its strengths and areas to improve upon, is reached.

The purpose of the Technical Peer Assist is to review our progress and provide independent input on priorities to further reduce Virent's scale-up risks. The output from the workshop will advise us on what our key priorities are going into 2013 and beyond, reducing uncertainty in our scale-up efforts for chemicals and fuels. So far, key insights have been provided on fundamental analysis of data, reactor design, and data driven stage-gate decision discipline, all important components of successful commercialization development. Stated Lee Edwards, "I was particularly satisfied with the open discussion and relevant 'lessons learned' the group brought to Virent."



LEE EDWARDS, CEO

## MEET EMPLOYEE DICK OLSON

Virent's Senior Machining Specialist, Dick is responsible for designing and assembling structural components, pressure vessels, reactors and any other metal pieces needed in the labs. One of Virent's longest tenured employees, Dick began working for Virent in 2003, and he especially enjoys the freedom he has to take some creative license with the parts fabricated in the shop. He explains, "It's a rewarding situation to fabricate a piece of equipment where the design parameters are not fully known and have it work the first time out of the box." The on site fabrication expertise he provides has largely contributed to Virent's proven ability to move from one project to the next at a rapid pace, an attribute essential to the success of an R&D company. Among Dick's proudest accomplishments at Virent are the jet fuel producing mini distillate pilot plant, the hydrogen and electricity producing Green Energy Machine from the collaboration with MG&E, and the early hydrogen reactors he designed which established Virent's strong presence in the R&D space. Dick enjoys motorcycling on the weekends, and he and his wife welcomed their first grandchild, Matthew, this year.



## WELCOME JULIE SINISTORE, SR. LIFE CYCLE ANALYST

Virent is pleased to announce the addition of Julie Sinistore, Senior Life Cycle Analyst, to our team. Julie's primary role is to develop life cycle assessments for Virent's processes for fuels and chemicals through all stages of development to commercialization.

Julie received a BS in Natural Resource Management from Cook College of Rutgers University, and an MS in Agroecology, and recently a Ph.D. in Biological Systems Engineering from the University of Wisconsin – Madison, where she focused on the life cycle assessment of cellulosic ethanol production from corn stover and switchgrass. Additionally, as part of her Master degree, she focused on the life cycle assessment of Wisconsin corn grain ethanol production, identifying ethanol production systems that reduce net Greenhouse Gas emissions and improve the overall energy efficiency.

Julie grew up in New York and New Jersey, but has lived in Madison for the last five years. She is training for a black belt in karate at East Madison Karate where she is also an assistant karate instructor.



## VIRENT FEATURED IN WEDC'S CAMPAIGN

The Wisconsin Economic Development Corporation launched a new marketing initiative titled "In Wisconsin" to promote the benefits of starting, expanding or locating a business in Wisconsin. The campaign highlights five unique companies in Wisconsin including Virent. Other companies include Trek Bicycle, Schneider National, Rockwell Automation and Organic Valley.

An advertisement exclusively made for Virent has been created (see below), and will be posted in the Wisconsin State Journal and on billboards in Wisconsin and bordering states. Along with the ad, a short video featuring Virent and our relationship with the State can be viewed in the coming weeks at [discovered.inwisconsin.com](http://discovered.inwisconsin.com). Virent is delighted to be one of the companies chosen for this campaign and appreciative of the opportunity to continue to share our story and capabilities.

To read more about the campaign, [click here](#).



## BI-ANNUAL BIC MEETING HOSTED AT VIRENT

The Biobased Industry Center (BIC) held its bi-annual meeting at Virent, the first time off campus. Hosted by Iowa State University, the BIC is composed of companies in the energy, agribusiness, and automotive industry, as well as first and second generation biofuel companies such as Virent, who has been a member since Fall 2010.



Topics of the meeting included modeling and trade dynamics of world sugar markets, energy markets, and biofuels, along with discussions on long term sustainability using geospatial modeling tools and optimal crop land rotational strategies. After the meeting concluded, Bruce Babcock, Cargill Endowed Chair in Energy Economics and BIC Director, gave an intriguing presentation to the Virent Board of Directors, executives, and other employees titled "Future for Biofuels under the Renewable Fuels Standard." To read more about the BIC, [click here](#).

## VIRENT PARTICIPATES IN DAYS OF CARING

As part of United Way's Days of Caring annual campaign, Virent employees volunteered for an afternoon to cut and pull buckthorn at the UW – Madison Lakeshore Nature Preserve.

An invasive shrub, buckthorn destroys wildlife habitat and prevents the growth of native vegetation. The nature preserve staff were very appreciative of the work that was done, saying that it will "really transform the area for years to come."



Top row left to right: Kiley Djupstrom, Caitlin Johnson, Dan Komula, Josh Yach, Greg Brock, Derek Novy, Megan Weber, Josh Webb, Bernie Grosso.  
Bottom row left to right: Stacy Isferding, Mary Tilton, Kristin Campbell, Amanda Peterson, Lee Edwards.

## VIRENT WELCOMES KRUG FENZ TO BOARD

Virent announced that R. Krug Fenz, Senior Manager, M&A and Commercial Finance, Americas, for Shell Oil, has joined its Board of Directors. Mr. Fenz will also serve as a member of the Audit Committee.



Prior to joining Shell in 1996, Mr. Fenz worked at both international consulting firms and Fortune 500 companies, including ROSS Corporation, Ecolab, Lone Star Technologies, Pennzoil, Diamond Shamrock and Gulf Oil. With 30 years of management experience, he has spearheaded corporate growth and diversification through mergers, acquisitions and joint ventures, commercial product introduction, financing of new business ventures and strategic planning. He has also developed, launched and managed North American and Southern Hemisphere new venture start up and product expansion programs.

"Virent offers an intriguing and differentiated solution for biobased fuels and chemicals," Fenz said. "I am pleased to join Virent's Board and contribute to the long-term success of this promising company."

Fenz earned a BS in Economics and a BA in International Relations with honors from the University of California. He went on to receive an MS in International Relations from Georgetown University with additional post graduate studies in economics and law.

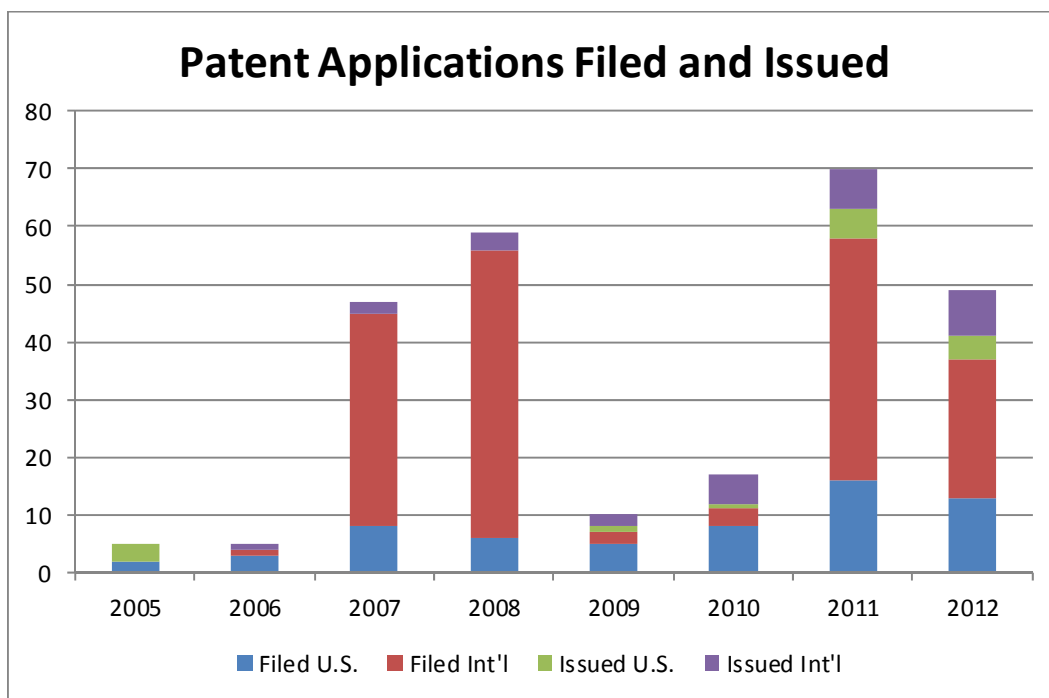
## UNITED WAY CHILI COOK-OFF FUNDRAISER

Virent held its 5<sup>th</sup> annual Chili Cook Off to kick off fundraising to support the United Way of Dane County, a nonprofit organization focused on strengthening our community. Employees purchased a bowl for \$5 and then voted for their favorites by putting cash or tickets into each chili's jar. Congratulations to Lee Edwards, CEO, for generating the most votes in money (in an anonymous entry). From the chili cook off alone, Virent raised \$451. However, we didn't stop there. Virent also held its annual United Way Pledge Drive and silent auction to raise even more money. We received donated items from employees, vendors, local businesses, the Green Bay Packers and the Wisconsin Badgers for the silent auction. From the cook off, pledge drive and silent auction, Virent proudly surpassed its fundraising goal of \$14000, raising \$14100.

## VIRENT INTELLECTUAL PROPERTY UPDATE

We are proud to announce that 21 new patents have been issued or allowed at Virent so far in 2012. Five of these patents have been issued in the U.S., one of which is directed to liquid fuel compositions containing aromatics derived from carbohydrates. This patent is believed to be one of the first patents to cover biogasolines. The 16 international patents include catalysts for reforming oxygenated hydrocarbons, methods for generating functional intermediates and liquid products, and reactor systems used in accordance with Virent's BioForming® process.

The newly issued patents and allowed applications make up a portion of Virent's portfolio that includes over 200 domestic and international issued and pending applications covering 28 technology families. Virent continues to file new patent applications domestically and abroad, with 34 new applications filed in 2012 to date. In addition to the recently filed applications, Virent is currently drafting applications covering new technology families. Below is a table that illustrates the growth of Virent's intellectual property portfolio since 2005.



## VIRENT ON THE ROAD

November 13-15	4th International Conference on Bio-fuels Standards: Current Issues, Future Trends	Gaithersburg, Maryland
November 29-December 1	Bioenergy Futures: Technical Feasibility Meets Social Sustainability	East Lansing, Michigan
December 11-13	Sustain Dane: Badger Bioneers	UW Madison Campus
January 28-31	4th Annual Next Generation Bio-Based Chemicals	San Diego, California

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](#).