



# Fort Wayne ENGINEERS', Club

Engineers' News

November 2024

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[www.FortWayneEngineersClub.org](http://www.FortWayneEngineersClub.org)



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## November Tour



**When:** Nov. 21st, 2024 @ 6:30 p.m.

**Where:** 1015 W 15th St, Auburn IN 46706

**Details:** Since 1969, C&A Tool has proven itself through dynamic leadership, unparalleled expertise and major investments in the latest equipment—an approach that has helped us remain a leader in the high-precision contract manufacturing industry for five decades.

With three locations, more than 750,000 square feet of manufacturing space, ~600 employees, and \$110M+ in annual revenue, C&A Tool is a member of the MinebeaMitsumi family of companies, a world leader in precision components manufacturing.

Today, the company offers the most-comprehensive combination of applied engineering

expertise, advanced equipment and dedicated in-house production capabilities, ready to meet your most demanding specifications. With on-site metal sintering, turning, grinding, milling and machining—including the industry’s most advanced capabilities in large machining—we have the largest array of for-contract equipment in this hemisphere, on-site and ready to deliver.

<https://www.catool.com/home>

\* Closed toe shoes are required. (no open ankle slip on)

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## October Tour Summary



This is one of twelve nearly identical facilities designed within the last 20 years for real environmental and rural community stewardship. Ongoing continuous improvement ideas have been shared across the twelve locations from Ohio to North Dakota. Six long-term management staff plus a college intern generously stayed after hours to host us and discuss their individual long-haul outlooks. At least five were engineers: mechanical, chemical (quality control), and environmental.

Valero Renewables wishes to call itself a “fuels company” and receives all its inputs from outside sources. This facility produces ethanol and byproducts from corn. Completely different facilities produce biodiesel from soybeans and other fatty substances. ALL of its facilities have been designed and continually upgraded to minimize carbon-scores as well as other environmental impacts. This tour showcased how much has changed in making those concepts credible. As with other tours, continuous improvement is mandatory in today’s world.

Multiple facilities allow crops to be sourced locally with minimal trucking, optimal farming conditions, and close relationships with surrounding communities. Corn prices have minimal impact on financial viability of the facility because value of its products tend to vary along with corn pricing. (Ed.: Presumably, growers also benefit from reliable contracts with Valero and from any corn to fuel legislative incentives.)

FWEC policy in our reports has changed to printing what would be obvious from public sources including street observations. This is done out of respect for the huge investments of our hosts and to encourage our participation.

Trucks with corn are weighed upon arrival and sampled for moisture content, quality, and contaminants. The sampling is done with industry-standard hydraulically-driven probes of the load, followed by standard laboratory analyses. Contamination with soybeans is a no-no. Mycotoxins (if any) affect processing of the corn and use of byproducts for animal feed.

Growers dry and/or store millions of bushels of corn on their farms unless special circumstances occur. Valero has substantial storage capability onsite, both as elevated facilities and as prepared ground for storage under tarps.

Corn is delivered through conventional floor grates and moved sideways by a below-ground conveyor belt to a bucket conveyor. The buckets raise (elevate) the newly delivered corn to the tops of reinforced concrete or steel elevator-style silos. Each silo can then be bottom fed individually or blended (to average out moisture, mycotoxins, etc.) to a dry mill that pulverizes the corn into a flour. Cyclonic collectors add fine dust particles back into the flour. The flour is thoroughly mixed with very hot water. Specific yeast and/or enzymes are then added before fermentation (details may be process secrets). When mature, the mixture undergoes a sequence of superficially conventional spin and evaporative separations.

The solids fraction is dried. The dry meal ("distillers grains") is moved by conveyor to a storage building, which feeds another conveyor as needed to covered hopper railroad cars. Nearly a third of the original corn ends up as solids, which in turn end up as a wide range of animal feed. (Ed.: Solids may provide better availability and profile of nutrients than the original corn.)

Most of the ethanol essentially evaporates from the liquid fraction and condenses into a liquid. A secondary step removes virtually all remaining alcohol. The system averages about 3 gallons (19.7 lb) per bushel (56 lb on average) of corn. Something is added to "denature" the ethanol in order to eliminate alcohol human-consumption taxes, licensing, and related oversight. The denatured ethanol is eventually piped to dedicated railroad tank cars.

Small amounts of corn oil and a corn "syrup" separate from the liquid fraction and are piped for occasional loading into railroad tank cars for use at a Valero biodiesel facility. Corn oil is a component of the corn germ.

Details on airborne emissions, water emissions, and heat sourcing might be proprietary. Much thought has been continuously invested in reducing carbon scores and other impacts in genuinely meaningful ways.

It was clear the facility is closely regulated by various agencies including for wetlands on the

property.

As normal now-a-days, the facility operates 24 hours a day year-round and centrally controlled.

The power control panels suggested modest electrical needs for a facility this size. (Ed.: For a suitable carbon rating, the power would almost certainly be contracted from nearby solar or wind farms such as those of EDP Renewables that FWEC toured last Spring.)

Two systems are not obvious. The larger organization that is Valero must incessantly monitor commodity contracts for crops, fuels, feed, vegetable oils, and more. Fortunately or unfortunately, it is the basis of financial management. Most of this facility's output will be blended with gasoline for domestic use, but some will be shipped elsewhere.

Also not obvious, a view of Google Earth reveals a Valero Renewables rail yard. It is an oval, much like a toy train layout, except the oval has up to five parallel tracks providing 6 miles of marshaling space for Valero's unit trains of tank or hopper cars. With variations, that is 100 cars of circa 100 ton capacity per car. Norfolk Southern normally moves 2-4 trains of ethanol and 2-3 trains of hoppers per week. (Ed.: According to U.S. Farm Report, the major glitch across renewable industries is that Federal policies change faster than facilities can be designed, completed, or break even. Valero seems to be a master at navigating the years-long mayhem.)

All of these complex pipes, conveyors, ducts, and wires must be mapped, labelled, and maintained. Valero is building a new maintenance building. Worker safety and morale seemed high. Commitment to the local community was clear. But, as everywhere, workers are hard to find.

Some would say Bluffton is a smallish rural town. But it is active, has ample jobs with often good pay. And, lack of light pollution. We left for home with a gorgeous clear-air sunset painting one horizon, a huge moon rising on the other, and a comet visible near Venus. Someone from the facility turned around on his way home, to make sure I was okay.

<https://www.valero.com/about/locations/bluffton-plant>

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## Interested in Hosting a Tour?

Contact us today!

**Host a Tour**

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## Items of Note

FWEC member Rod Vargo is Chair of the 28 year-old and all-volunteer [Utility Advisory Group](#), which formally advises Fort Wayne City Utilities and often City Council. Your comments are welcome at [rodvargo@comcast.net](mailto:rodvargo@comcast.net)

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## General Club Info

Fort Wayne Engineers Club dues are \$0. Donations are welcome but strictly voluntary. In recent years, club funds have helped support Discover-E, the Regional Science and Engineering Fair, annual bridge building contests in schools, academic awards, networking events, mentoring, our website, and facilitating free tours.

Please see [FortWayneEngineersClub.org](http://FortWayneEngineersClub.org), [LinkedIn](#), or [Facebook](#) for updates on current Club activities, other news, and past newsletters.

Those participating in activities or hosting tours through FWEC do so strictly at their own risk, including disease exposures. Participation in club events is voluntary, free, nonprofit, and solely for the benefit of participants and the community at large. Anyone with an interest may participate unless restrictions are specified for specific events, such as minimum age or minimum safety attire.

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## FWEC Roster for FY2024-2025

President: Nathaniel Wisel

Vice President: Mindy Robinson

Secretary: Rod Vargo

Treasurer: John Magsam

First-year Board Members: Marna Renteria, Mike Magsam

Second-year Board Member: Dave Gordon, Bert Spellman

Third-year Board Member: Ryan Stark, *Open*

Editor of Engineer News: Nathaniel Wisel

Membership and Contact Chair: *Open*

Northeast Indiana DiscoverE Chair: *Open*

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## Job Posting and Resumes Listed

The club accepts both job openings from around the area, as well as resumes from those seeking employment. Please submit these to the following email address:

[Info@FortWayneEngineersClub.org](mailto:Info@FortWayneEngineersClub.org)

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## **Advertise in the Engineers' News**

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