



# TALENT DEVELOPMENT ISSUES & OPPORTUNITIES IN THE BIOFUELS INDUSTRY

A FOLLOW-UP REPORT • SEPTEMBER 2008

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## INTRODUCTION

During September 2008, a series of telephone and personal interviews was conducted with a select group of leaders in the biofuels industry as a follow-up to comprehensive research undertaken in June 2007. Both rounds of interviews dealt with talent development issues and opportunities in the biofuels industry.

Interviews were conducted with the following:

- Geoff Cooper, Director of Research, Renewable Fuels Association
- Todd Sneller, Administrator, Nebraska Ethanol Board, Lincoln, Neb.
- Duane Kristensen, General Manager, Chief Ethanol Fuels, Hastings, Neb.
- Angie Konda, Director of Human Resources, ICM, Colwich, Kan.
- Jeff Scharping, ICM, Colwich, Kan.
- William Lee, General Manager, CVEC Ethanol Plant, Benson, Minn.
- Chuck Neece, Director of Operations, FUMPA Biofuels Plant, Redwood Falls, Minn.
- Seth Harder, General Manager, Husker Ag, LLC, Plainview, Neb.
- Ralph Scott, General Manager, Trenton Agri-Products, Trenton, Neb.



When the initial set of interviews for this project was conducted in June 2007, the biofuels industry was enjoying a huge surge of growth thanks in great part to Congressional approval of the Energy Act of 2005 that included a Renewable Fuels Standard (RFS), requiring that 7.5 billion gallons of renewable fuel be in the nation's fuel supply by 2012.

In December 2007, the Energy Independence and Security Act of 2007 was signed into law. This act amended the RFS by increasing it to 36 billion gallons in 2022. This national initiative led to a dramatic investment in and growth of the ethanol and biodiesel industries in the nation.

Over the past 12 to 18 months, the biofuels industry has undergone considerable change due to a number of forces and factors:

- Prices for the primary commodities used as feedstock in biofuels production – corn and soybeans – rose to historic levels, driven in part by increased demand for biofuels production. High corn prices led American farmers to convert more acres to corn – and the resulting loss of soybean acres increased the price of that commodity as well.
- Rising energy costs – with petroleum reaching \$140 per barrel during this period – have demonstrated the clear need for domestic renewable fuels. On the other hand, these energy costs, coupled with high commodity prices, have had a dramatic, adverse effect on the biofuels industry as input costs have escalated over the past year and margins have tightened considerably.



- The “food or fuel” debate has led some policy makers to rethink their position on the biofuels mandates set forth in the most recent energy bill and RFS established. Even though global demand, energy and labor costs have been shown to be the most dominant factors in rising food prices, biofuels have been blamed by many for driving food prices higher by creating greater demand for agricultural commodities. A well-funded public relations campaign spearheaded by the Grocery Manufacturers Association was responsible for much of the misinformed media coverage this past year regarding the relationship between biofuels and food prices. [See example: <http://www.gmaonline.org/publicpolicy/docs/biofuels/BoucherLetter.pdf>]
- All of these factors have led investors and lenders to pull back from the biofuels industry only months after it was a “darling” of Wall Street. This fact, coupled with a general credit crunch due to the mortgage finance situation, has put the brakes on many proposed biofuels projects.

The objective of the follow-up interviews was to determine how these changes in the biofuels industry might have affected talent development and training needs.

The following is a report of the results of these interviews.



## CURRENT STATUS OF THE BIOFUELS INDUSTRY

According to the Renewable Fuels Association, the number of ethanol plants currently operating is nearly the same as in September 2007. A backlog of plants are being built that will come on line during the next 12 to 18 months.

According to Geoff Cooper, formerly with the National Corn Growers Association and now serving as Director of Research for the Renewable Fuels Association (RFA), the “feeding frenzy” of a year ago has subsided. “We used to see new biofuels projects announced on virtually a weekly basis,” he said. “But market forces, availability of credit and other factors have had the effect of slowing down what was an extremely rapid rate of growth.”

Most people in the industry believe the biofuels plants that are currently under construction and close to “launch” will indeed be completed and come on line. In most cases, these plants have already hired workers and are in the process of training them in preparation for production within the next 12 to 18 months.

The credit crunch and the slim margins in biofuels production, however, have put a number of projects on hold – and some will likely never see the light of day. “Once the current biofuels plants are completed and in production, it is likely we will see a significant slowdown in the growth of the grain-based biofuels industry – especially corn ethanol production,” Cooper said.

According to the August 25, 2008 edition of *Feedstuffs*: “The sky-high profit margins of 2006 are long gone, with no hopes of returning soon. Profitability is at a level that allows plants to continue running with a little expansion, but not the excessive expansion as previously seen.”

A changing – and negative – market dynamic over the past year, according to William Lee, General Manager of CVEC Ethanol Plant in Benson, Minnesota, has been deterioration in market perception. “Yes, our margins are lower. And we can’t rely on our golden halo any longer to help increase revenue. Quite frankly, it is a bit tarnished,” Lee said. “The ‘using food to make fuel’ messaging that’s out there is nothing short of biofuels bashing and a demonization of the industry. It’s very unfortunate.”



While talent development issues continue to be a high priority for management such as Lee, he admitted that it is often far easier to work on improving training than it is to improve market opinions.



## AN EVOLUTION IN THE BIOFUELS TALENT

After undergoing a growth spurt in 2007, the industry is now experiencing a period of pullback and retrenching, which has had an effect on the workforce.

Angie Konda is director of human resources for ICM, Inc. of Colwich, Kansas, which provides technology and construction services for biofuels production plants. She said that ICM recently laid off more than 100 workers across the organization – from the shop floor and field construction crews, to specification teams and clerical/support staff.

According to Konda, ICM had plenty of potential work on the docket. At the time of the layoffs, they had more than 40 proposals under consideration. “There was no shortage of interest in building plants. But there was simply no source of funding to build them,” she said.

Konda added that ICM has its “core” employees on board at this time and sees no need to grow in the near future. “The one place we did not cut was our research and development area since we see potential in becoming more of a resource and service provider and focusing a bit less on being a construction/training company,” she added.

Duane Kristensen, general manager of Chief Ethanol Fuels, Inc. in Hastings, Nebraska and chairman of the Nebraska Ethanol Producers Association, says the biofuels industry is approaching the “one generation” mark in its young history. “Many of our employees are in their late 40s and early 50s, so we will likely see a turnover of the first generation of biofuels employees over the next decade or so,” Kristensen noted. “While we tend to train and nurture from within, I expect the industry will continue to need more employees as those with decades of experience begin to enter retirement age.”

For William Lee, CVEC Ethanol Plant in Minnesota, talent development issues have eased somewhat. “Two to three years ago, we were in a hyper-competitive environment. We still have issues to deal with, some plants feeling it more extremely than others, I’m sure. But it just isn’t the feeding frenzy it was back then. We have taken more of a ‘hire local’ approach that has been successful at least for us.”



Chuck Neece, director of operations for the FUMPA biofuels plant in Redwood Falls, Minnesota, has seen another effect on the biofuels workforce in the past 18 months. “Because of the turmoil in the industry, many people with transferable skills have found work in other industries,” he said. “It’s similar to what happened in the airline construction industry when it went through tough times. Qualified people left and never came back. We may have lost some skilled people we’ll need to replace – and quickly – when the biofuels industry recovers from this current slowdown.”

It is also becoming evident that the original guidelines in terms of talent development needs in a biofuels plant may be changing. “When the industry began, there was a bit of a cookie-cutter approach implemented by the technology and construction companies that recommended so many employees of prescribed job descriptions per million gallons of production capacity,” said Seth Harder, general manager of Husker Ag, LLC in Plainview, Nebraska. “I think most of us are learning that we’re both understaffed and undereducated – even among our top people.”

Ralph Scott, general manager of Trenton Agri-Products, a biofuels plant in Trenton, Nebraska, noted the increased pressure for regulatory compliance and reporting on a number of fronts. “Federal and state government agencies are infiltrating our facilities – from EPA to the Department of Transportation to OSHA,” he said. “We’re finding that one lab manager, for example, simply cannot manage all of the reporting and compliance – and run the lab as well. One government agency review or audit consumes a great deal of time and resources.”

Harder agreed. “We all have environmental managers, but they have little or no support. We’re understaffed in our technical and lab areas,” he noted. “We probably will need to add staff in these support areas – and I fully expect that in the near future, virtually every biofuels plant will have a full-time engineer on staff.”

Both Scott and Harder noted that, in most cases, new staff in these areas would add cost and overhead to the plant without necessarily increasing productivity or output. “These would be employees we need to help us work within the regulatory environment – and while we want to do things the right way, these are not necessarily employees who will help us make more biofuels or make more money making biofuels,” Harder added.





In Minnesota, some government action has helped address workforce issues. Lee said that the liberalization of boiler certification regulations has provided flexibility for plants. Whereas these jobs typically took three to four years of training, the provisional first-class license means an inexperienced worker can be on board within two years. “When you need eight of this type of person on your team, it was extremely difficult under the old requirements,” he explained.



## THE IMPACT OF NEW TECHNOLOGIES

As one considers job growth in the biofuels industry, it is important to remember that the industry has been around for just three decades. Still relatively young, biofuels production has been rapidly developing and implementing new technologies to increase efficiency and profitability. As these new technologies emerge, the industry should strengthen and provide a more stable demand for skilled workers.

During a recent presentation to the Nebraska Ethanol Board, Jeff Scharping with ICM spoke of his company's trademarked concept of Total Kernel Optimization™ as a way for biofuels plants to reduce input costs and add products to their output stream.

At the core of Total Kernel Optimization™ is the process of dry fractionation – separating corn into its primary components prior to ethanol processing. This process provides greater flexibility for ethanol producers in terms of product development and marketing – and offers some major benefits in terms of reducing operating costs by recycling co-products of the production process into providing power for the plant itself.

According to Scharping, the addition of dry fractionation to an existing dry mill ethanol production facility could result in the need for *up to seven additional employees*. If an ethanol plant opts to use the dry fractionation process to begin producing food-grade products, the demand for employees will increase further, especially in terms of food science expertise, maintenance and regulatory compliance.

One of the potential benefits of the dry fractionation process is the potential for using co-products of corn processing to actually provide energy to run the plant – reducing the use of expensive natural gas. “If we get into the business of running our own power plants in these ways, we’ll need high-level people with industrial heating and energy training. We’ll also be getting into areas of employee licensure that we have not dealt with in the past,” Harder said.



## THE IMPACT OF NEW FEEDSTOCKS

Federal legislation has targeted the development of biofuels production from non-grain sources. In fact, the role of cornstarch-derived ethanol in the amended RFS is limited to 15 billion gallons – with the remainder of the 36 billion gallons to come from “advanced” biofuels (renewable fuels other than ethanol derived from cornstarch) and “cellulosic” biofuels derived from renewable biomass. Significant federal dollars have been targeted to the development of cellulosic biofuels technology.

According to Cooper, most existing biofuels plants in the Midwest should be able to incorporate the new technology required to accommodate cellulosic feedstock sources such as corn cobs, cornstalks, etc., without a significant change in workforce or skills.

The sheer volume of feedstock required for cellulosic ethanol, however, will create additional jobs in the management and handling of feedstock materials. “The technology to turn cellulose into biofuels will be perfected sooner than the logistics required to manage the incredible volume of these feedstock sources required to produce biofuels,” Cooper said.

Here’s the challenge: Corn and soybeans have a high level of inherent potential energy in each kernel or bean – so a semi-load of grain represents a significant volume of feedstock for biofuels production in the form of starch (corn) or oil (soybeans).

To produce a like volume of biofuels from most cellulosic sources will require significantly higher volumes of feedstock – creating challenges in terms of harvesting/gathering, transportation and storage. For example, instead of one truckload of corn coming into a biofuels plant, there may be six to ten truckloads of cellulosic feedstock (or more) needed to produce the same volume of ethanol, depending on the cellulose source.



Cooper says the transition to cellulosic feedstocks will be more likely to create job opportunities outside the traditional Midwest corn ethanol/soy biodiesel belt. Vegetable waste, grasses, wood chips, forestry waste and municipal waste are all likely sources for cellulosic ethanol production.

“This means that we’ll likely see biofuels plants popping up across the United States, from the southeast to the northeast to the Pacific Northwest,” he added. “We won’t necessarily be adding new types of jobs in biofuels production. We’ll just be adding more biofuels jobs in new areas of the country.” While many of these new jobs will not require skills exclusive to the biofuels industry, they will require skills and training nonetheless.

Neece spoke of new biodiesel technologies on the horizon such as solid catalyst processes and “renewable diesel”, which is being developed by the petroleum companies – but he does not see changes in the types of jobs that will be available. “The curriculum in training may change, but not the basic job description,” he added.

This multiple feedstock approach may also help diminish the impact of fluctuating commodity prices on the profitability of existing biofuels plants. For example, Chuck Neece’s biodiesel plant does not rely solely on soybeans for its feedstock. The plant uses canola oil, poultry grease, sunflowers, tallow and lard as well. This flexibility has allowed Neece’s facility to maintain steady production, even as other biodiesel facilities across the nation have cut production or shut down altogether.



## THE OUTLOOK FOR THE BIOFUELS INDUSTRY

Industry growth and demand for biofuels talent has remained largely flat in the last year due to an industry-wide slowdown and stalled projects. Unfavorable market forces brought on a new set of concerns and priorities in biofuels, including negative market perception and legislative instability. However, new growth is expected outside the traditional “grain belt” states, which will bring the need for additional talent elsewhere across America.

There has not been a significant change in training needs for the biofuels industry, with the exception of increased need for talent in regulatory compliance work. As new technologies and feedstock sources are adopted by more plants, additional talent will be needed to accommodate new processes and larger volumes of feedstock.

According to the May 2008 edition of *Biofuels Business*, it is estimated that by 2015, the biodiesel and ethanol industries will create more than 240,000 full-time jobs in all sectors related to renewable fuels production. “Numbers are equally impressive in countries such as Brazil, where the industry currently employs 400,000 in the largest ethanol producing state of Sao Paulo,” the article said. Industry leaders also anticipate a generational turnover in the biofuels workforce in the next decade, and the educational sector should be prepared to provide support through new talent development.

Todd Sneller, administrator of the Nebraska Ethanol Board, said that talent development needs are not limited to biofuels production. “There are a number of allied industries that serve the biofuels market that will need skilled workers as the biofuels industry continues to grow,” he said. According to Sneller, maintenance, electrical and power plant service, instrumentation, trucking, rail and enzyme companies will all benefit from a burgeoning biofuels industry.

There is no question that biofuels will require continued policy support in the foreseeable future in order to thrive. The food and fuel issue – driven in part by higher food prices – has resulted in Congress considering revisiting the energy bill that established the Renewable Fuels Standard (RFS), which mandated minimum volumes of biofuels in the nation’s fuel supply. Neece characterizes this as policy makers reacting to the “*crisis du jour*”. Still, such kneejerk reactions by policy makers continually pose a threat to the biofuels industry.



On the other hand, there is a piece of legislation called the Open Fuel Standard Act, which is designed to “break OPEC’s monopoly on the international fuel market” by requiring that 80 percent of new automobiles in the United States be flex fuel vehicles (FFVs) warranted to operate on gasoline, ethanol, methanol – or on biodiesel, if appropriate. If this act becomes law, we can expect a rapid effort to build the fueling infrastructure required to handle this wide variety of fuels – and, as a result, another round of expansion in the biofuels industry would likely follow close behind.

Randall Sigle, Statewide Ethanol Training Project Coordinator for Northeast Community College in Norfolk, Nebraska, is optimistic. “In spite of the current challenges in the biofuels industry, the fact remains that fossil fuels still have serious issues,” he said. “We need to look at the big picture in terms of the world’s economic dependence on oil – and what we can do to reduce the impact of oil supply and prices on economic and energy security.”

“As long as internal combustion engines run the world, there will be a need for liquid fuels,” Kristensen said. “Biofuels are not the answer to all of our domestic energy challenges – but they are part of the answer. This is an industry that is not going to go away.”

# EXECUTIVE SUMMARY

Workforce recruitment and training have been identified as two of the most pressing challenges in the biofuels industry today. In order to provide a better understanding of the needs and priorities in talent development, a two-phase research study was undertaken with key industry stakeholders and plant management at ethanol and biodiesel plants. The findings of the study, highlighted below, offer valuable insights regarding the obstacles, opportunities and priorities in hiring, training and developing productive talent.

## **CHALLENGES AND PRIORITIES IN THE BIOFUELS INDUSTRY**

- Talent availability and development represent two of the most significant challenges within the ethanol and biodiesel industries, ranking higher in priority than technology or public policy.
- Employee turnover is an issue, particularly within upper management; experienced plant managers and general managers are at a premium.
- Increased, and more accelerated, training for production/operations staff would be most beneficial in helping plants improve and grow.
- Industry leaders and plant managers recognize the challenge and importance of increasing interest and awareness of career opportunities within biofuels.

## **AVAILABILITY OF QUALIFIED TALENT**

- Production employees are much less likely than management staff to have a two-year college or technical degree and are very unlikely to have a four-year degree.
- The majority of management employees hold a four-year college degree and hold the most hard-to-fill positions within biofuels.
- While major ethanol and biodiesel plant development/management companies have developed their own recruitment and training programs out of necessity, smaller plants struggle the most to recruit and develop qualified employees.

### **CURRENT TRAINING SITUATION**

- On-the-job training is the primary way in which most plants provide education to their own, and other, plant employees.
- Plants currently face a number of obstacles in providing training on the job, including having a lack of qualified training resources and limited time to provide such.
- The biofuels education programs that currently exist widely differ in their approach, ranging from short-term intensive training to customized curricula at individual plants or all-online programs.

### **HIRING AND RECRUITMENT PREFERENCES AND LIMITATIONS**

- Currently, academic degrees are required for laboratory and engineering positions but are not considered a prerequisite for production/operations staff.
- Biofuels companies are looking for employees who have a basic understanding of the production process, science, mechanics and instrumentation.
- Concerned about retaining already hard-to-find employees, some plants prefer hiring local individuals, even if they lack qualifications.
- Plants prefer to hire new employees who possess multi-disciplinary skills, including leadership, experience in equipment operation and understanding of the manufacturing process/technology.
- Educational programs for operations staff could help compress the productivity timeline.

### **PREFERRED TRAINING METHODS AND SUBJECT AREAS**

- Training delivery methods that accommodate long-distance education are acceptable and deemed effective by the industry, particularly in combination with some hands-on experience. Online coursework is most preferred as an alternative to on-the-job training.
- Hands-on experience is a crucial component to employee training, with a number of plants willing to provide internships and in-plant experiences for students.
- Industry stakeholders place high importance on having courses taught by someone who has industry experience and stays in touch with the biofuels industry.
- Plants do not have a strong preference as to what season or time of day employee training is offered.
- Management is willing to actively encourage and, for the most part, financially support their employees' additional training through a college or university if such training does not interfere with employees' work schedule and earns them a degree or technical certification.
- Industry representatives say they are interested in working with colleges and universities on a consulting basis, as well as in talent development.



- Management staff are felt to be a group who could benefit from additional training in leadership skills, environmental and compliance issues, and safety training.

**LONG-TERM HIRING NEEDS**

- As the industry develops in the next five years, ethanol and biodiesel employees will need new or additional skills in environmental and compliance issues, safety, cellulosic ethanol, and fractionation training.
- Ethanol and biodiesel plants anticipate hiring more staff in both management and production in the next two years.