Possible Opportunities in Skid-Mounted Gasification of Agricultural Waste

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What is an offset?

Any Alternate activity that can compensate for another: cut a tree, plant a tree

What are the core rules for carbon offsets?

- Largely co-op of Ag producers
- Full Life-cycle
- New Activity - not in planning schema
- Baseline ?
- Land-use Effects

Some limitations

Can’t Sell Bio-Energy and anticipate in Offset (no double dipping)

Very difficult market to Organize

Very poor structure of trade

Need flexible yet predictable qualification rules

Alternatives

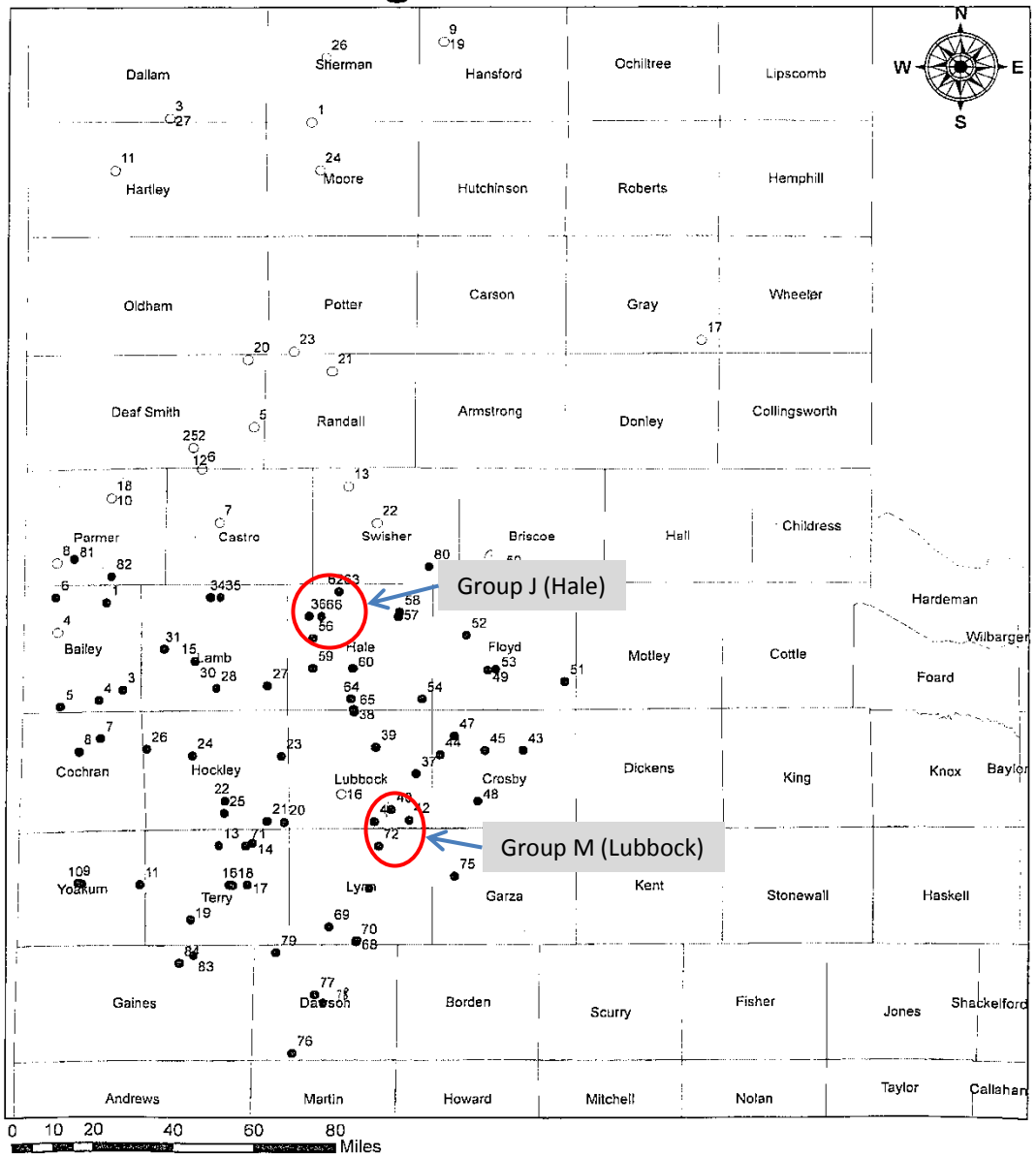
Electricity Markets – Peaking Power

Use of residuals – avoids food for fuel
land-use substitution

Supplement not supplant coal more profitable

One Example

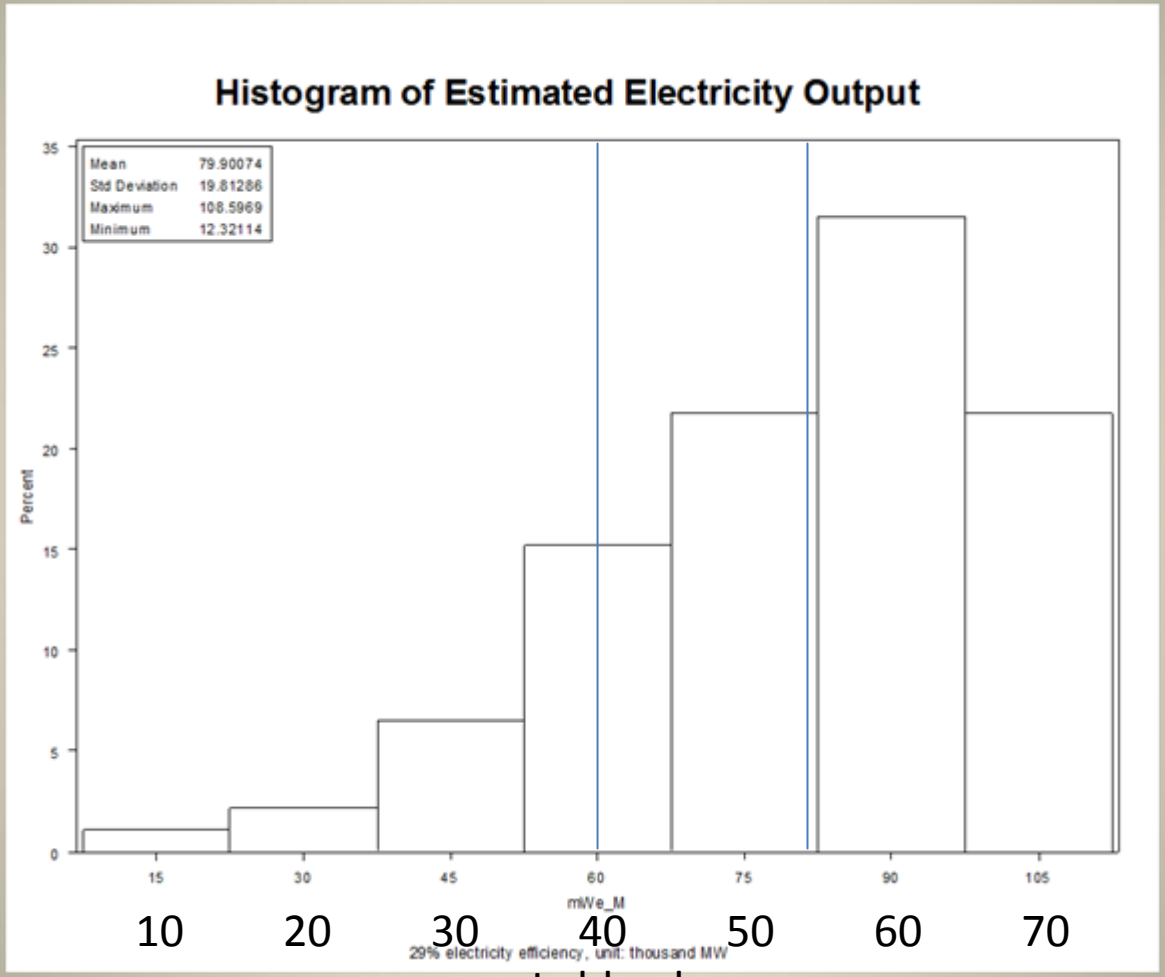
Location of ginneries and feedlots



Average Gin Trash in 10M Grouping
80000
70000
60000
50000
40000
30000
20000
10000
0
Group A
Group B
Group C
Group D
Group E
Group F
Group G
Group H
Group I
Group J
Group K
Group L
Group M
Group N
Group O
Group P
Group Q
Group R
Group S
48
76
79
51
54
23*
27*
39
55
67
80
7 yr Avg Gin Trash (short ton)

Gin Trash v.s. Possible Electricity Output and Revenues at Peak Load Time			
Variable	Group M (Lubbock)	Group J (Hale)	Group Q (Crosby)
Gin Trash	thousand tons		
Mean	61.26	54.91	29.94
Median	64.34	57.66	31.44
Mode	67.89	60.85	33.18
Std Dev	15.19	13.61	7.42
Skewness	-0.8337	-0.8337	-0.8337
Max	83.26	74.63	40.69
Min	9.45	8.47	4.62
Output Distribution	Electricity Output (thousand MW)		
Quantile of 1%	8.41	7.54	4.11
Quantile of 5%	30.78	27.59	15.04
Quantile of 10%	36.69	32.88	17.93
Quantile of 25%	46.01	41.24	22.48
Quantile of 50%	57.31	51.37	28.00
Quantile of 75%	64.71	58.00	31.62
Quantile of 90%	70.93	63.57	34.66
Quantile of 95%	71.83	64.38	35.10
Quantile of 99%	74.17	66.47	36.24
Electricity output at Mean (MW)	54568.69	48908.98	26665.57
MWh/Peak Load Hour	77.96	69.87	38.09
Gas Turbine Capacity (MW)	**40**	**25**	**10**
Cost at 15yr depreciation (1000$/yr)	2269.93	1638.40	684.8
Revenue (1000 $/yr)	2344.22	1835.22	911.64
Unit Cost ($/Mwe)	41.60	33.50	25.68

Notes: 29.0% Electrical efficiency used for electricity output.
700 Peak Load hours used for MWh/Peak Load Hour.
Electricitly price is 60 $/Mwe at Peak Load Time, 25 $/Mwe at regular price.
13.10 mmBtu/ton used for Btu content of gin trash (UGA).
Gin trash is collected in 10 miles radius.



10 20 30 40 50 60 70

Lubbock

MWe

29% Efficiency

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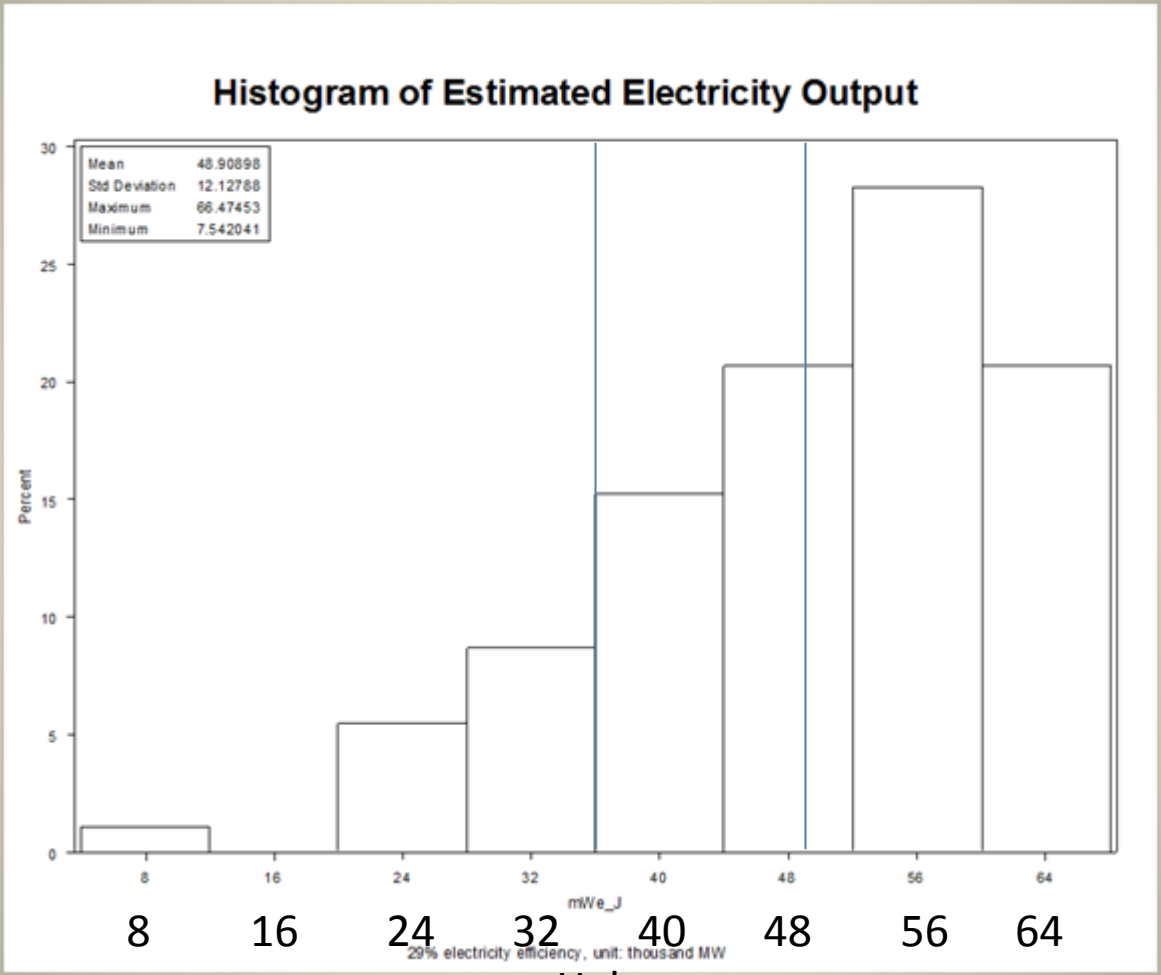

8 16 24 32 40 48 56 64

Hale

MWe

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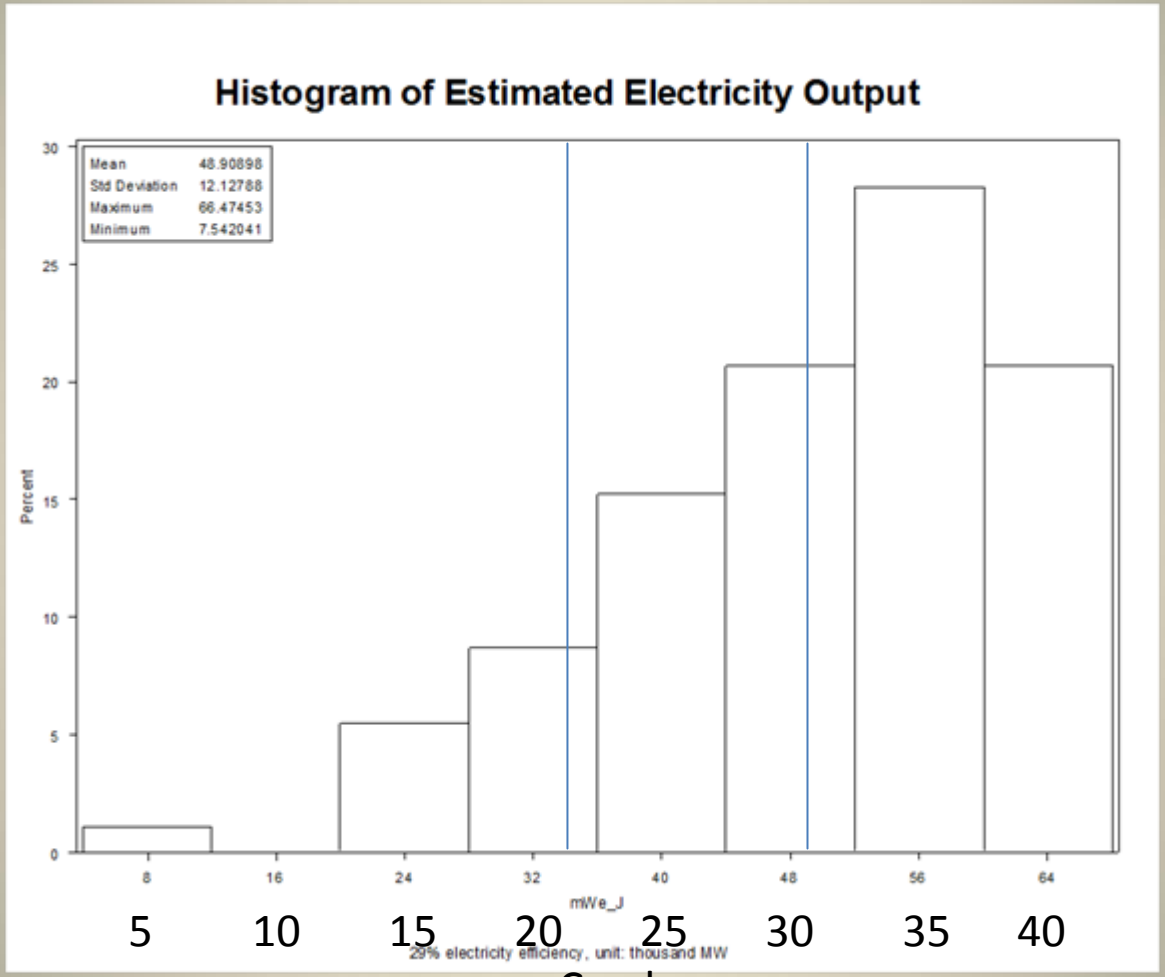

5 10 15 20 25 30 35 40

Crosby
MWe
29% Efficiency

Conclusion

- New Energy Rules Very Expensive
- New Energy Alternatives Vague
- Attempt Value Added Streams in Co-ops to balance portfolio and increase income
- Requires Creativity