



**What are the True Costs of Compliance, Non-compliance,  
Inaction, and Emissions Reductions  
Utility Perspective**

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# Presentation Overview

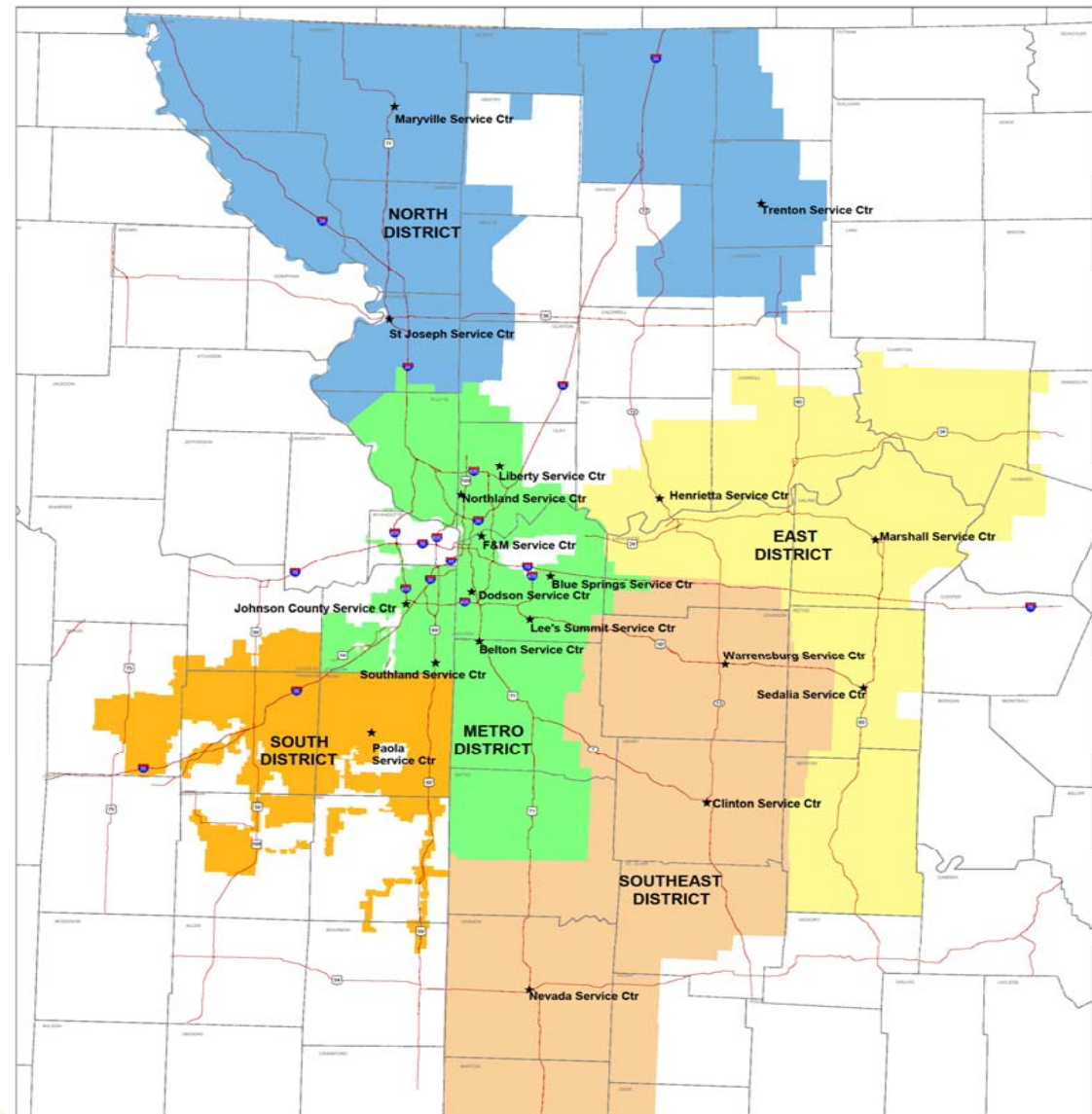
- Continuous Environmental Compliance
- Non-compliance Not an Option
- Inaction is Not Good Planning
- Comprehensive Energy Plan
- Integrated Resource Plan
- Collaboration Agreement
- Missouri Renewable Energy Ballot Initiative
- Kansas Renewable Energy Standards
- CO2 Capture and Sequestration Pilot Projects

# KCP&L Overview

- KCP&L is the regulated subsidiary of Great Plains Energy (NYSE: GXP)
- Headquartered in Kansas City, Missouri
- Engage in the generation, transmission, distribution and sale of electricity
- \$7.7 billion in assets at year-end 2008
- Serve more than 820,000 customers located in western Missouri and eastern Kansas
- Operates 9 plants and 36 generating units with a total generation capacity of about 6,000 MWs

# KCP&L Service Territory

- Regulated by commissions in two states:
  - **Missouri:**
    - Public Service Commission (MPSC)
  - **Kansas:**
    - Corporation Commission (KCC)



# KCPL's Comprehensive Energy Plan – 2005 to 2010



# KCPL's Comprehensive Energy Plan – Spearville Wind Facility

100.5 MW facility completed in Fall 2006.



# KCPL's Comprehensive Energy Plan – Iatan Unit 2

Construction started in 2006 and is on schedule for Summer 2010 in-service date.



# KCPL's Comprehensive Energy Plan – Energy Efficiency

## Demand Response and Energy Efficiency

- ❑ **Cool Homes** (incentives to customers to install high efficiency equipment)
- ❑ **Building Operator Certification** (energy efficiency training for facility operators)
- ❑ **MPower** (voluntary customer participation in curtailment)
- ❑ **Affordable New Homes / Low-Income Weatherization** (partnership with low income customers for energy efficient housing)
- ❑ **Energy Star Homes** (partnership with home builders to incorporate efficiencies into new home starts)
- ❑ **Energy Optimizer** (air conditioning cycling program for load reduction)





# Integrated Resource Plan

- ❑ MPSC rules set standards to govern the scope and objectives of the resource planning process.
- ❑ Objective of the resource planning process shall be to provide the public with energy services that are safe, reliable and efficient, at just and reasonable rates, in a manner that serves the public interest.
- ❑ KCP&L is considering many different demand-side and supply-side measures.
- ❑ Preferred plan submitted to MPSC:
  - Continuation of Comprehensive Energy Plan demand side management programs
  - Residential and aggressive commercial and industrial energy efficiency programs
  - 100 MW of wind annually up to a total addition of 400 MW
  - 154 MW of combustion turbines in 2029
- ❑ This preferred plan will be an input into our next comprehensive plan.

# Collaboration Agreement with Sierra Club

- ❑ **Result of collaboration**
- ❑ **Seek regulatory approval to undertake renewable energy, energy efficiency, and other projects to offset CO2 emission from Iatan Unit 2**
- ❑ **Energy efficiency - additional**
  - 100 MWs annual demand by 2010
  - 200 MWs annual demand by 2012
- ❑ **Wind energy – additional**
  - 100 MWs by 2010
  - 300 MWs by 2012
- ❑ **Emission goal**
  - Collaborate on goal of reducing CO2 20% by 2020
- ❑ **File for regulatory approval of net metering**

# Missouri Renewable Energy Ballot Initiative

- ❑ In 2008, Missouri voters approved an amended to Missouri law to require investor-owned electric utilities to generate or purchase electricity from renewable energy sources such as solar, wind, biomass (including ethanol) and hydropower. The required renewable energy sources must equal the following percentages of retail sales:
  - 2% by 2011
  - 5% by 2014
  - 10% by 2018
  - 15% by 2021.
- ❑ Of the total renewable energy sources required to be sold, at least 2% shall be solar sources.
- ❑ Also, any rate increase to consumers resulting from this measure must be no more than 1%.

# Kansas Renewable Energy Standards

- ❑ In 2009, Kansas passed the Renewable Energy Standards Act, requiring major utilities (not municipal utilities or most Rural Electric Cooperatives) to have:
  - 10% of their energy capacity from renewable sources by 2010,
  - 15% by 2016, and
  - 20% by 2020.
- ❑ To meet this, the utilities can purchase Renewable Energy Credits or generate their own power.
- ❑ If they generate their own, then each MW will count as 1.1 MW toward this RPS.
- ❑ Also note that the RPS is based on rated-capacity and not energy produced.

# CO2 Capture and Sequestration Pilot Projects

## Funding and Participating in Electric Power Research Institute Activities

- CO2 capture pilot tests
- Accelerated development of two to five most promising capture processes
- Impacts on drinking water aquifers if contacted by CO2 seeping from injection zone
- Assessment of impacts of CO2 impurities on compressors, pipelines, and injection wells
- Scoping study on flue gas clean-up needs for oxy-fired boilers prior to compression
- Approaches to developing a CO2 transport infrastructure
- Methodology for selecting CO2 transport and storage arrangements based on business factors

# CO2 Capture and Sequestration Pilot Projects

## Shallow Carbon Sequestration Pilot Demonstration

- ❑ The pilot demonstration will be conducted at site in Springfield, Missouri.
- ❑ The site is underlain by a relatively shallow (2,000 ft.) sequence of sedimentary strata overlying igneous and metamorphic basement rock and is far removed from the large geological basins that are currently being studied for carbon sequestration.
- ❑ The target formation for carbon sequestration is the Lamotte Sandstone, a saline, highly mineralized aquifer that directly overlies the basement rock.
- ❑ The Lamotte is separated from the shallower Ozark Aquifer by dolomitic shale layers that form a confining layer between the Ozark Aquifer and the Lamotte.
- ❑ A preliminary site characterization completed in 2006 showed the Lamotte Sandstone to hold promise for carbon sequestration.
- ❑ The pilot demonstration will be unique in that carbon dioxide would be injected in gaseous rather than liquid form, at the target depths.
- ❑ The viability of shallow injection and the mechanisms for carbon dioxide trapping have not been extensively studied to date.