



Municipal Utility Applications

Wood-to-Energy:
Iowa Wood By-Products Workshop

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Municipal Utilities in Iowa

- 136 electric municipal utilities in Iowa
- Current situation
 - 56 have no generation of their own, buy all of their electricity
 - Approximately 70 own peaking generation only (diesel generators, etc.)
 - Approximately 10 generate a substantial portion of their electric needs themselves



Power Supply – Then

- Plenty of excess baseload generation
- Low energy prices (coal, natural gas)
- Low wholesale prices
- Most economical for many munis to buy their electricity
- Long-term power supply agreements with low prices



Power Supply - Now

- Not much excess electric generation available
- Transmission constraints
- Higher energy prices (natural gas, coal)
- Much higher, volatile wholesale prices, shorter power supply agreements



Current Wholesale Prices

- Recent IAMU survey
 - Power supply contracts 4.7-6.1 cents per kWh (excluding transmission costs)
 - Previously contracts 2.0-3.5 cents per kWh (excluding transmission costs)
- Transmission can be expensive as well
- Significant price increases!



Preparing for Future

- Many munis are looking into owning more generation
 - Greater price control
 - Lower transmission costs



Baseload Generating Options

- Coal
 - Has been cheapest, but price has been going up as well (delivery of coal)
 - Future greenhouse gas regulations?
 - Out-of-state resource
- Biomass
 - Combined Heat and Power (efficiency)
 - Renewable energy mandates?
 - In-state resource; economic development benefits



Biomass at Cedar Falls Utilities

- Old 16 MW stoker boiler
 - Now only used for peaking generation
 - Too expensive to upgrade if continue burning coal
- Looking into using biomass
 - Testing cubed corn stalks, switchgrass and oat hulls



Cedar Falls Utilities (continued)

- 16 MW unit could produce nearly 25% of CFU's electric load
- Estimated need of biomass fuel is 100,000 tons per year



Wood & Electric Utilities: Laurentian Energy Authority, MN

- Joint venture of Hibbing and Virginia municipal utilities
- 35 MW total capacity of wood powered generation
- Converting existing coal fired boilers
- In operation by 12/31/06



Wood & Electric Utilities: Laurentian Energy Authority, MN

- Opportunity: Xcel Energy's mandate to produce 110 MW of biomass-based electricity
- Xcel buying electricity with a 20-year power purchase agreement at average sale price of 10.2 cents/kWh
- Hibbing & Virginia continue to utilize heat to serve their steam customers



Wood & Electric Utilities: Laurentian Energy Authority, MN

- Economic impact
 - Creates 60-100 new jobs
 - \$704 million gross revenues for the two utilities over 20 years
 - 20 million annual community economic value (labor, fuel, materials). Multiplier of 3 over 20 years equals \$1.2 billion economic value.



Wood & Electric Utilities: St. Paul Cogeneration LLC, MN

- CHP plant close to downtown St. Paul
- Powered by wood waste
- 25 MW electric capacity; sold to Xcel Energy
- Heat sold to District Energy St. Paul (customer-owned utility providing heating and cooling in downtown St. Paul)



Wood & Electric Utilities: Other projects

- Phillips Community Energy Cooperative in south Minneapolis
 - Studying feasibility of turning a garbage transfer station into a biomass-fired power plant that would burn urban waste wood
- Kaua'i Island Utility Cooperative, HI
 - Developing a 7.5 MW biomass-to-energy facility powered by wood chips



Conclusion

- Munis looking at owning more generation
- Greenhouse gas restrictions and/or renewable mandates a real possibility
- Biomass one of the few renewable options for baseload generation
- Projects more likely feasible when both electricity and heat can be utilized



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