

RESULTS

- IPRO 349 researched the categories of generating energy and process flow chart for two cases: large scale and small scale
- Small scale considers just the farmer growing the corn using the corn stover as an electric power source. Not only was this case energetically and economically feasible, but farmer's can also use heat generated from the corn stover in cogeneration
- Large scale considered powering a 50 Megawatt/day plant using stover from multiple farmers. This case was also economically and energetically feasible.

CONCLUSION

- Our team explored the several benefits of converting corn waste that would otherwise be left on the field for no further use to a commodity that could provide power and heat to numerous facilities. Collaboration of the work of both the business and research team has led to a final conclusion which describes all the logistics taken into consideration. Additional equipment costs/requirements by future IPRO teams would further support that corn stover is indeed a novel fuel for generating electricity.

Theoretically, between 35 and 195 farm houses could be powered by 1 farm's stover!

Acknowledgement

- http://www.chemisar.com/images/co2_cycle.jpg
- Antares Group Inc., 2003
- Energiestro
 - http://www.energiestro.com/images/Co-generation_Energiestro.jpg
- Anama Energies Pvt. Ltd.
 - http://www.anamaenergies.com/cogen_steam.htm
- Engineering Suite101.com
 - http://engineering.suite101.com/article.cfm/millions_to_aid_biofuels_research

Presented by

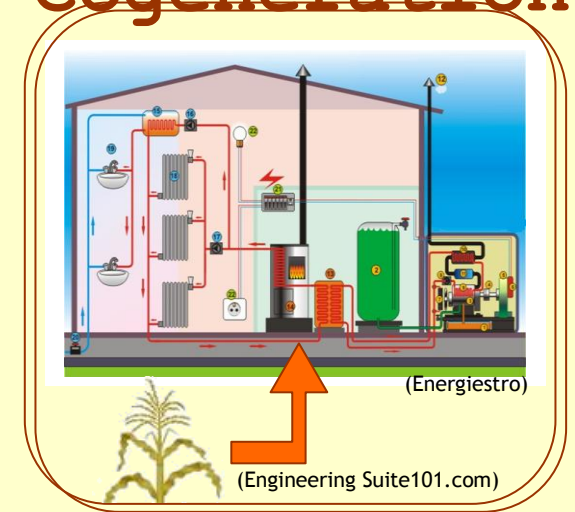


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IPRO 349 Solid Fuel from Biomass for Cogeneration

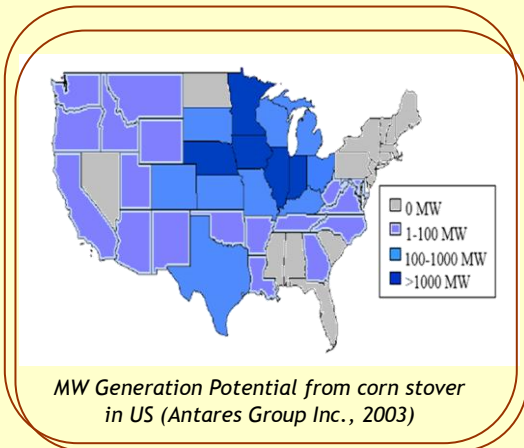


Why Corn Stover?

Illinois currently generates half of its electricity with fossil fuels. Not only are fossil fuels a nonrenewable resource, they emit several toxic compounds into the atmosphere when used. The consequences of continued fossil fuel use will affect future generations, so alternative fuels need to be researched **NOW!** IPRO 349 investigated the possibility of corn stover as an alternative fuel to generate electricity in Illinois. Corn stover consists of the leaves and stalks, but not the corn itself.

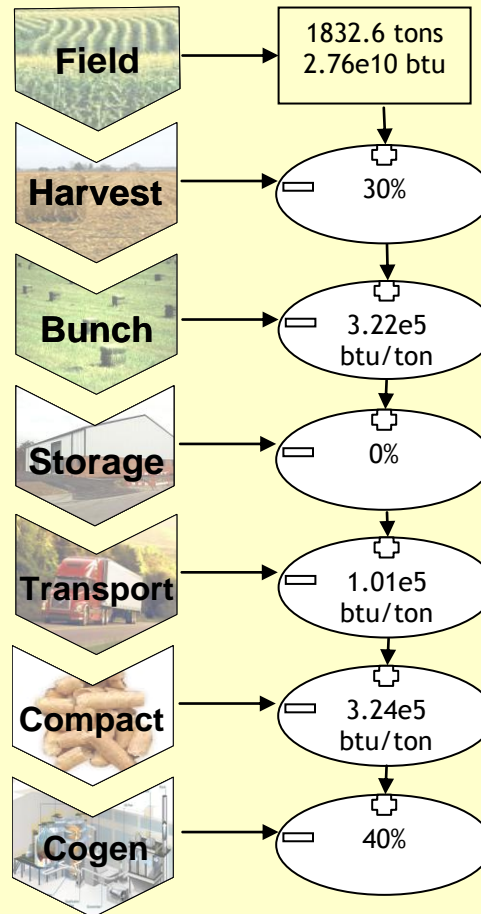
The Future of Fossil Fuels

Fossil Fuel	Current Reserves (billion barrels of oil equivalent BBOE)	Current Consumption (million BOE/day)	Years until depletion
Oil	1,277,702	77	45
Gas	1,239	47	72
Coal	4,786	54	252



Objectives

- Examine the logistics for the collection of stover in Illinois.
- Conceptualize the technology needed, in the form of a process flow sheet.
- Form a conclusion that evaluates the overall energy and economic potential of such an approach.



10.8 GW-hrs/year from 1 county of farms

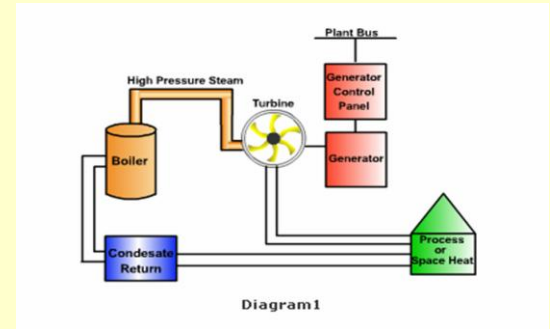
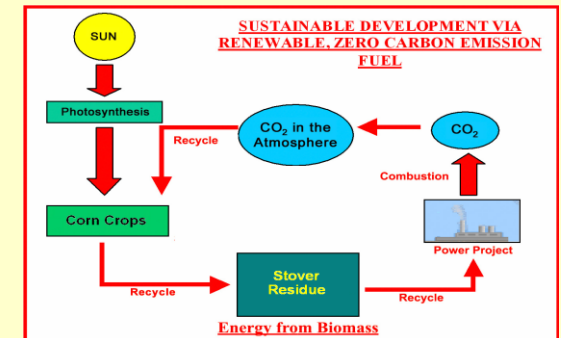


Diagram1
(Anama Energies Pvt. Ltd.)

Why Cogeneration??

- Cogeneration produces a given amount of electric power and process heat with 10% to 30% less fuel than it takes to produce the electricity and process heat separately
- Higher efficiency than normal electricity generator
 - Normal generator: 33%
 - Co-generator: 60-90%



(http://www.chemisar.com/images/co2_cycle.jpg)