

## **Village of Ellsworth**

### **Bigadan Denmark Facility Tours**

The Village Board authorized travel for two Village Trustees (Hines and Borner) as well as the Administrator/Clerk-Treasurer (Roy) to Denmark to tour Bigadan digester facilities. The Board approved travel costs up to \$8,000.00. The 2024 Village Budget allocated \$13,200.00 for Economic Development. These funds were used for the trip expenses. All expenses were made in alignment with the State of Wisconsin Travel Guidelines as well as the U.S. State Department foreign travel regulations. The Village travel expenses were:

Flight	\$ 4,558.50
Per Diem	\$ 1,194.00
Hotel	\$ 1,228.98
Mileage	\$ 58.95
Currency exchange	\$ 8.00
Airport Parking	\$ 103.00
<b>Total</b>	<b>\$ 7,151.43</b>

The trip occurred February 27 through March 2. We landed in Billund, Denmark the morning of Wednesday, February 28<sup>th</sup>. During the trip Bigadan officials offered us access to all aspects of the facilities. We were allowed to ask any questions and take any pictures. The trip included tours of three Bigadan facilities as well as the Bigadan Headquarters. During the tours we were able to have discussions with staff, local government officials (Klipleve and Horsens), and nearby residents of the Kalundborg facility.

#### **February 28, 2024 – Klipleve Bioenergy:**

The proposed digester in Ellsworth will be based on this facility and will operate in a similar manner. This is the newest Bigadan facility, the facility began full operations in 2022. Upon arriving at the site, we met with staff from the facility as well as a local municipal official. The discussions outlined the operation of the facility and the concerns that they received. The initial concerns when the facility was proposed were regarding odor, similar to the concerns raised in Ellsworth. There were odor issues during the commissioning process of the facility. This is when the plant begins operations. The gas that is produced is not of a high enough standard to be distributed into the gas line. This lower grade gas must be flared. Odors during this time were also created as the biofilter is being established. Bigadan discussed how communication is essential regarding odor. They established a Facebook page to provide updates to surrounding landowners about any issues. The odor issues that occurred tended to last an hour or two each day during the commissioning phase. The local municipality did not express any concerns with the facility. No environmental issues were reported and they have been happy with the communications and the operation.

Facility has 100 trucks per day (arriving and exiting/200 total). The Ellsworth facility is proposed to have 150 trucks per day (arriving and exiting/300 total). Traffic at the site did not appear to be excessive. There was no queuing of trucks or trucks waiting to enter the building. The process was orderly and appeared to be efficient. The facility uses co-digestion of dairy and pig manure, chicken litter, industrial

food waste, and organic food waste (organic food waste is not proposed at the Ellsworth facility). The organic food waste was delivered in tarp covered containers. This type of container did emit a strong odor. The manure was delivered in sealed containers, similar to what is proposed in Ellsworth. These trucks and containers did not have an odor.

Some of the receiving building doors were not in working order. One of the entrance doors did not fully close after a truck entered the building. (This was pointed out to the facility manager and by the end of the tour the entry door was working properly.) There were also problems with the exit doors of the receiving building. The previous week a driver forgot to remove the product receiving arm before exiting the building which damaged the wiring on the exit doors. The exit doors could not be closed while we were there. The odor within the receiving building is strong and unpleasant. The building has a negative pressure to keep the odors within the building when the entry or exit doors are open. Outside of the receiving building, in the middle of the facility, there was a slight odor which was not a nuisance. The three Village representatives were in agreement that the odor would not be present at the property lines. We do not believe odor from the facility would be an issue for adjacent property owners.

The nearest residence is a farm approximately 1000 feet from the facility. There is a McDonalds approximately 2500 feet from the facility. The facility did not flare the gas while we were present. Flaring is required monthly at the facility as a safety check. We toured all aspects of the facility, including walking to the top of the digesters. Stormwater from the site is used in the process. The facility and operation was impressive, orderly, and any odors were minimal.

### **February 29, 2024 – Bigadan Headquarters:**

The following day we met at the Bigadan Headquarters to hear about their business as a whole and what can be expected at the proposed Ellsworth facility. Bigadan began prioritizing building, owning and operating facilities around 2010. They have over 30 years of experience in the industry which gives them a strong position to resolve issues as they arise. All facilities are built to Danish standards (high environmental standards). They have found that the reception and pretreatment are the biggest difference between digesters and reception has the biggest impact on odor. There will be odors with the commissioning (starting phase). The odor is not constant but will likely be present daily one to two hours. Communication with neighbors is vital. All new facilities will be managed by Bigadan Denmark staff for a minimum of 5 years before turning operations over to local staff. If approved, the initial Ellsworth facility manager will have 30 years of experience. The biofilter is very important in managing odors. Carbon-based biofilters are superior. Bigadan has established an equipment replacement schedule instead of waiting for the equipment to fail. Compressed Natural Gas capability is important as the company moves forward (used in trucking).

### **February 29, 2024 – Horsens Facility:**

Horsens facility has co-digestion of dairy and pig manure with food waste. The site has CO<sub>2</sub> production, BioLNG production as well as a CNG filling station for trucks. The layout and production of this facility is different to the one in Kliplev. Trucks were arriving in an orderly fashion. One of the exit doors of the

receiving building was not closing properly. This was pointed out to management. Odor within the receiving building was strong. Outdoors there was an odor present, which was stronger than the odor at the Kliplev facility. One of the storage tanks (digestate) had the top removed and the materials were being removed by a backhoe. This is necessary periodically (approximately every 5 years). The odor of the digestate is not as strong as the newly received materials. Excess heat from the facility is used in a heating district system which makes heating less expensive for nearby uses. A heating district system is not in the design of the proposed Ellsworth facility but could be added in the future. Overall, the operations were orderly.

A local municipal official was present and did not express any concerns about the facility.

### **March 1, 2024 Kalundborg Facility:**

The Kalundborg facility is an industrial biogas plant where the vast majority of input is industrial by-products. This facility has neighbors close to the plant. The facility began operations in 2018. The plant has about 120 trucks per day (240 total) during the peak times of harvesting and planting. There is a neighborhood approximately 2200 feet from the facility in the direction of the prevailing winds. Neighbors were not aware that the facility was being constructed. When operations began many complaints were received. There were production and supply issues which caused problems at the site. There was no form of communication between the facility and the neighbors. Bigadan reviewed operational aspects of the site to identify improvements to address the concerns raised by the neighbors and open communications.

All doors appeared to operate correctly. The exit doors are on an automatic timer to close after the trucks exit. The odor within the building was the strongest of all the facilities that were toured. Outdoors at the site odors were present, but again not likely to cause issues for neighboring properties.

### **March 1, 2024 Kalundborg neighborhood visit:**

We were given the opportunity to visit the nearby neighborhood independently to speak to the residents about facility. We spoke with two different property owners:

- Resident 1 - 4 year resident, no odors noticed and no concerns living nearby
- Resident 2 - Odors when the facility was first started. No odors in the last 10-12 months. Receiving updates from facebook.

The comments from the two residents verified what we were told by Bigadan.

### **Conclusion:**

The tours provided were very thorough. Even though we witnessed problems at some of the facilities (door issues), all facilities we toured were operated very efficiently and professionally. The facilities are very large with an "industrial" appearance. The odors within the buildings are strong. Outdoors, within the sites, the odors are minimal and not likely to leave the site. Bigadan was adamant that instances of

odor will occur from time to time. The commissioning phase (startup) will have the greatest likelihood of odors. The Kliplev plant was very impressive and the odor at the site was very minimal. With Kliplev being the model for the proposed Ellsworth facility all the Village representatives agreed that odor at this site and possibly Ellsworth is not an issue. It was also agreed by all that odor should not be a main concern regarding the permitting of a facility in Ellsworth. Truck traffic at the sites were very efficient, we did not witness any trucks waiting to enter the site or a building. Bigadan has taken what they have learned from their various facilities and integrated that into its other sites.

We would have liked to talk to more of the neighbors of the Kalundborg plant, but the number who were at their residence and language barriers limited it to two interviews. However, those two interviews verified what we were told by Bigadan.