



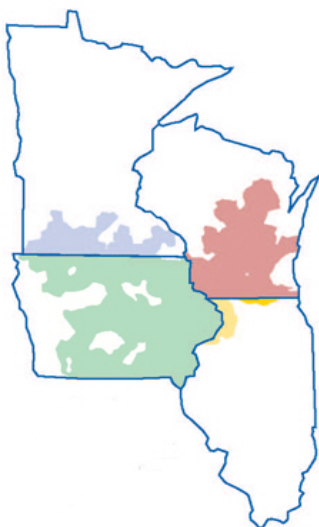
Electric and Gas Loads for Ethanol Plants- Midwest Rural Energy Council, Feb 23, 2007

John Kayser, PE-Team Leader, Delivery System Planning

1

We're on for you.™

Alliant Energy



2005 Statistics	Totals
Maximum peak hour demand (MW)	5,932
Number of electric customers	990,406
Number of natural gas customers (excluding transportation/other)	418,288
Utility electric sales (thousands of megawatt-hours)	33,088
Utility natural gas sold and transported (thousands of dekatherms)	114,573

2

We're on for you.™



Ethanol Overview

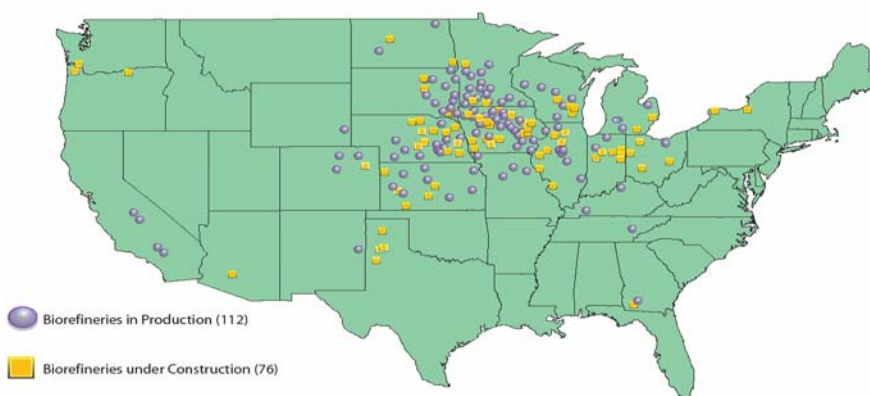
- The number of ethanol plants being constructed is growing.
 - According to the Renewable Fuels Association there are currently 113 ethanol plants in the US with a capacity of 5,583M gal/yr.
 - 78 plants are under construction or expanding that will add an additional capacity of 6,243M gal/yr.
- 83.8% of the current ethanol capacity in the US and 61.4% of the planned expansion is from plants in the states of IL, IA, MN, NE, ND, SD and WI.

3

We're on for you.™



U.S. Ethanol Biorefinery Locations



Source: Renewable Fuels Association
1.29.07

Ethanol Plants in Alliant Energy Territory

- Alliant Energy currently serves thirteen ethanol plants in the IPL and WPL territories.
 - Seven of the plants take electric service only, three plants are natural gas and three are take both electric and gas service.
- There are also seven plants either in construction or expanding their current output.
 - Four plants are expanding.
 - One electric, one gas and two electric and gas.
 - Three new plants under construction.
 - Two electric and one gas and electric

Possible Plants in Alliant Territory

- We also have 30 additional plants that have inquired about service on the Alliant Energy system.
 - The plants range in sized from 30M gallons to 100M gallons.
 - The majority of the plants are 100M gallon plants.
 - This can be a drain on planning resources as they are continually evaluating service to new plants.
 - This can also create uncertainty for budgets as the likelihood of specific plants going in service is debated.

Typical Loads at Ethanol Plants

- Generally there are two sizes of ethanol plants siting in our territories. They are either 50M gal/yr or 100M gal/yr.
- The demand for the plants are shown below:
 - Electrical Load
 - 50M gal/yr –5MW
 - 100M gal/yr – 9.5MW
 - Plants have a high load factor ~80%.
 - Natural Gas Load
 - 50M gal/yr - 5,000 decatherms/day
 - 100M gal/yr - 10,000 decatherms/day

Electric Infrastructure

- Depending on location infrastructure needs can be significant.
 - Most plants in rural locations require transmission extension and a new substation to serve the load.
 - Most 100M gallon plants can be served from a substation with one 10/12.5MVA or 12/20MVA transformer.
 - In some cases with plants locating near urban areas we have been able to serve the load with existing distribution infrastructure.
 - This has been for 50M gal/yr plants.
 - As these plants contemplate expansion we are looking to add substation capacity or a dedicated substation to serve the load.

Distribution Planning Requirements

- Need to assess the plants proximity to existing distribution infrastructure.
 - Majority of plants site in rural areas of our service territory.
 - Most rural systems do not have transformer or distribution capacity to serve the load of an ethanol plant.
 - The vast majority of our rural substations have less than 10MVA of capacity.
 - A new or upgraded substation is usually needed.
 - Alliant asks the developer to provide land for a substation as they are laying out the plant.
 - We will request this even if we serve the plant from one of our existing substations.
 - This allows for flexibility in case the plant expands or other load locates in the area.

Transmission Planning

- Alliant has provided service to all of the ethanol plants from the 34kV or 69kV transmission systems.
 - There have been proposed plants that would have been served from the bulk transmission system, but these plants never materialized.
- The planners look at the proposed site in relation to the existing transmission system.
 - The system will be analyzed to see the impact of the additional load.
 - The planners evaluate system performance with the addition of the new load to ensure the system has adequate capacity and can maintain voltage.
- Depending on location a line extension may be required to serve the new substation.
 - If we need an extension we will install a radial feed to the sub.

Contingency Support

- Providing contingency support for the plants is sometimes difficult.
 - We have had plants site and/or inquire about service on our 34.5kV sub-transmission system.
 - Providing 9MWs of capacity with back-up is difficult in most locations.
 - Other plants on the 69kV system face the same issues.
 - There are plants where we have constructed radial 69kV lines to feed the substation.
 - No contingency back-up for loss of the line.
 - In most cases Alliant does not install two transformers in the substation, so the plants are at risk for transformer failure.
 - Plants near urban areas typically have some contingency support.

Gas Infrastructure

- The existing gas systems rarely are capable of serving the ethanol plants.
 - Access to one of the main interstate feeder lines is usually needed to serve the loads.
 - We usually design either a 4" or 6" pipeline to serve the plant depending on the load requirement and accessible pressure.

Developer Considerations for Energy

- Proximity to interstate gas pipelines or transmission lines will result in the least cost.
- Communication between the developer and the utility early in the process can help to minimize infrastructure upgrade costs.

Pros and Cons of Ethanol Plants

Pros

- Ethanol plants provide a significant load growth to our rural systems.
 - Load growth is important in areas where we have low or negative growth on the system.
- Plant provide significant economic impact in the communities where they locate.

Cons

- The plants require significant investment to serve the load.
 - This competes with our normal distribution and transmission budgets.
 - Could cause the system to age further as investment is moved from rebuilds to investment in ethanol.
- The long-term viability of ethanol plants is still somewhat unknown.
 - Are the plants going to be there 10-15 years from now?

Summary

- Ethanol plants provide opportunity for load growth in areas that currently see little or no growth.
- There is significant investment to serve the plants.
- We will continue to see plants inquiring about service.
- Long-term viability is unknown.

Questions

