Council/EUORAB Workshop

Energy Resource Options Study
15 October, 2013

Presentation Outline

1. Welcome, Introduction of EUORAB members
2. Background
    a. Meeting the Capacity/Energy Needs (High level review)
        i. Existing power plants
        ii. EPA rules and proposed rules
        iii. Price and Availability of Natural Gas
        iv. Developed 16 alternatives – combinations of coal, natural gas, and retire
    b. Refuse Derived Fuel (RDF)
        i. Studied with and without
    c. Hired Black & Veatch
        i. Reduced to 2 options – Remain on Coal, Convert to Natural Gas
    d. Findings from the Study
        i. With or without RDF does not change the fuel source decision
        ii. Analysis going forward assumes that RDF will continue to be burned in the plant.
3. Staff Decision Analysis
    a. Requirements to stay on Coal
        i. Dry Sorbent Injection, Powder Activated Carbon, Fabric Filter baghouse
    b. Requirements to convert to Natural Gas
        i. Natural Gas line, new burners, plant improvements
    c. Social, Environmental, Regulatory, Physical and Political Considerations –
    Attachment “Coal vs Gas Comparison"
    d. Timetable (consideration of EPA deadlines) -
    Attachment “Compliance Timeline”
    e. Cost Impact to Rate payers –
    Attachment “System Cost Impact Graph”
    Attachment “Rate Impact Graph”
        i. Discuss Council approved change order w/ Black & Veatch
    f. Staff Recommendation
        i. Pros & Cons –
        Attachment “Pros & Cons”
        ii. Recommend convert to Natural Gas
4. Next Steps
    a. Public meetings on Oct 28 & 30
    b. Return to Council on November 12th for approval to move forward
    c. Two Gas delivery options - Build pipeline vs. long term contract with Alliant

Issues: Regulations Permits Political Social	**Status:**	**Case 1:** Units 7 & 8 remain on coal, co-fire refuse derived fuel (RDF), startup on #2 fuel oil Retrofit plant with dry sorbent injection (DSI) with trona for acid gas control, powder activated carbon (PAC) for mercury control, and a fabric filter (FF) bag house for PM_F control	**Case 2:** Fuel switch Units 7 & 8 from coal to natural gas, co-fire refuse derived fuel (RDF), startup on natural gas
Title V Operating Permit	Existing Rule.	Permit would have to be modified and re-issued to reflect the modifications to the power plant and the changes in pollution control equipment. During the public notice period, 3rd party interveners likely to object. Annual air emissions inventory process more difficult and complex. Significantly more (and more complex) stack testing required.	Permit would have to be modified and re-issued to reflect the modifications to the power plant associated with converting from coal to natural gas. During the mandatory public notice period, 3rd party interveners unlikely to object. The annual air emissions inventory process and stack testing requirements would be less (than current requirements).
CSAPR (Cross State Air Pollution Rule)	Final rule challenged and now before the U.S. Supreme Court awaiting oral argument and decision. (Oral argument currently scheduled for December 20, 2013.)	Both SO_2 and NOx compliance issues.	No SO_2 compliance issues. Possible NO_X compliance issues.

MATS (Mercury and Air Toxics Standard)	Rule finalized 02/16/2012. Standard compliance required April 2015. One (1) year extension available to April 2016. Possible, but unlikely compliance extension to April 2017.	Must install dry sorbent injection (DSI) system(s) to control acid gas emissions, powder activated carbon (PAC) system(s) to control mercury emissions, and a fabric filter bag house(s) to control particulate matter (PM) emissions.	Rule does not apply to NG units.
CCR (Coal Combustion Residuals)	Proposed rule published in *Federal Register* 06/21/2010. Highly politicized and controversial rule.	The existing surface impoundment for receiving ash would have to be excavated to remove CCR solids and then lined, or the site would have to be phased out and closed – likely within (5) years of the issuance of the final rule..	The rule does not apply to NG units. However, the existing surface impoundment would have to phased out and closed – likely within (5) years of the issuance of the final rule.
NPDES (National Pollutant Discharge Elimination System)	Existing Rule	Coal pile runoff and cooling tower blowdown would be regulated as it is now.	Cooling tower blowdown would be regulated as it is now.
ELG (Effluent Limitations Guidelines)	Proposed rule published 06/07/2013. Comment period closed 09/20/2013.	Rule could force major equipment modifications. Flyash from the FF bag house (with trona captured acids and carbon captured mercury) likely to be handled dry or dewatered for zero discharge. Non-chemical metal cleaning wastes, such as wash water from ash removal from tubes, ducts, and heat exchanger elements, could be subject to copper and iron limits.	Rule could require dry handling of (RDF) ash or zero discharge dewatering. Non-chemical metal cleaning wastes, such as wash water from ash removal from tubes, ducts, and heat exchanger elements, could be subject to copper and iron limits.

SSM (Startup, Shutdown, and Malfunction)	Proposed rule published. Waiting for issuance of final rule.	Would likely require Unit 7 & 8 be retrofitted to be able to light-off and startup the boiler with natural gas.	Possible minor issue relating to NOx
BACT (Best Available Control Technology)		Air quality control equipment contemplated for compliance with other rules still not BACT for SO2 and NOx.	Possible risk for NOx.
NAAQS (National Ambient Air Quality Standard	Existing rule	No issues that would impact expected operations.	No issues that would impact expected operations.
PSD-NSR (Prevention of Significant Deterioration-New Source Review) – Construction Permitting from Iowa DNR	Existing rule.	Permit(s) required for modifying the power plant related to the installation of three systems (DSI, PAC, and FF bag house). Detailed and complex analyses will be required to justify the case. Expect a long lead time to receive permit(s) from Iowa DNR. At risk for 3rd party intervention during mandatory public comment period.	Permit(s) required for modifying and converting the power plant from coal to natural gas. Analyses required by Iowa DNR should be minimal. Permit lead time should be normal.

NSPS (New Source Performance Standard)	Existing rule.	NSPS exclusion applies so long as the modifications cost less than 50% of the reconstruction costs. (Pollution controls are excluded from the calculation of the reconstruction costs.)	Unit 7 was originally designed to burn natural gas as a fuel (prior to 1971), so it is excluded. For Unit 8, NSPS exclusion applies so long as the modifications cost less than 50% of the reconstruction costs. (Pollution controls are excluded from the calculation of the reconstruction costs.)
GHG (Greenhouse Gas Regulations – CO2e)	Proposed regulations currently being written by EPA	83% greater GHG emissions as compared to natural gas. Proposed regulations regarding CO2 expected to be very challenging for existing coal-fired power plants. (Proposed rule expected June 2014.)	Significantly less GHG emissions as compared to coal.
Construction Permitting – Non Power Plant		None	None if tariff for natural gas can be reached with Alliant Energy. If COA determines to build its own supply line to serve the power plant, Iowa Utilities Board (IUB) franchise approval required, along with easement agreements with landowners along the route.

3rd Party Intervention		Llkely. MEC and Alliant Energy already have signed consent decrees with a 3rd party environmental group.	Possible, but not likely.
Fuel Delivery		Customers served by the Alliant Energy-Williams Bulk Transfer facility in Williams, Iowa is shrinking. Alliant Energy's interest in operating the facility long-term is unknown. The captive customer price of a future contract for delivery of coal would be expected to escalate significantly. (The transition from our prior contract to the current contract, which commenced 1/1/2010, caused an immediate increase in the delivery charge of 50%.)	Presently, the natural gas infrastructure at or close to the power plant cannot support the requirements of the City of Ames Steam Electric Plant (Units 7 & 8). There are two options to supply natural gas to the power plant: a) negotiate with Alliant Energy for a long-term (10 years minimum) custom tariff rate to supply natural gas to the power plant which would include necessary infrastructure enhancements. b) tap the interstate high pressure natural gas pipeline near Story City and construct our own pipeline to serve the power plant in Ames.

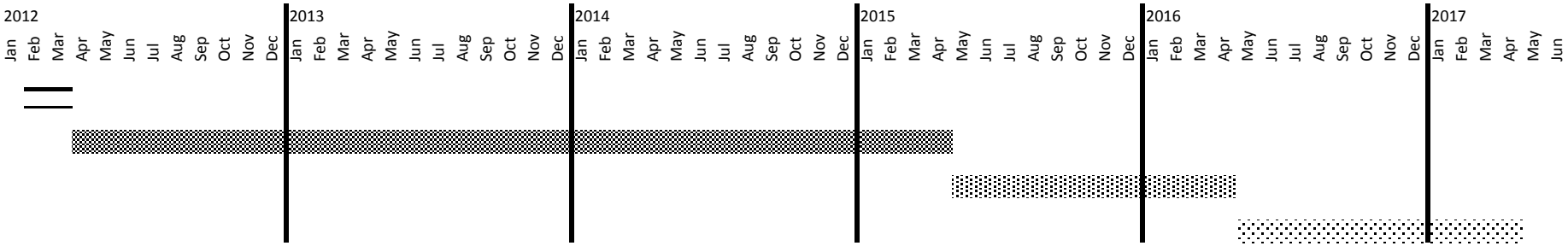
Ash Disposal		Significant ash disposal issues and costs due to PM volume, plus collection of flyash with mercury and acids.	Some issues with disposing of RDF ash.
RDF Burning		No change in volume compared to current usage	13% reduction in amount of RDF the boilers would be able to consume compared to current usage. (Must retain capability to burn coal to remain as EGU, and not be regulated as CISWI unit.)
Employee Impact		Probable increase of full time equivalent (FTE) employees.	Probable decrease of full time equivalent (FTE) employees.
Political Acceptance – Public Support		Likely controversial due to the current political discourse regarding using coal as a power plant fuel.	Likely favorable

Engineering – Degree of Difficulty		Difficult due to the limited available space (footprint) to place equipment.	Routing of gas piping inside the power plant will be difficult in order to avoid interferences with existing structures and equipment. If COA determines that building its own natural gas pipeline is the best option to serve the power plant with natural gas, engineering of (2) gas gates and 14 miles of pipeline will be time consuming to select the route, acquire easements, design the pipeline and the gates, and apply for and acquire permitting.
Construction – Degree of Difficulty		Difficult construction due to very restricted access for cranes and other similar equipment. Cannot lift over or enter the right-of-way corridor of the Union Pacific RR.	Construction inside the power plant will be challenging to route gas piping and other equipment to avoid interfering with existing equipment and structures. If necessary, construction of the 14 mile pipeline and (2) gas gates could be challenging due to the impact of weather, RR and road crossings, land easement issues, etc..

City of Ames, Iowa

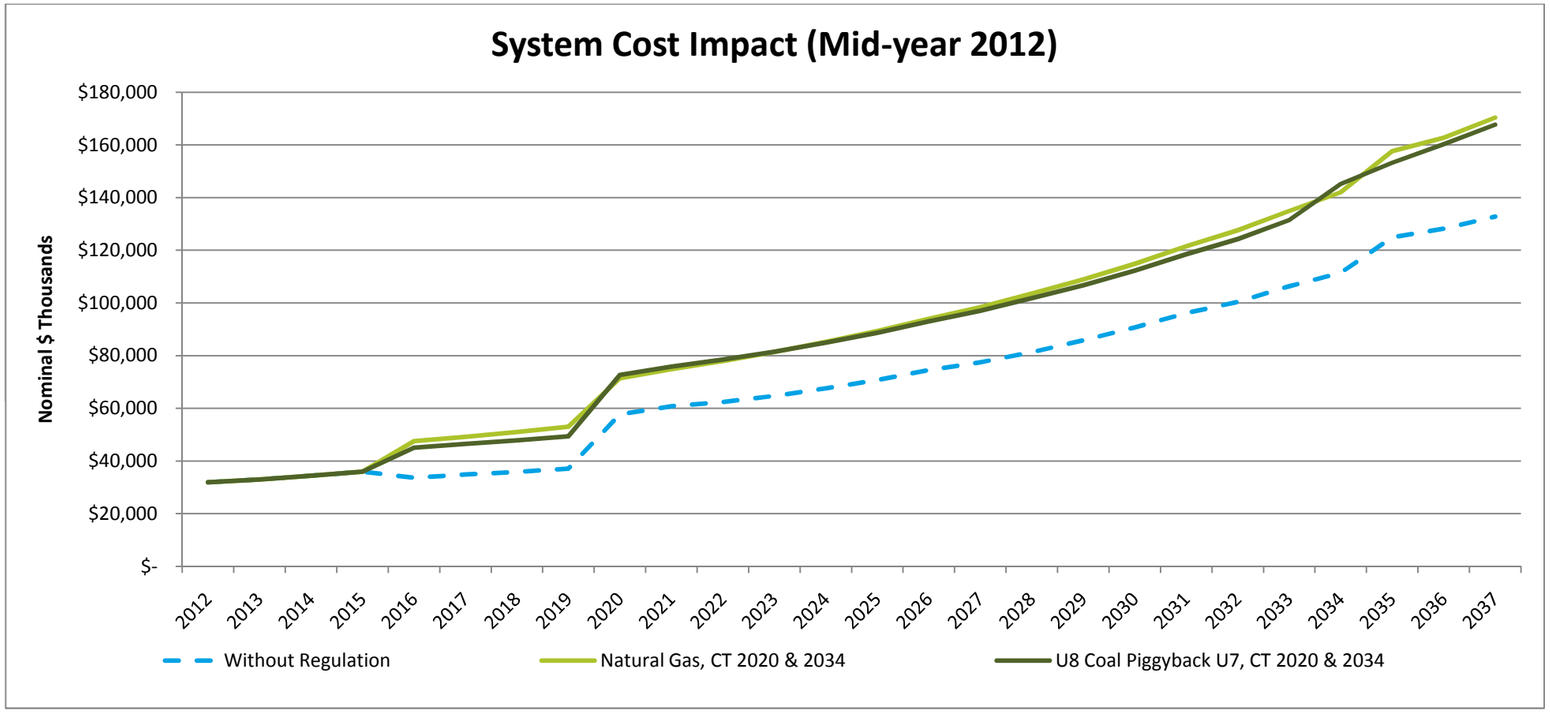
Compliance Tiimeline -- Mercury and Air Toxics Standard (MATS)

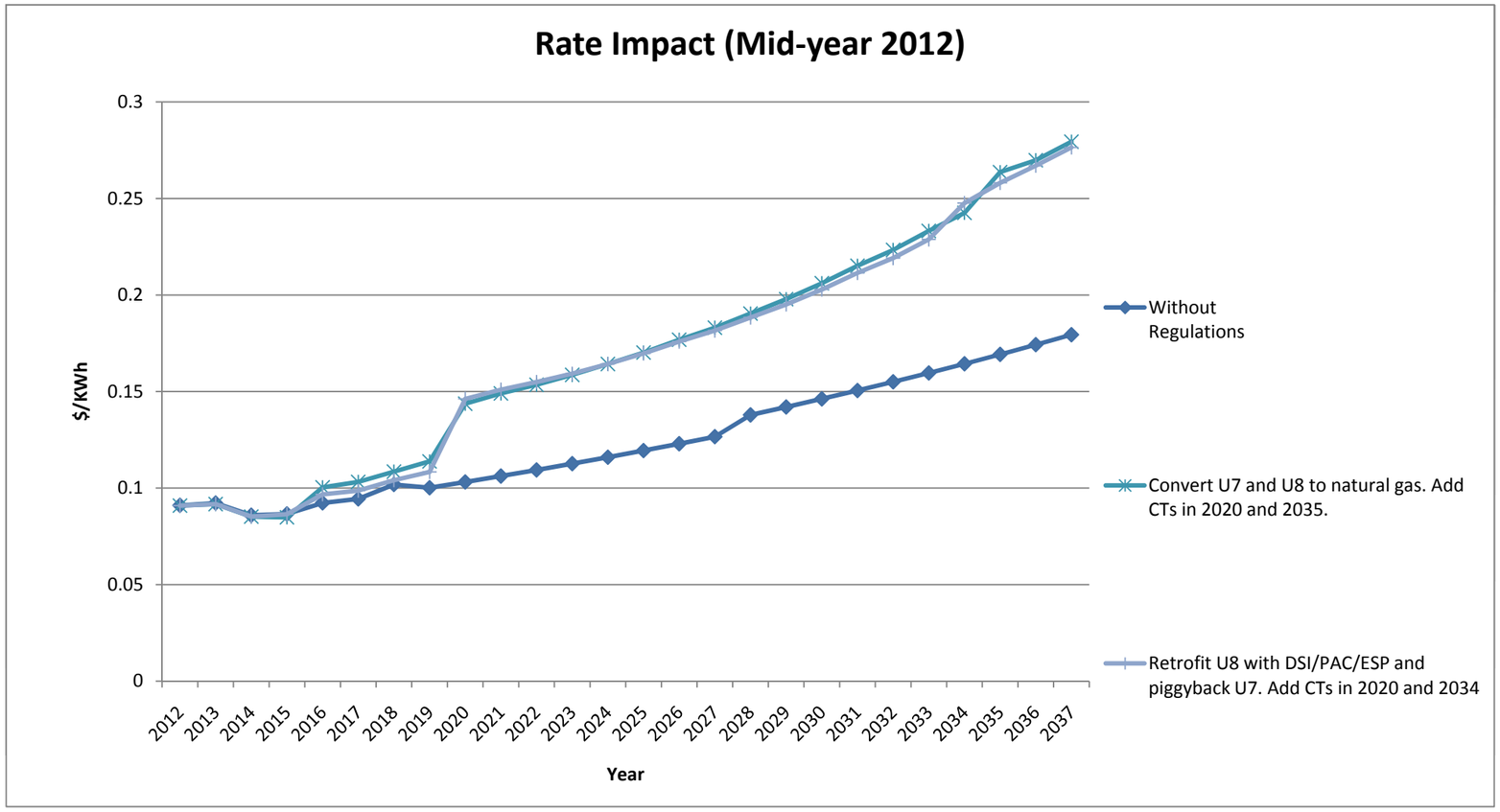
Steam Electric Plant (SEP) -- Units 7 & 8



LEGEND:

- Sixty (60) day delay in the start of the compliance period following publication of the final rule in the *Federal Register* (February 16, 2012)
- Three (3) year compliance period
- One (1) year extension -- EPA very likely to grant
- One (1) year extension based on regional transmission reliabilty needs - EPA very unlikely to grant


System Cost Impact (Mid-year 2012)
Nominal $ Thousands
$180,000
$160,000
$140,000
$120,000
$100,000
$80,000
$60,000
$40,000
$20,000
$-
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
Without Regulation
Natural Gas, CT 2020 & 2034
U8 Coal Piggyback U7, CT 2020 & 2034


Rate Impact (Mid-year 2012)
$/KWh
0.3
0.25
0.2
0.15
0.1
0.05
0
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
Year
Without Regulations
Convert U7 and U8 to natural gas. Add CTs in 2020 and 2035.
Retrofit U8 with DSI/PAC/ESP and piggyback U7. Add CTs in 2020 and 2034

Natural Gas vs. Coal

NATURAL GAS

Pros	Cons

• Regional gas is "plentiful"
• Meets all known EPA environmental limits
• Publicly more acceptable than coal
• Minimal plant modification
• Coal dust eliminated
	• Reduction in RDF burn capability (down 13%)
	• Sufficient gas delivery not available within Ames.
	• Will need major pipeline construction project in/around power plant
	  ○ Build own pipe – large capital cost
	  ○ Contract with Alliant – long term commitment
	• No real fuel diversification between COA plant and the energy market
	• Gas commodity price fluctuations (summer vs. winter)
	• Pres. Obama *"Natural Gas is an intermediate solution"*

COAL

Pros	Cons
• No change in ability to burn RDF • Provides an alternative fuel type to natural gas (gas will predominately set the market energy price.) • Stable coal price • No construction needed off plant site	• Limited delivery options; captive to rail and unloading facility. Delivery cost increases • Appears public sentiment is increasingly against coal • Considerably more EPA rules to meet • Challenging permitting process • Will need considerable equipment installed at plant site • Coal-fired plant produces 83% more CO_2 than gas-fired plants. Pres. Obama *"40% of CO_2 comes from power plants. It's not right. It's not safe. It needs to stop."*

October/November 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
13	14	15 City Council/ EUORAB Joint Workshop 7:00 p.m.	16	17	18	19
20	21	22	23	24	25	26
27	28 Public Input Council Chambers 7:00 p.m.	29	30 Public Input Scheman Bldg 3:00 p.m.	31	1	2
3	4	5	6	7	8	9
10	11	12 City Council Meeting	13	14	15	16