Alternative Fuel Resources in today's world

USA Farmers

BUILDING PRODUCTS S M A R T

American Corn is Our Renewable Resource
Clean, Natural and Safe

Corn Fueled Boiler Plants
Replace Fossil Fuel and Decrease the Cost of Energy

The Fuel Source:

Commodity - Corn is grown, dried, mechanically de-hulled and transported in bulk quantities in the United States for various uses including food, feed, corn by-products, ethanol production, etc.

CO_2 neutral - Corn is environmentally neutral when burned as a solid fuel in a boiler plant. In addition, oil/gas fossil fuel emissions are displaced completely when oil/gas is substituted for corn.

Safe - Corn does not contaminate the soil or ground-water if it is spilled.

Fuel Supply Chain:

Available - Corn is readily available throughout the United States. The distribution and delivery network consists of shipping, railway and trucking to service an existing mature agricultural and livestock industry.
Over 10,000 million bushels (280,000,000 tons) is produced and used in the United States annually.

Fuel Cost Comparison:

Competitive - Corn can be purchased and delivered for about $2.70 per bushel based upon a 25 ton delivery or more. The price may vary based upon delivery point.
The average heat content of bone dry corn is 8,500 btu's per lb. When you account for moisture it reduces the actual btu content to 7,000 btu's per lb. This equates to a fuel cost of $6.89/mmBtu of heat value.

Buying corn would be equivalent to buying your fossil fuel at the below listed prices. If you're paying more than the fuel prices listed below, you're paying too much.

- No. 2 Grade Yellow Corn Price $2.70/bushel
- Natural gas equivalent price of $0.69/therm
- No. 2 fuel oil equivalent price of $0.96/gallon
- Propane equivalent price of $0.65/gallon

Fuel Price Stability:

Price Stable - Corn prices have been very stable and will continue to be on a going forward basis. The following chart represents corns price stability over the last 20 years.

In general the average price for the past 20 years was $2.35 per bushel with a recent 5 year average of $2.20 per bushel. Weather is a factor in the high and low cost years.

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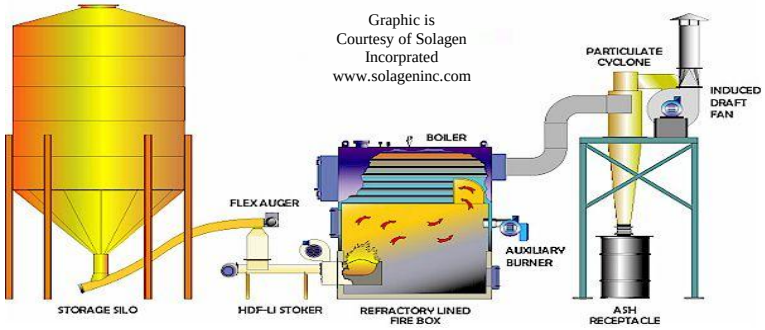
SMART BUILDING PRODUCTS

Corn Based Boiler Plants Saving Energy and the Environment

Fuel Delivery :

Delivery is accomplished via trucking. Trucks with trailers capable of delivering 25 to 35 tons at a time are simply driven to the facility where the corn is either auger fed or bucket elevator fed into a silo system. More complex solutions are also available based upon site conditions.

Fuel Storage: The storage systems utilized for corn are standard readily available silos made from 30-year galvanized steel and installed on a simple concrete pad outside the facilities boiler room. Systems can be erected with heights not to exceed 20 feet which is generally less than most buildings. The silos can be enclosed with fencing to improve security and reduce the risk of accidents.

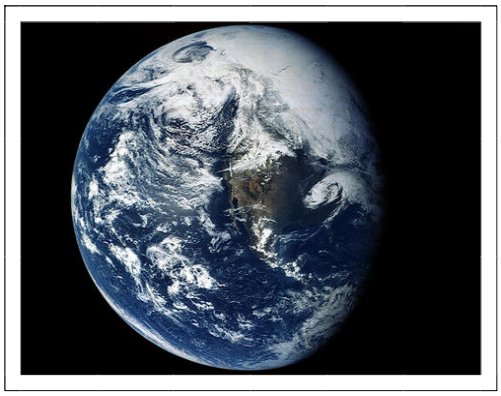


Boiler Plant Technology: The boiler plant is a biomass based system with a firebox, automatic feed stoker with under-fire air. The system can be configured to produce hot water, low or high pressure steam and can be couple with a steam let down turbine for additional electric generation benefits. Boiler's range from 100 hp to 1,500 hp.

Control Systems: Control systems are also incorporated to provide maximum control and integration with existing fossil fuel systems. The biomass boiler plant also incorporates a back up burner firing on either natural gas, propane or oil in the event of an interruption of feedstock delivery. This redundancy results in continuous operation under extreme conditions.

Environmental Benefits :

Corn biomass is CO2 neutral and is completely non-toxic. Biomass reduces exhaust emissions, is renewable every 120 days, is abundant, cost stable, may qualify for emissions credits. If corn is spilled, it does not contaminate the soil or ground water and does not require remediation. Corn biomass is safe and does not require special permitting.



Feasibility Study :

To determine the feasibility of this boiler plant technology at your facility, it is important to perform a preliminary study to assess the impacts and benefits.

Contact Information:

Mr. Eric Ackerly
Smart Building Products
1180 Route 32
Wallkill, NY 12589
www.smartbuildingproducts.com
(845) 566-9329 phone
(845) 566-8620 fax

National Corn Growers Association