

STAFF REPORT

ANALYSIS OF POWER SUPPLY ALTERNATIVES

June 10, 2008

Following the initial presentation of the Power Supply Study prepared by Burns & McDonnell, staff has begun to analyze various future options for the electric utility.

The challenge before us is to determine how we can best meet our future energy and capacity needs. The current capacity of our power plant totals 153 MWs. Given that Unit #7 is over 41 years old, the first question is how to best maintain this base load capacity.

Current estimates reflect the need for an additional 25 MWs of capacity over the next 17 years (2025). Therefore, the second question is how to best satisfy this future growth in demand for electricity.

Attached is a list of options, estimated costs, and the pros and cons associated with each alternative for meeting our projected energy and capacity demands. The first page lists options to maintain the existing 153 MW of capacity. The remaining pages list options to cover future growth.

Option Discussion – to meet current requirements (Keeping Unit 8, How do we meet our existing requirements?)			
Option/Activity	Cost (20 years)	Pro	Con
<p>Purchase 40 MW Ownership from Sutherland 4 Unit – the project is more commonly called the Marshalltown Project. Alliant Energy is leading a group of utilities to build a new 650 MW coal-fired. Estimated in-service date is 2013.</p>	<p>Estimated to be \$2,850 per KW capital cost or \$114,000,000 plus interest . . . energy costs \$0.02 per kWh or \$126,144,000</p> <p>(Have not included possible transmission costs.)</p>	<ul style="list-style-type: none"> o 25% more efficient than Ames' existing generation o New plant o Lower operating cost o Reduced NOx, SO2, Hg, CO2 o Increase generation reliability due to separate power sources, separate coal contract/delivery o Energy prices relatively low and fairly stable 	<ul style="list-style-type: none"> o Obligation to pay entire capital up front before 1 kWh is produced o Risk that plant will not get permitted/built o Contract signing required within 30 days o Deliverability study will not be completed for over a year. <ul style="list-style-type: none"> o May not have firm delivery o May require additional transmission investment o Earliest on-line 2013 o Large rate increases to meet up front capital demands (\$14,000,000 needed in first 5 years) o Plant not under COA control o Only covers existing, still need additional 25 MW
<p>Power Purchase Agreement for 40 MW from Sutherland 4 Unit – (see above)</p>	<p>Estimated Demand Cost \$20/KW-month or \$192,000,000 over 20 years . . . energy costs \$0.02 per kWh or \$126,144,000</p> <p>(Have not included possible transmission costs.)</p>	<ul style="list-style-type: none"> o (same as all above) o Risk removed if plant is not built o No up front cash needs 	<ul style="list-style-type: none"> o Long lead time for plant could leave us 4 years behind on capacity solution if plant ends up not getting built o Will cost more in the long run than ownership, and yet will have less to show for it when term of agreement is done o Deliverability study will not be completed for over a year. <ul style="list-style-type: none"> o May not have firm delivery o May require additional transmission investment o Earliest on-line 2013 o Plant not under COA control o Only covers existing, still need additional 25 MW o Contract signing required within 90 days
<p>Unit #7 Maintenance</p>	<p>Cost: < \$5,000,000 . . . energy costs \$0.035 per kWh or \$220,752,000</p>	<ul style="list-style-type: none"> o Relatively low cost 	<ul style="list-style-type: none"> o May need to meet future EPA guidelines o Does not provide any new capacity o Fuel delivery and storage costs higher than options above o Little/no life left after 20 years

**Option Discussion – to meet future requirements
Supply Side**

<p>Ownership 10-20 MW from Sutherland 4 – (see above)</p>	<p>Keep unit 8, and 40 MW from either unit 7 or Sutherland purchase</p>	<p>Estimated to be \$2,850 per KW capital cost or \$28,500,000 - \$57,000,000 plus interest energy costs \$0.02 per kWh or \$31,536,000 – \$63,072,000</p>	<ul style="list-style-type: none"> o (same as above Sutherland options on page 1) o Not all eggs-in-one basket o Reduced rate shock o Accommodates future capacity needs o Mitigates/improves some coal delivery and coal costs. 	<ul style="list-style-type: none"> o (same as above Sutherland options on page 1)
<p>Power Purchase Agreement 10-20 MW from Sutherland 4 – (see above)</p>	<p>Est. Demand Cost \$20/kW, or \$48,000,000 to \$96,000,000 energy costs \$0.02 per kWh or \$31,536,000 – \$63,072,000</p>	<ul style="list-style-type: none"> o (same as above Sutherland options on page 1) o Not all eggs-in-one basket o Reduced rate shock o Accommodates future capacity needs o Mitigates/improves some coal delivery and coal costs. 	<ul style="list-style-type: none"> o (same as above Sutherland options on page 1) 	<ul style="list-style-type: none"> o (same as above Sutherland options on page 1)
<p>Install/Purchase 25 MW Combustion Turbine generation –</p>	<p>Estimated to be \$1,000 per KW capital cost or \$25,000,000 plus interest energy costs (mkt purchase) \$0.059 per kWh or \$129,210,000</p>	<ul style="list-style-type: none"> o Lower cost method to meet capacity needs o COA control o Backstop for weak transmission system o More environmentally acceptable than coal o May be designed to burn alternative fuels (renewable) 	<ul style="list-style-type: none"> o Sighting/permitting required o Higher energy costs, plan to run very little o Energy prices volatile o May require routing of new gas line o Still has some CO2 footprint o “front loading” of capital investment o Capacity installed in one piece 	<ul style="list-style-type: none"> o New Source Review Requirements – o Permitting uncertainty o Same coal issues
<p>Unit # 7 Repower – Replace existing boiler with “high pressure” add front end turbine</p>	<p>Cost: Estimated \$50,000,000 plus interest energy costs \$0.03 per kWh or \$47,304,000</p>	<ul style="list-style-type: none"> o Gain approx. 15 MW to meet future capacity needs o Enhance value of existing generation o New boiler 	<ul style="list-style-type: none"> o Simple & straight forward 	<ul style="list-style-type: none"> o Sellers market, may not be available or too costly o Typically longer the term the higher the price o Difficult to get a fixed price
<p>Use Capacity/Energy Market – Perform a Request for Proposal to sign long term contract for capacity and/or energy</p>	<p>Cost: TBD</p>	<ul style="list-style-type: none"> o Simple & straight forward 	<ul style="list-style-type: none"> o Sellers market, may not be available or too costly o Typically longer the term the higher the price o Difficult to get a fixed price 	<ul style="list-style-type: none"> o Sellers market, may not be available or too costly o Typically longer the term the higher the price o Difficult to get a fixed price