

# VILLAGE OF ELLSWORTH

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Bigadan Digester Tours  
Denmark

# Expenses

- 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. The expenses for the trip came from these funds.
- All expenses were made in alignment with the State of Wisconsin Travel Guidelines as well as the U.S. State Department foreign travel regulations.

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

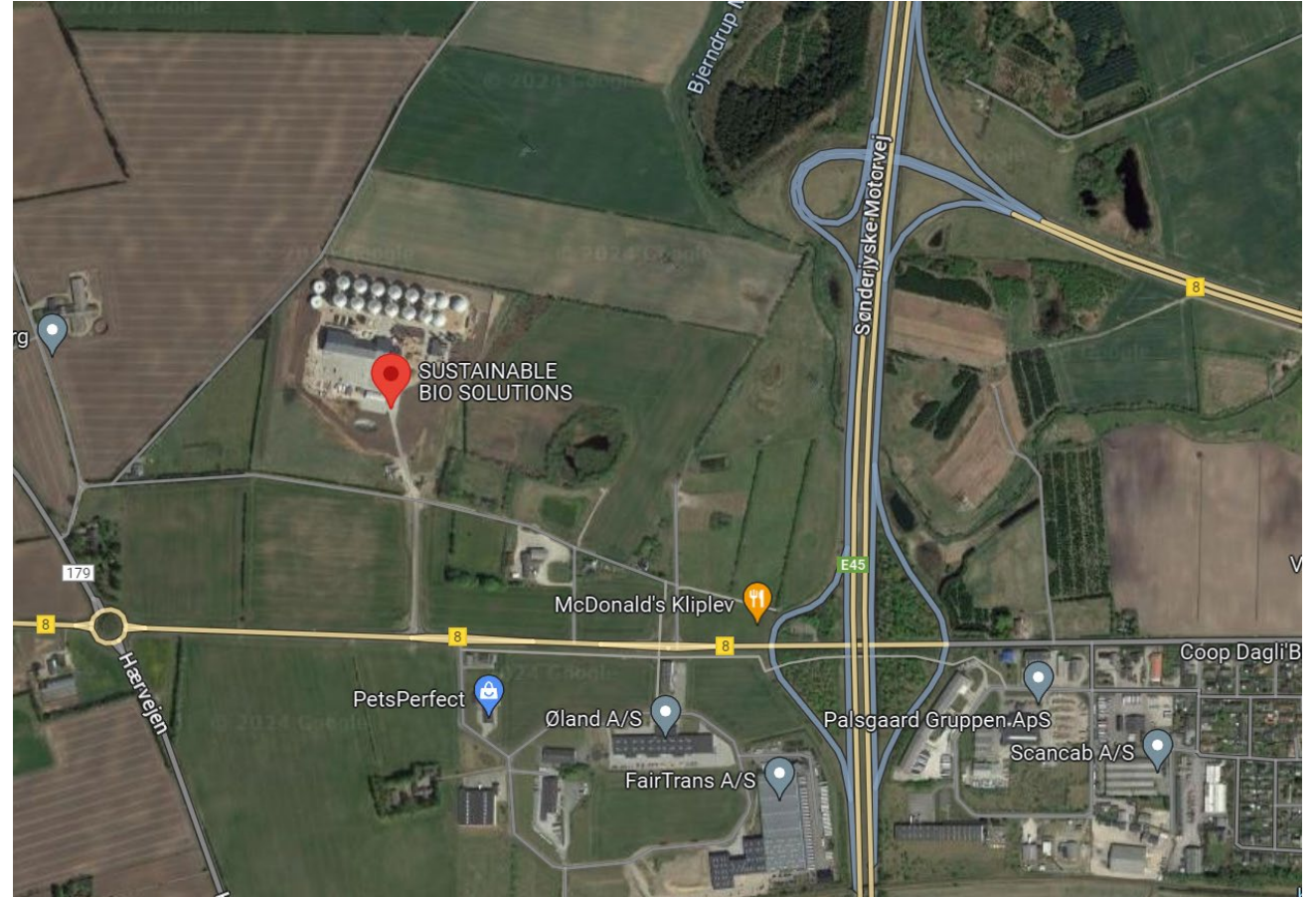
# Klipleve Facility

- The proposed Ellsworth Digester is based on the Klipleve Plant.
- We met with plant staff and a local municipal official.
- The Klipleve Plant began operations in 2022.
- The facility uses co-digestion of dairy and pig manure, chicken litter, industrial food waste, and organic food waste
- Facility has 100 trucks per day (200 total trips).



# Klipleve Facility

- The nearest residence is a farm approximately 1000 feet from the facility.
- There is a McDonalds approximately 2,500 feet from the facility.





# Kliplev Facility

- The local municipality did not express any concerns with the facility. No environmental issues have been reported.
- 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.



# Kliplev Facility

- The manure was delivered in sealed containers, similar to what is proposed in Ellsworth. These trucks and containers did not have an odor.
- We witnessed trucks being washed before exiting the building.



# Kliplev Facility

- 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.





# Klipleve Facility

- 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.





# Klipleve Facility

- 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.



# Kliplev Facility



# Kliplev Facility

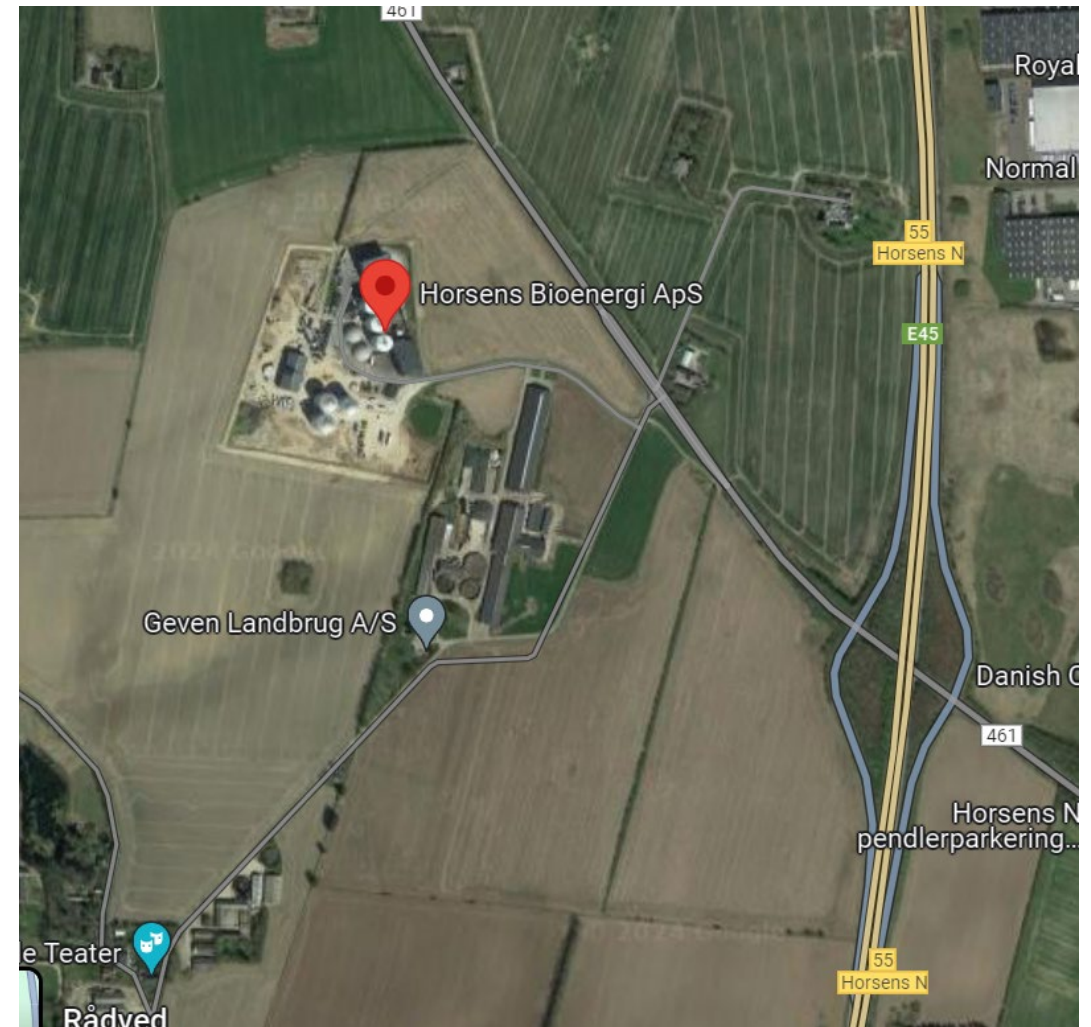
- Overall, the facility and operation was impressive, orderly, and any odors outdoors were minimal.





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



# Horsens Facility

- 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.



# Horsens Facility

- 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.





# Horsens Facility

- Excess heat from the facility is used in a heating district system which makes heating less expensive for nearby uses.
- Overall, the operations were orderly.



# Kalundborg Facility

- The Kalundborg facility is an industrial biogas plant where the vast majority of input is industrial by-products.
- The facility began operations in 2018.
- The plant has about 120 trucks per day (240 total) during the peak times of harvesting and planting.



# Kalundborg Facility

- 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.





# Kalundborg Facility

- 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 also caused problems at the site.
- Bigadan reviewed operational aspects of the site to identify improvements to address the concerns raised by the neighbors and open communications.



# Kalundborg Neighbor Visit

Independently, 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.



# General Information

- Bigadan began prioritizing building, owning and operating facilities around 2010. 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.
- The tours provided were very thorough. Even though we witness 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.



# General Information

- The odors within the buildings are very strong. Outdoors, at the site, 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.
- With Klipleve being the model for the proposed Ellsworth facility, all the Village representatives agreed that odor from the proposed Ellsworth facility is not an issue and should not be a main concern regarding its permitting in Ellsworth.
- Truck traffic at the sites were very efficient, we did not witness any trucks waiting to enter the site or a building.
- 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.
- Bigadan has taken what they have learned from their various facilities and integrated that into its other sites.