Significant Air Environmental Rule Update

Joint Energy and Environment Policy Committee Meeting

October 17, 2011

Discussion Agenda

- Cross-State Air Pollution Rule (SO2 and NOx)
- Power Plant Mercury and Air Toxics Standards (mercury, metals, acid gases)
- 2010 SO2 National Ambient Air Quality Standard (SO2)

Cross-State Air Pollution Rule - Summary

- The recently finalized Cross-State Air Pollution Rule (CSAPR) requires substantial near-term emission reductions in Missouri and Kansas to address each state's significant contribution to nonattainment and interference with maintenance of the National Ambient Air Quality Standards downwind.

- This final rule includes four air quality-assured trading programs: an annual NOx trading program, an ozone-season NOx trading program, and two separate SO2 trading programs (SO2 Group 1 - Missouri and SO2 Group 2 - Kansas).

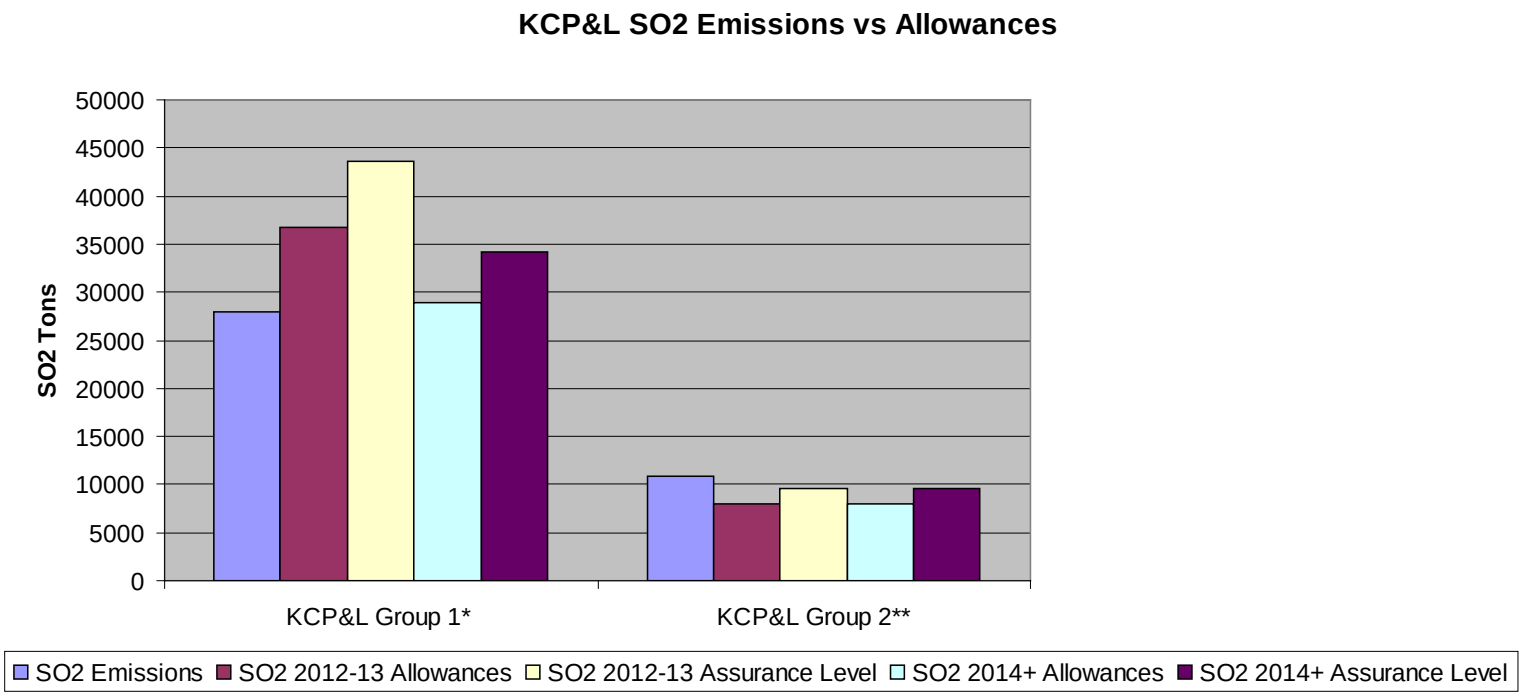
- The first phase of CSAPR compliance commences January 1, 2012 and the second more stringent phase of CSAPR reductions commences January 1, 2014.

- This rule generally only covers electric generating units.

- EPA is promulgating the CSAPR in response to the remand of the Clean Air Interstate Rule (CAIR) by the Court in 2008. CAIR will remain in effect through 2011.

- The CSAPR emission budgets are based on the EPA's state-by-state analysis of each upwind state's significant contribution to nonattainment and interference with maintenance. The CSAPR include assurance provisions specifically designed to ensure that no state's emissions are allowed to exceed that specific state's budget, thus, limits interstate trading.

Cross-State Air Pollution Rule - SO2 Emissions vs. Allowances



* KCP&L and GMO Missouri Units

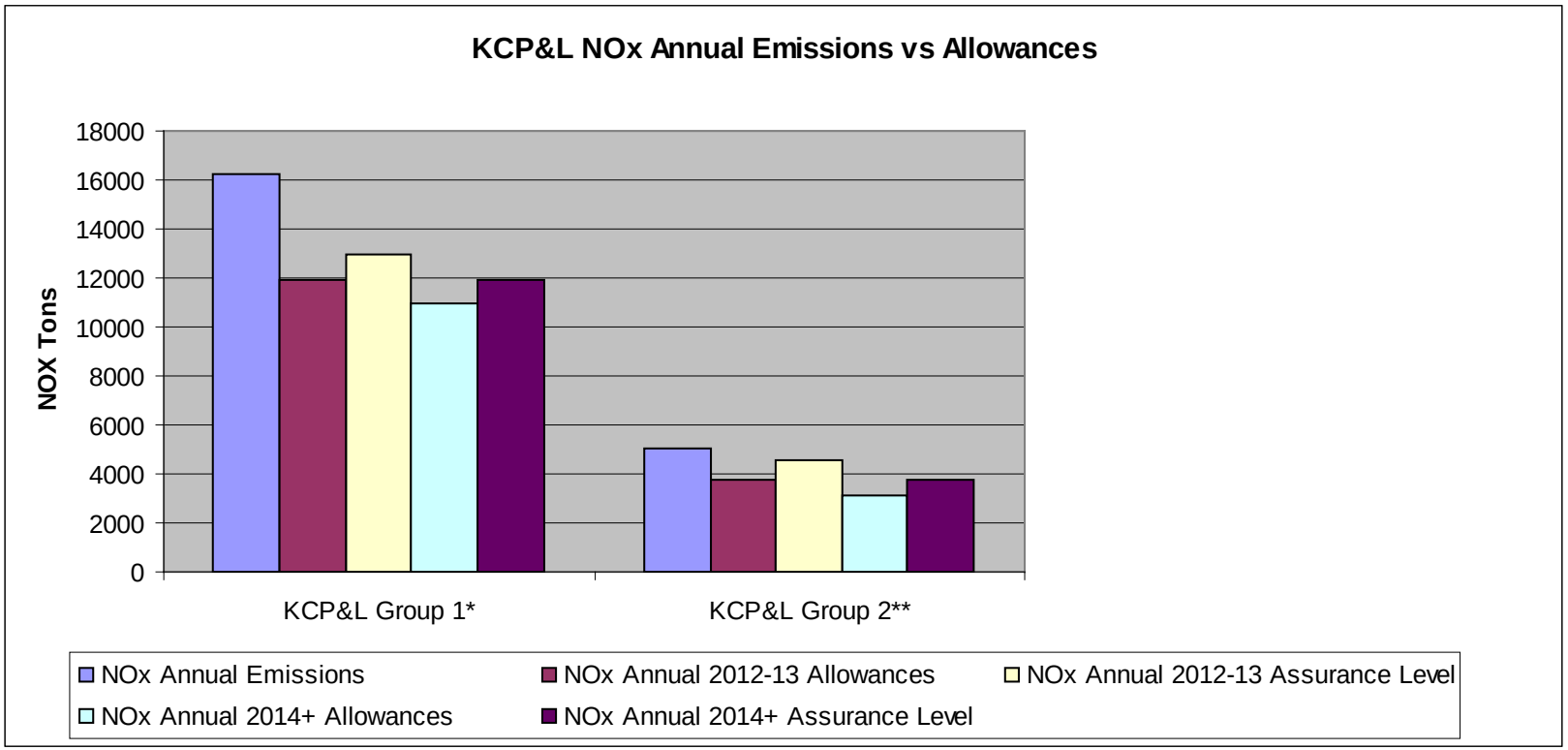
** KCP&L Kansas Units

All values are % share

Sources: Emission data from EPA Clean Air Markets website

Allowance and Assurance level data from EPA CSAPR website and resource materials

Cross-State Air Pollution Rule - NOx Emissions vs. Allowances



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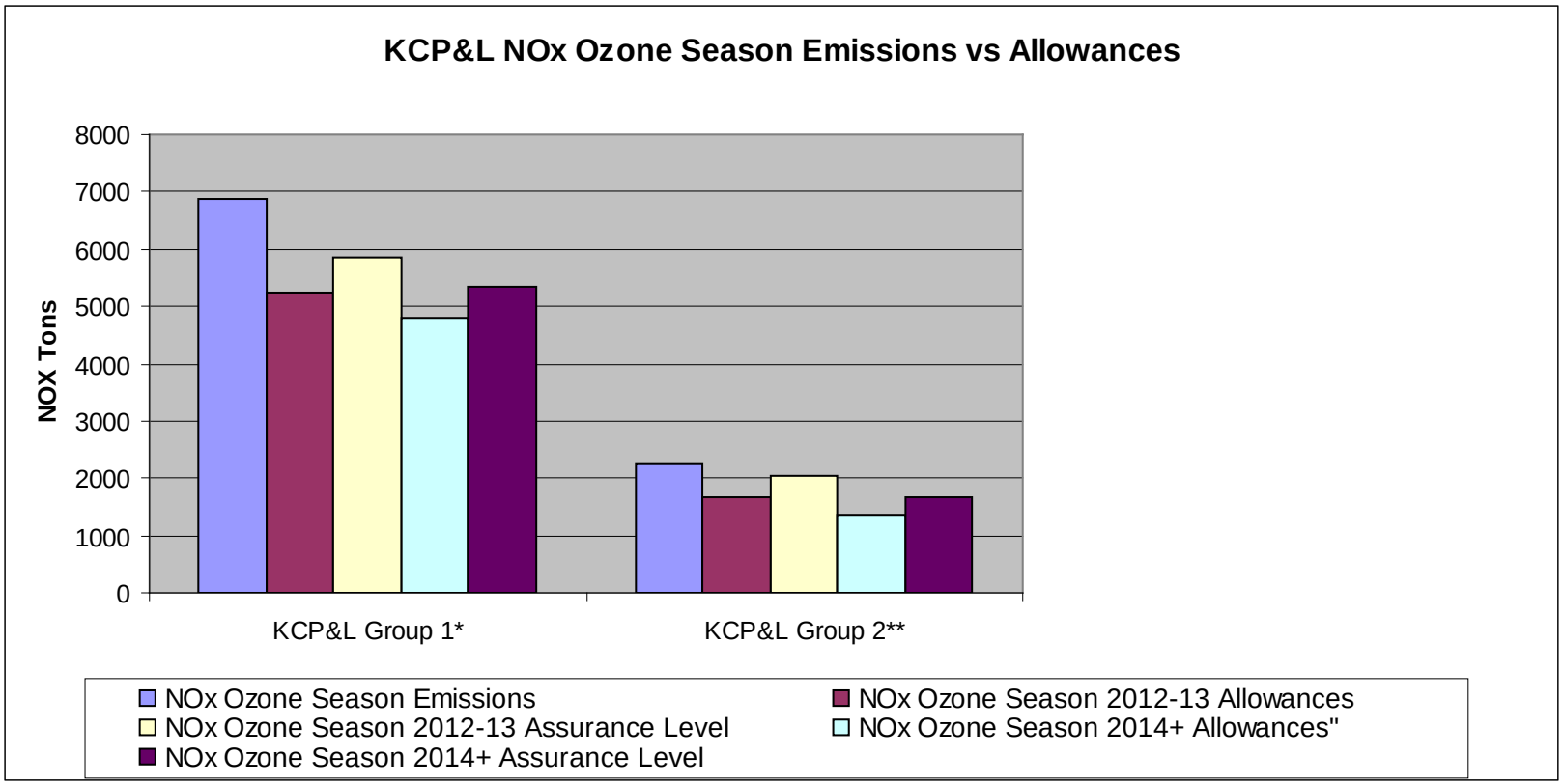
Sources: Emission data from EPA Clean Air Markets website

Allowance and Assurance level data from EPA CSAPR website and resource materials

Cross-State Air Pollution Rule - NOx Ozone Season Emissions vs Allowances



* KCP&L and GMO Missouri Units

** KCP&L Kansas Units

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Sources: Emission data from EPA Clean Air Markets website

Allowance and Assurance level data from EPA CSAPR website and resource materials

Cross-State Air Pollution Rule - Impact on KCP&L Units

Annual SO2 Allowances

Group 1 (Missouri):

KCP&L – Projected to have excess SO2 allowances in 2012 and beyond, so no additional SO2 controls are anticipated for compliance.

KCP&L GMO – Projected to be short SO2 allowances in 2014 and beyond but the shortfall could be covered by KCP&L's excess allowances without installing additional SO2 controls for compliance.

Group 2 (Kansas):

KCP&L – La Cygne Station projected to be short SO2 allowances starting in 2012. KCP&L plans on implementing various options, including but not limited to, reducing annual generation and fuel switching to lower sulfur coal.

Annual and Ozone Season NOx Allowances

Missouri:

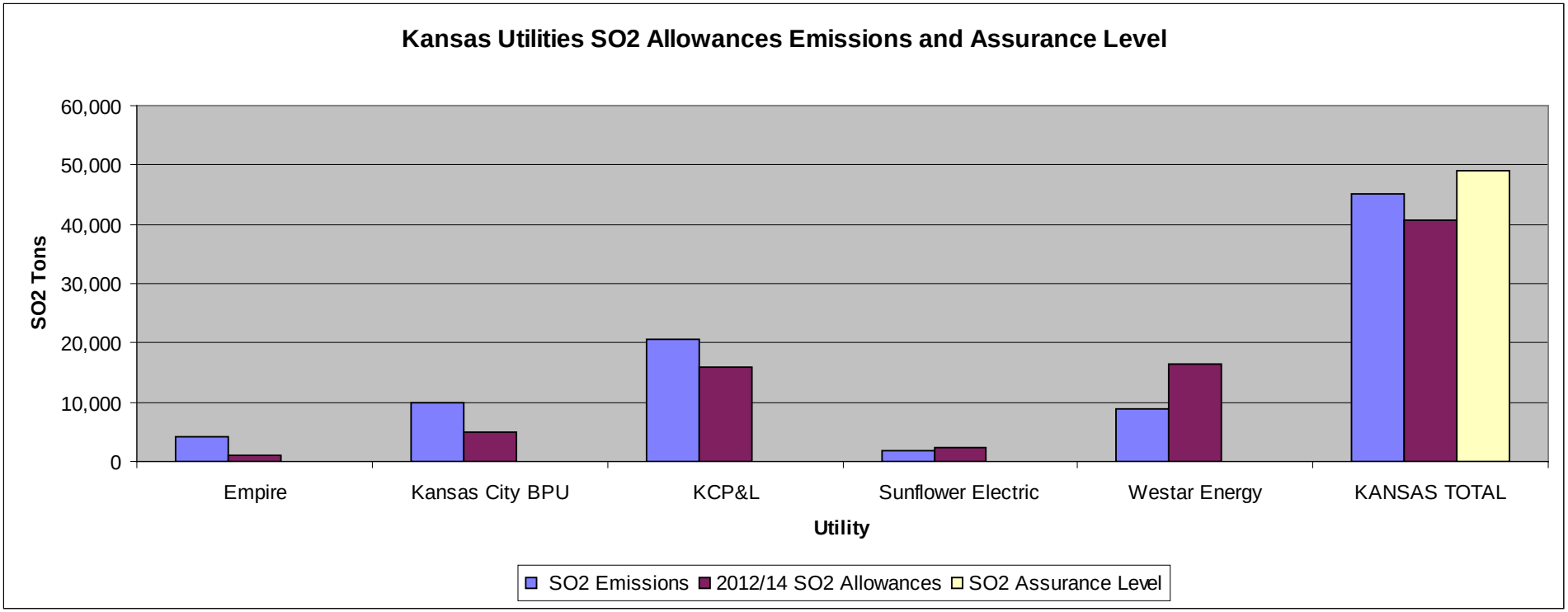
KCP&L – Projected to be short NOx annual allowances starting in 2012. KCP&L plans on implementing various options, including but not limited to, installing low-NOx burners, reducing annual generation and/or getting greater reduction when possible from existing SCRs.

KCP&L GMO – Projected to be short NOx annual allowances starting in 2012. KCP&L plans on implementing various options, including but not limited to, reducing annual generation and/or getting greater reduction when possible from existing SNCRs and SCR.

Kansas:

KCP&L – La Cygne Station is projected to be short NOx allowances starting in 2012. KCP&L plans on implementing various options, including but not limited to, installing low-NOx burners, reducing annual generation and/or getting greater reduction when possible from existing SCR.

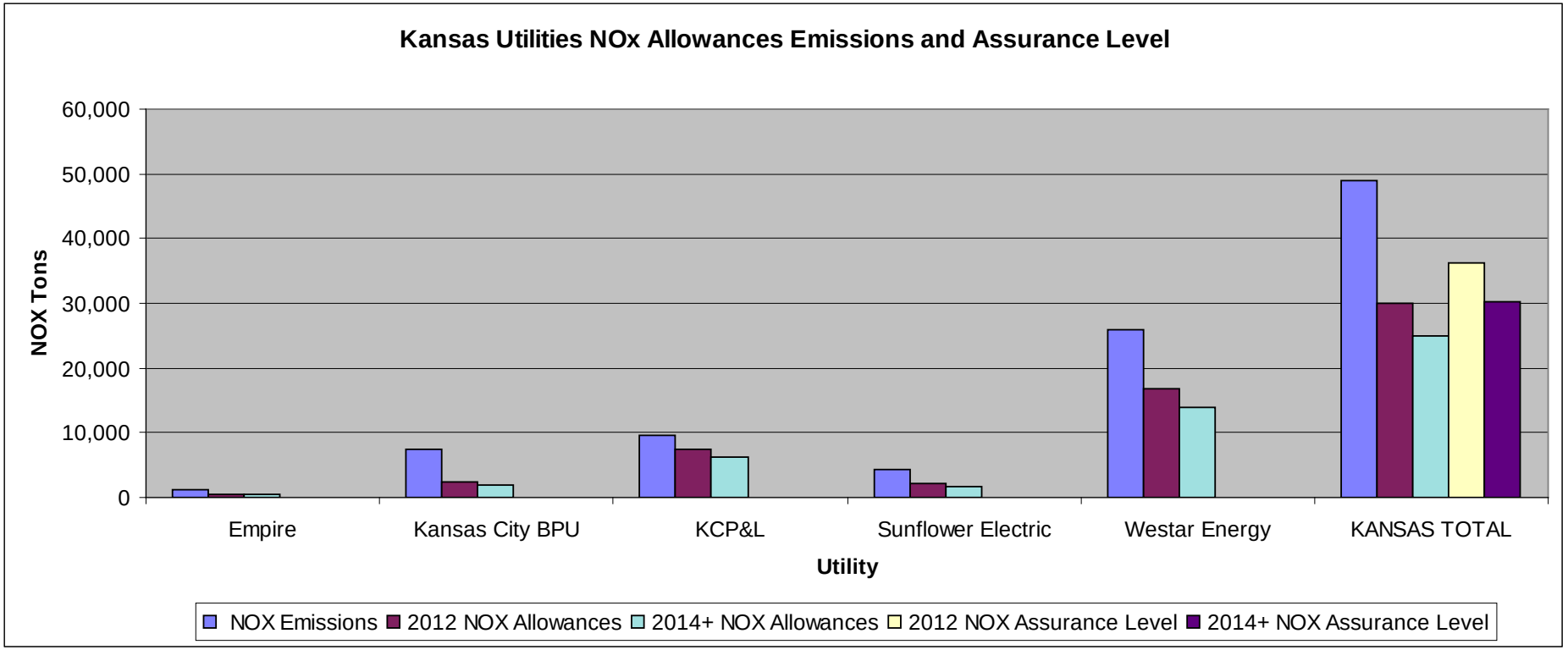
Cross-State Air Pollution Rule – SO2 Emissions and Allowances in Kansas



Sources: Emission data from EPA Clean Air Markets website

Allowance and Assurance level data from EPA CSAPR website and resource materials

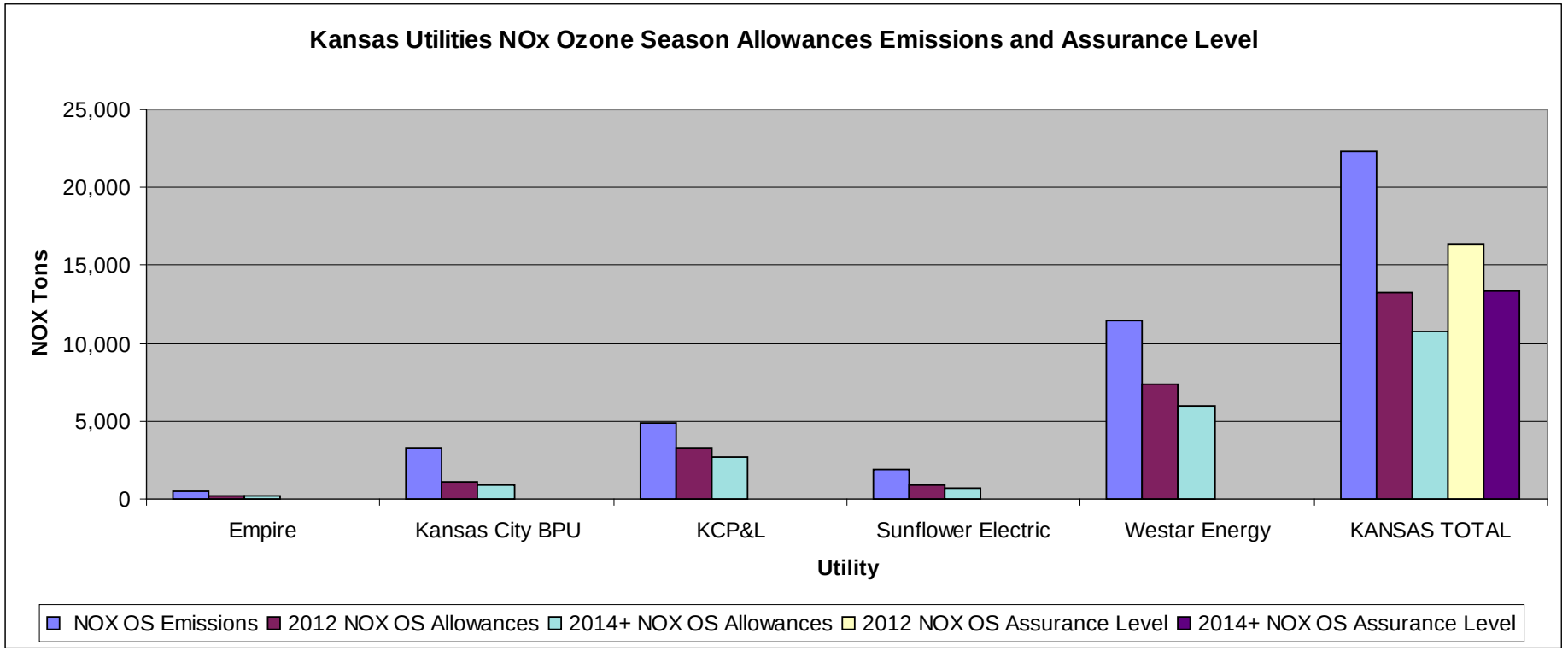
Cross-State Air Pollution Rule – NOx Annual Emissions and Allowances in Kansas



Sources: Emission data from EPA Clean Air Markets website

Allowance and Assurance level data from EPA CSAPR website and resource materials

Cross-State Air Pollution Rule – NOx Season Emissions and Allowances in Kansas



OS=Ozone Season

Sources: Emission data from EPA Clean Air Markets website

Allowance and Assurance level data from EPA CSAPR website and resource materials

Power Plant Mercury and Air Toxics Standards - Summary

- Pursuant to a consent order, EPA issued a proposed a rule on March 16, 2011 and will finalize by November 2011.

- Existing sources have up to three years to comply, with a one year extension possible if technology cannot be installed in time and granted by the state.

- Assuming final rule published in January 2012, compliance could be as soon as 2015 or 2016 with one year extension.

- The proposed rule sets numeric limits for mercury, particulate matter (a surrogate for non-mercury metals), and hydrogen chloride (a surrogate for acid gases). It establishes work practices, instead of numerical emission limits, for organics including dioxin/furan.

- EPA is proposing to allow facility-wide averaging for all hazardous air pollutants emissions from existing units.

Power Plant Mercury and Air Toxics Standards - Impact on KCP&L Units

KCP&L Units Minimally Impacted

- Iatan Units 1 and 2 – No additional controls anticipated.
- La Cygne Units 1 and 2 - No additional controls anticipated (assuming completion of Environmental Retrofit Project).
- Hawthorn Unit 5 – mercury control anticipated (activated carbon injection).

KCP&L Units Significantly Impacted

- Montrose Units 1, 2 and 3 - mercury (activated carbon injection), particulate matter control (baghouses), and potentially dry sorbent injection (acid gases) anticipated.
- Sibley Units 1, 2 and 3 - mercury (activated carbon injection), particulate matter control (improved precipitators or baghouses), and potentially dry sorbent injection (acid gases) anticipated.
- Lake Road Boiler 6/Unit 4 - mercury (activated carbon injection), particulate matter control (baghouses), and potentially dry sorbent injection (acid gases) anticipated or fuel conversion to natural gas.

2010 SO2 National Ambient Air Quality Standard - Summary

- On June 2, 2010, EPA finalized a new primary National Ambient Air Quality Standard for SO2. EPA established a new 1-hour standard at a level of 75 parts per billion.

- In July 2011, the MDNR recommended to the EPA part of Jackson County, Missouri be designated a nonattainment area for the new 1-hour SO2 standard. All other counties in the Kansas City area were designated unclassifiable by MDNR and KDHE requiring further modeling and monitoring to designate.

- EPA to finalize designations by June 2012.

- KDHE and MDNR will complete refined modeling to determine sources impacting standard that will need additional SO2 controls. States with areas designated nonattainment in 2012 would need to submit state implementation plans (SIPs) to EPA by June 2014 outlining additional controls that will to be added to meet the standards as expeditiously as possible, but no later than August 2017.

2010 SO2 National Ambient Air Quality Standard - Impact on KCP&L Units

KCP&L Units Minimally Impacted

- Iatan Units 1 and 2 – No additional controls anticipated.
- La Cygne Units 1 and 2 - No additional controls anticipated (assuming completion of Environmental Retrofit Project).
- Hawthorn Unit 5 – No additional controls anticipated.

KCP&L Units Significantly Impacted

- Montrose Units 1, 2 and 3 – scrubbers or other SO2 controls with baghouses anticipated.
- Sibley Units 1, 2 and 3 - scrubbers or other SO2 controls with baghouses anticipated.
- Lake Road Boiler 6/Unit 4 - scrubbers or other SO2 controls with baghouses anticipated.

Costs and Possible Retrofit Projects

- Approximately $1 Billion current estimate to comply with current and proposed rules
  - Clean Air Interstate Rule and Cross-State Air Pollution Rule
  - Industrial Boiler Maximum Achievable Technology rule
  - Best Available Retrofit Technology / Regional Haze Rule
  - Power Plant Mercury and Air Toxics Standards
  - SO2 2010 National Ambient Air Quality Standard
- At the Following Units:
  - Retrofit La Cygne 1 and 2 by June 2015
    - Wet scrubbers, activated carbon injection, SCR, baghouses, low-NOx burners, over-fired air
  - Retrofit Montrose 3 by approximately 2016
    - Possible installation of wet scrubber or other SO2 controls, SNCR, baghouse, activated carbon injection
  - Retrofit Sibley 3 by approximately 2016
    - Possible installation of wet scrubber or other SO2 controls, baghouse, activated carbon injection
- Other potential retrofits - Montrose 1 and 2, Sibley 1 and 2, and Lake Road Boiler 6/Unit 4 with potential emission control equipment