## PRIMARY CONTACT PERSON

Provide contact information for the primary point person

for the contest entry.

 **First Name: William**

 **Last Name: Etzkorn**

 **Title: Sr. Chemical Engineer**

 **Email: bill.etzkorn@matricresearch.com**

 **Phone: (800) 611-2296 x 936**

## COMPANY or institution INFORMATION

Provide contact information for your business (if you have formed a company. A company not having yet been formed will not be a detriment to your application.)

**1. If your submission is a New Product or Service:**

 **Company: Aither Chemicals, LLC**

**1740 Union Carbide Drive
South Charleston, WV 25303**

 **Website: www.Aitherchem.com**

 **Phone (main): (800) 611-2296 x-945**

 **Number of employees: 10**

 **Incorporation type: LLC**

 **Year founded: 2010**

 **Industry sector: Chemical Manufacturing**

**OR**

**2. If your submission is an academic research project:**

 **Research Institution:**

 **Department:**

**ADDRESS**

 **Address1: Aither Chemicals, LLC**

 **Address2: 1740 Union Carbide Drive**

 **City: South Charleston**

 **County: Kanawha County**

 **State: West Virginia**

 **Zip: 25303**

## TEAM

Provide the names and titles or areas of focus of your leadership/management/research team.

 **Name: Dr. Len Dolhert**

 **Title or Area of Focus: Chief Executive Officer**

 **Name: Mr. Steve Adelkoff**

 **Title or Area of Focus: Chief Financial Officer**

 **Name: Dr. Parvez Wadia**

 **Title or Area of Focus: Chief Technology Officer**

 **Name: Dr. Madan Bhasin**

 **Title or Area of Focus: Catalysis**

 **Name: Mr. William G. Etzkorn**

 **Title or Area of Focus: Technology Development**

 **Name: Mr. Mark Nunley**

 **Title or Area of Focus: Process Engineering**

 **Name: Mr. Peter Dailey**

 **Title or Area of Focus: Chairman and CEO of RMG; Financial Advisor**

 **Name: Mr. Enzo Zoratto**

 **Title or Area of Focus: Project Development; Financial Advisor**

 **Name: Mr. Fahad Qureshi**

 **Title or Area of Focus: Chief Financial Analyst**

## Technology Development/Commercialization Plan

This is the most important section of the entry form. ***Each field has a maximum length of 800 characters, so be succinct and specific***.

***Before beginning, review the sample entry form and contest application instructions included at the end of this document.***

***DO NOT SUBMIT ANY ITEMS IN HARD COPY.***

***Only applications submitted through this website will be considered.***

***NOTE: All items submitted to this contest***

***will be destroyed after the contest.***

**Market Opportunity:**

The market opportunity is to convert abundant ethane from the Marcellus shale into valuable products in the PA, WV, and OH region. The highest value use for ethane is to convert it to petrochemicals, but there is currently no conversion of ethane creating a local market opportunity. Natural gas wells generate streams high in ethane, yet demand is too low to justify economic removal. Often the only viable option is to burn the natural gas stream for fuel value. Gas pipelines cannot safely transport ethane streams, stranding the ethane at the gas processing source location with limited, or no economical purification, transport, or use options. A process that can address these stranded or excess ethane problems at natural gas wells will provide both economic and environmental advantages.

**Description of your technology/product/service:**

The Aither process can secure ethane value from natural gas by using catalytic conversion to select high-value chemical products with a process that, compared to cracking, can deliver:

* Order of magnitude smaller incremental investment: production can expand as market demand increases.
* Better economics: 25% lower capital cost and lower operating cost
* Substantially reduced energy and waste: less than half the energy requirement and CO2 emissions compared to other processes
* Highly integrated use of heat, energy, raw material, and common processing unit-operations.
* Smaller foot-print, allowing plants to operate within existing plant infrastructure or close to the natural gas well-head.
* Provide only targeted products most needed by existing local chemical-product demand.

**Customers:**

Chemical companies, particularly those that presently rely on transport of strategic materials to meet their current sales and production demand could have Aither provide local supply of their needs. Transportation costs can be eliminated along with safety and liability issues associated with current product shipment (e.g., ethylene oxide).

Chemical plants currently operating at substantially reduced capacity in the PA, WV, and OH region could realize full-utilization of their existing infrastructure capability.

Natural gas suppliers and processors may benefit by reducing their processing steps and increasing ethane sales and/or the value of their gas products when forward integrating with an Aither facility.

**Customer Problem:**

Currently Marcellus gas producers have been burning ethane-rich gas due to the unavailability of cost effective alternatives for utilizing ethane.

Chemical customers have to buy chemicals and ship them long distances from the US Gulf Coast. Some of these shipped chemicals are hazardous and incur high costs of transportation and risk due to liability.

Petrochemical crackers have a high energy and CO2 footprint. CO2 emissions and energy conservation has become a priority and is increasingly becoming regulated nationally and internationally. Cracking and co-products represent 30% of the Chemical Industry Energy usage. The Chemical Industry represents 20% of US energy consumption (DOE).

Aither Technology enables up to 80% reduction in energy and CO2 emissions compared to Cracking.

**Value Proposition:**

Aither creates high-value end-products (ethylene and acetic acid derivatives) that can be safely handled, transported, and stored. The investment cost to install Aither technology is orders of magnitude less than investment in a large regional-area steam cracker. Therefore plants may be constructed and incrementally expanded as the natural gas production is increased, an option not available to cracker facilities. Also, multiple plants can be built to match local ethane supplies, available real estate area, or local market demand.

* Aither has the lowest cost technology to convert ethane to petrochemicals.
* Faster to commercial production than any other technology

**Intellectual Property:**

Aither has filed patent applications during 2010 and 2011. Aither’s intellectual property covers the cost-advantaged Aither process for converting ethane to finished petrochemicals beyond ethylene. Aither’s technology is combination of previously-demonstrated at commercial scale process steps that are combined in a unique way to lower processing costs. Aither staff has unique know-how from having previously developed and demonstrated Aither’s technology

**Competitive Advantage:**

* Aither has the lowest cost technology to convert ethane to petrochemicals
* Aither has a unique intellectual property position which protects its low-cost advantage.

**Team:**

**Leonard Dolhert, CEO**

* ***More than 20 years of technology commercialization experience***
	+ *Founder and CEO of Primet Precision Materials, which has raised $30MM in venture capital*
	+ *16 years experience creating and commercializing new technologies at W.R.Grace, a large chemical company*
	+ *Ph.D Massachusetts Institute of Technology*
	+ *M.B.A. Wharton Business School*

**Steve Adelkofff, Chief Financial Officer**

* **20 years working in all aspects of the power, alternative energy and commodities industries**
	+ *President and Chief Operating Officer of RMG, a not-for-profit organization devoted to bringing clean tech and renewable manufacturing employers to the Western Pennsylvania region.*
	+ *Led teams negotiating domestic and international transactions involving commodities, power generation development, renewable energy development, and commodity exploration*
	+ *Expert in legal, regulatory, tax and accounting aspects of financial transactions*
	+ *Equity partner at K&L Gates, LLP representing independent power producers, utilities, exploration companies, lenders (both senior and mezzanine) and equity participants*
	+ *Completed international and domestic transactions totaling billions of dollars in industries ranging from power generation and timber to commodity exploration and LNG facility development*
	+ *Participated in the development and acquisition of over 400 MW of wind energy representing both developers and lenders*
	+ *Led a team in the complex financing of the AES Andres power plant and liquefied natural gas facility located in the Dominican Republic*
	+ *Serves as an industry source for the media, including the New York Times and CFO Magazine*
	+ *Chartered Alternative Investment Analyst and frequent lecturer on topics as wide-ranging as Shariah compliant investment vehicles and credit tenant leasing*
	+ *Adjunct professor of the MBA program at Seton Hill University, where he teaches Law and Business Ethics*
	+ *Earned Juris Doctorate from the University of Pittsburgh School of Law (where he graduated Magna Cum Laude), his Master of Business Administration degree from Cornell University – The Johnson School of Management, and his Bachelor of Arts degree from Rutgers University.*

**Parvez Wadia, Chief Technology Officer**

* ***More than 35 years of R&D experience (Union Carbide, Dow, and MATRIC)***
	+ *In July of 2004, he joined MATRIC as the Chief Technology Officer and Executive Vice-President with responsibilities in all three market segments:*
		- *Chemical and Environmental Technologies, Advanced Engineering Systems, and Health and Life Sciences.*
	+ *At MATRIC he is accountable for strategic planning, new business development, launching technology-based start-up companies to commercialize new product and processes, research strategy, intellectual property management, customer partnerships and people development.*
* *Game-changing technology development and commercialization*
* *Strategic technology assessments, techno-economic analyses and RD&E strategy development*
* *Risk management and reduction strategies for new technology commercialization*
* *Intellectual property development and management for competitive advantage.*
* *Methodologies for enhancing R&D effectiveness and efficiency*
	+ *Joined Dow Chemical in 2001 following the merger and played a leadership role, serving as Global R&D Director of the EO/EG business.*
	+ *Held positions of increasing responsibility at Union Carbide, including:*
		- *Process Group Leader and Technology Manager for the EO/EG and global technology licensing businesses,*
		- *Associate Director, Director of R&D, and Vice President of R&D.*
		- *Dr. Wadia was accountable for the technology needs of the Industrial Chemical Division (ICD) and the Licensing and Ventures Group, and provided functional leadership for 300 scientists and engineers.*
* ***Provided the vision and program management for the development of Union Carbide’s proprietary METEOR process for EO/EG***
	+ *Reduced capital cost by 40%, and raw material efficiency by 20%, while enhancing reliability and inherent safety*
	+ *This leading technology is being licensed globally, and altered the basis of competition in this industry*
* *Developed a fluid-bed agglomerated ash coal gasification process for synthesis gas production, was lead scientist for the development of UCC’s first integrated oxygen-based process for ethylene oxide and glycol (EO/EG) production, and pioneered the first design of a continuous catalyst manufacturing facility.*
* *Dr. Wadia received the Gold Medal at the Indian Institute of Technology (IIT) where he obtained a B. Tech (Honors) degree. He received a Master’s Degree in Chemical Engineering Practice from the Massachusetts Institute of Technology (MIT) and a Doctorate of Science degree in Chemical Engineering from MIT in 1975, with a minor in Business Administration from the Sloan School of Management. He was a member of the MIT faculty while serving as the Associate Director of the School of Chemical Engineering Practice at the Oak Ridge National Laboratory from 1970 to 1971.*

**George Keller, Engineer**

* ***More than 40 years of R&D experience (Union Carbide, MATRIC)***
	+ *During distinguished career in the Research and Development Department of Union Carbide Corporation, Dr. George Keller rose to highest position on the technical ladder.*
		- *Leader of the Separations and Process Fundamental Skill Center*
	+ *Widely known expert in Chemical separations science and technology*
		- *Co-author of an authoritative book in this area.*
	+ *Chemical process fundamentals*
* ***Commercialization of innovative technology***
	+ *Many distillation and related processes*
	+ *Most advanced technology for producing oxygen via miniature adsorption units in the homes of people with severe lung problems*
	+ *World’s largest pervaporation facility*
* ***Elected to National Academy of Engineering***
* ***Named a fellow of the American Institute of Chemical Engineers***
* ***Served on the National Research Council's Board on Chemical Science and Technology***
* ***Recently announced on AIChE’s list of 100 Chemical Engineers of the Modern Era.***
* *Keller has lectured in more than 30 universities; authored, coauthored, and edited more than 30 publications; and, with colleagues, holds 21 U.S. patents.*
* *Dr. Keller received a BS in* *Chemical Engineering from Virginia Tech and a PhD in Chemical Engineering from Pennsylvania State University.*
* *He is a co-founder of MATRIC and also serves on the Executive Committee of the Board of Directors.*

**Madan Bhasin, Catalyst Scientist**

* ***Expertise in heterogeneous catalysis and surface science, applied and fundamental***
* ***More than 45 years of experience***
	+ *Senior Research Scientist at Dow Chemical and Corporate Fellow at Union Carbide*
	+ *Member, U.S. National Academy of Engineering*
	+ *Recipient of the Dow Chemical Two Highest Awards: H. H. Dow Gold Medal & President’s Award ( a First for R&D )*
	+ *Recipient of “Citation of Recognition“ in Congressional Record of U.S. Senate 1988*
* ***Discovered, developed, led, and assisted in commercialization of eleven generations of improved efficiency ethylene oxide catalysts which have contributed, per year, $30 to $60 million(for 30+ years) income without additional investment. Reduced CO2 emissions by ~70%.***
* ***Developed and applied a variety of surface analytical techniques (Auger, XPS, SIMS, ISS, High Resolution Scanning Auger) for characterization of various commercial and developmental catalysts.***
* ***Vast experience in other “game-changing” catalytic technologies***

**Mark Nunley, Engineer**

* ***Process Engineer / Improvement Engineer***
* ***17 years of manufacturing / improvement experience (Dow and Union Carbide)***
	+ *Chemical process operations support.*
	+ *Process design and implementation of new processes and manufacturing improvements from initial conception to commercial production.*
	+ *Project management and implementation of operations capacity, reliability, automation, safety, and environmental improvement projects,*
	+ *Economic modeling, evaluation, and authorization.*
	+ *Troubleshooting and incident investigation.*
	+ *Process safety and reliability.*

**Bill Etzkorn, Engineer**

* ***Extensive experience in process development, scale-up, and commercialization***
* ***30 years of industrial R&D experience (Dow and Union Carbide)***
	+ *strategic development and implementation of technology for specialty chemicals businesses*
	+ *Pilot plant design, construction, and operations management for process development*
* Developed New Commercial-Process Technology for
	+ *Acrylic Acid. Capital cost reduced by 30%, manufacturing cost reduced by 15%*
	+ *Methyl mercaptopropanal. Reduced capital cost by 15% and improved efficiency by 25%.*
	+ *Acrolein. Reduced capital cost of a new world scale facility by 40% and operating costs by 35%.*
* Conceived and implemented new product development pipeline for Acrolein Business and Specialty Monomers Businesses.
	+ *Developed twelve new products and completed business screen to ascertain new product impact on industry. Three products were commercialized for industry use.*
* Developed improved acrolein chemical manufacturing process and catalyst technology.
	+ *Increased profits by 800% over 8 years while maintaining constant operating cost.*

**Peter Dailey, Chairman and CEO of RMG; Financial Advisor**

* **20 years of power and energy industry experience in the trading, risk management, generation, and transmission and distribution business.**
	+ *Chairman and CEO of RMG and Chairman, President & CEO of the International Electric Power, LLC (IEP) with the mission to develop energy infrastructure which provides the highest economic benefit to the host country together with the greatest energy independence*
	+ *Currently executing transactions in St. Lucia, Haiti, and Pakistan*
	+ *Learned the key economic drivers for renewable and clean technology as Managing Director and Founder of Complete Energy Holdings, LLC, which owned and operated power generation*
	+ *Learned about all types of generation technology and associated fuels like oil, natural gas, coal and uranium*
	+ *Senior Officer responsible for M&A then operations at Allegheny Energy*
	+ *Managing Director and founding member of Complete Energy Holdings, LLC which employed 110 professionals, had an annual budget of $85M and owned and operated over 1800 MWs of electric generation in the US*
	+ *Awarded “Deal of the Year” in 2006 by Power Finance & Risk in London*
	+ *Founded Twin Pine Capital Resources, which was an investor and transaction advisor in the power generation sector*
	+ *Senior VP at Allegheny Energy, Inc., where he served as Chief Strategic Officer reporting to the CEO and responsible for M&A as well as COO*
	+ *Executed acquisitions of a wall street trading firm and two local distribution companies as well as negotiation of several merger agreements with IPPs*
	+ *Graduated from the University of Pennsylvania with a BA in English and Economics and from the University Of Pittsburgh School Of Law (JD, with honors) where he was Editor-in-Chief of the Journal of Law and Commerce.*

**Enzo Zoratto, Project Development, Financial Advisor**

* **25 years of experience in the infrastructure, environmental and logistics fields where he successfully built and managed several national and international companies and is recognized for his ability to conceptualize, develop and implement successful growth strategies**
	+ *Presently overseeing the development of a Waste-to -Energy project in Haiti to be situated near Port-au-Prince, called “Project Phoenix”. This project is of high interest to Government of Haiti and other stakeholders, including the Clinton Foundation, World Bank, IDB and IHRC*
	+ *Project involves the construction and operation of a WTE facility, which will alleviate the waste generation and storage issues plaguing the City of Port-au-Prince; project has the potential to generate over 10 thousand Haitian jobs; open new industries in mining of fuel sources; create secondary industries in construction materials manufacturing; and serve the greater need for decentralizing dense urban environment in Haiti.*
	+ *Experience with a broad customer base ranging from commercial, to municipal, to state and federal governments with extensive experience in the federal sector. He has worked in countries with emerging economies and possesses the inherent language and cultural skills necessary to be successful in these environments.*
	+ *A native of Canada, began his career as a project engineer on a remote hydroelectric project in the Canadian Arctic with Peter Kiewit and Sons, a large US-based, Construction Company*
	+ *Joined D’Appolonia Consulting Engineers, a world-class geotechnical consultancy, specializing in Nuclear Power and Waste Management, where he served as a Project Manager; D’Appolonia was acquired by The IT Group, a $1.4 billion global environmental and infrastructure company, where over a 20 period, he held leadership positions in engineering, construction, and program management*
	+ *President of Government Services, an $800 million division of the company. The business provided a broad range of turnkey, environmental and infrastructure services to clients through four operating groups - Environmental Management, Facilities Management and Privatization, Military Construction and Civil Construction; under his leadership, the company became the nation’s 25th largest defense contractor in its field.*
	+ *Established GENCO Infrastructure Solutions (GIS) in 2003 as a subsidiary of GENCO Supply Chain Solutions, a $500M, a privately-held company with a predominantly commercial client base*
	+ *Chief Strategic Officer for dck worldwide, and President of dck International, where he oversaw global expansion and operations in Abu Dhabi, Libya, Haiti and other nations.*
	+ *BS degree in Civil Engineering and graduate of the Academy of Music from the University of Toronto. He is a registered Professional Engineer and an American citizen*
	+ *Fluent in English, French and Italian*

**Fahad Qureshi, Senior Financial Analyst**

* ***Five years of increasingly responsible positions in the financial services and renewable energy fields***
* *At RMG, focus has been on making equity and debt capital introductions, negotiating mergers and acquisitions, preparing financial models, business plans and offering documents for client firms.*
* *Worked in an internal M&A group of an industrial gas firm*
* *Reviewed numerous investment opportunities in hydrogen, power, and renewable energy, developed comprehensive financial models to assess these, and presented valuations and actionable recommendations to the executive team*
* *Led financial due diligence for JV transactions with utility firms and acquisition of hydrogen plants*
* *MBA from the Tepper School of Business at Carnegie Mellon University and an undergraduate degree in engineering from the University of Virginia*

## MISCELLANEOUS INFormation

**How did you hear about this contest?**

***Contacts of Mid-Atlantic Technology Research & Innovation Center (MATRIC)***

**Website of your local newspaper:**

[**www.wvgazette.com/**](http://www.wvgazette.com/)

[**www.dailymail.com/**](http://www.dailymail.com/)

[**www.post-gazette.com/**](http://www.post-gazette.com/)

[**www.pittsburghlive.com/x/pittsburghtrib/**](http://www.pittsburghlive.com/x/pittsburghtrib/)

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