



Biomass Power Generation  
**Utility Uses Farm Waste to Generate Power  
and Capitalizes on Revenue Streams**





## THE SITUATION

An electric power generating facility in Benson, Minnesota was designed to use non-fossil fuel as the energy source in the boiler. Poultry litter obtained from area farms consisting of excrement, feed, feathers and wood particles is the fuel for the steam-generation process.

Not only is the litter a good source of energy for the power producer, but the ash collected from the burn process is nutrient-rich and can be sold as fertilizer.

**THE FUEL GENERATES 55 MWS,  
MAKING IT THE LARGEST  
POULTRY LITTER-FIRED POWER  
PLANT IN THE UNITED STATES.**

The facility contracted a third party to transport the ash from the bottom ash conveyors to a warehouse 200 yards from the plant where it's processed and sold as fertilizer.





# THE CHALLENGE

CDM was contracted to provide a complete system that covered the conveying distance from the plant to the neighboring property and included the following:

- DESIGN LAYOUT

- DROP-FORGED CHAIN

- EN-MASSE CONVEYOR

- DRIVES

- STRUCTURAL STEEL TOWERS

- CATWALK TRUSSES

In the event of boiler failure, the conveyors were also required to handle the unburned fuel at a rate that exceeds 20 tons per hour (TPH.)





# THE SOLUTION

CDM started by selecting the optimum chain for the application, then designed the other components around it.

## Design & Structural Considerations

CDM addressed key considerations for power, scale and economy in the following ways:

- Designed En-Masse conveyors to operate at minimal chain speed and HP consumption
- Used chains with a hardness formula able to withstand abrasive ash
- Limited the number and size of conveyors used
- Accounted for height and distance across the properties
- Trusses accommodated truck traffic and avoid utilities
- Provided easy access to conveyors, service platforms and towers for maintenance

**EN-MASSÉ CONVEYORS  
ELIMINATED THE NEED  
FOR PHYSICALLY LARGER  
CONVEYORS WITH GREATER  
HP REQUIREMENTS AND DUAL  
STRAND CHAIN ASSEMBLIES  
WHILE MITIGATING  
CATASTROPHIC FAILURE.**



# THE RESULTS

**THE NEW CONVEYORS  
CONSISTENTLY AND  
RELIABLY MOVED ASH  
FROM THE BOILERS TO THE  
PROCESSING FACILITY ON THE  
NEIGHBORING PROPERTY.**

The design, selection and engineering of the ash handling conveying system and structural supports took into account the characteristics of the material, volume, conveying distance and accessibility requirements. These elements were used to calculate the required chain strength under acceptable chain pull.

The goal was to provide durable conveyors that required the least amount of HP and minimal maintenance. This allowed the utility company to turn the farm waste into a consistent revenue stream thanks to the CDM design.

