

# Kentucky's Greenhouse Gas Policy Framework under Section 111(d) CAA

---

Kentucky Department for Energy Development  
and Independence

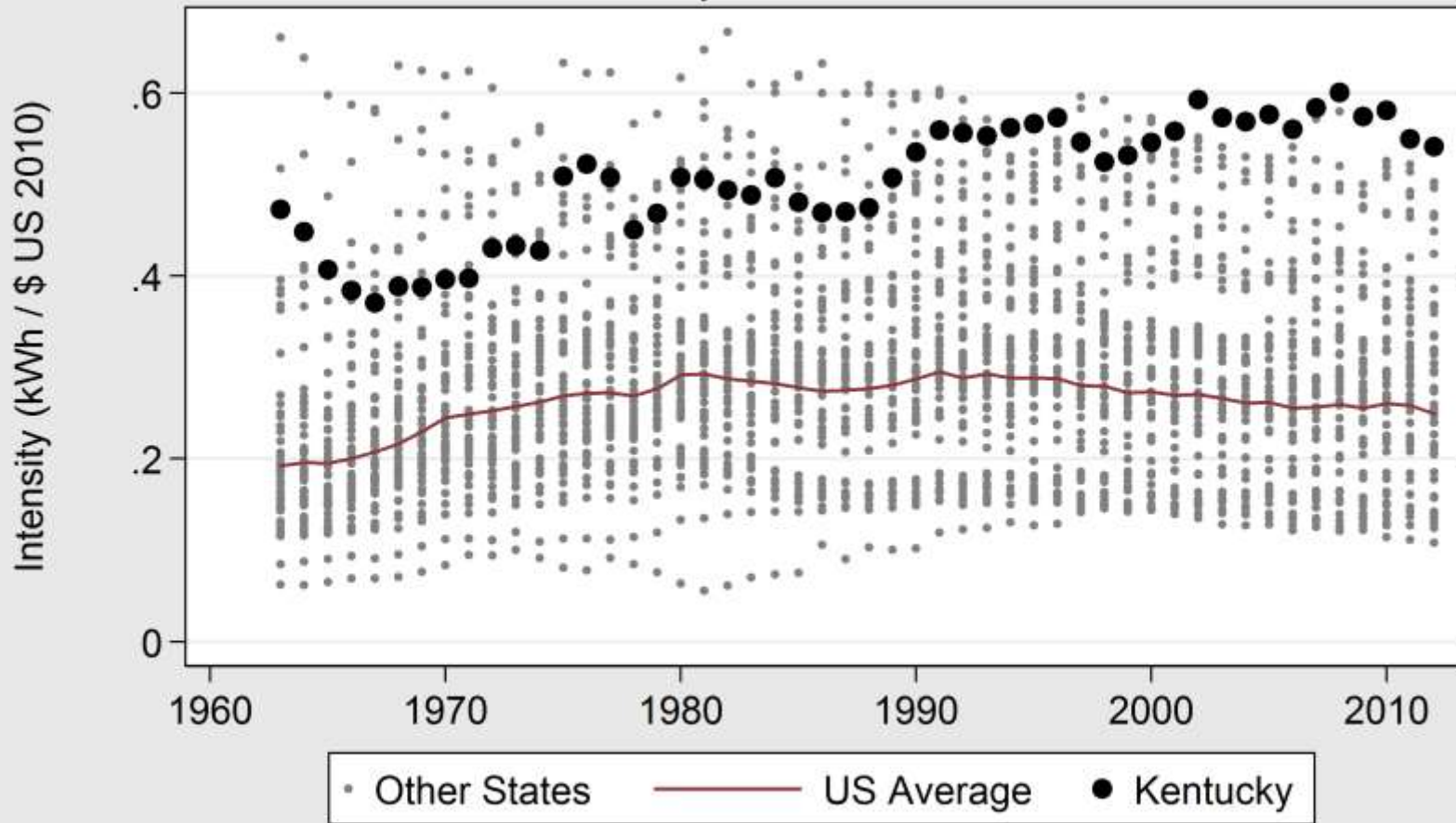
Energy and Environment Cabinet

2014 NASEO Energy Policy Outlook Conference  
Washington DC



# Electricity Consumption per State GDP Dollar, 1963-2012

## Kentucky vs. the United States



Kentucky Energy Database, EEC-DEDI, 2013

Data Source: EIA Forms 861 & 826 & BEA GDP by State

2012

Top 25  
Electricity  
Intensive  
States  
Ranked by  
kwh/\$GDP

State	Electricity Consumption per Dollar of State GDP (kWh)	Rank of Electricity Consumption per Dollar of State GDP
Kentucky	0.541	1
Mississippi	0.503	2
Alabama	0.496	3
West Virginia	0.468	4
South Carolina	0.467	5
Wyoming	0.465	6
Arkansas	0.449	7
Idaho	0.424	8
Oklahoma	0.386	9
Indiana	0.368	10
Tennessee	0.368	11
Louisiana	0.366	12
Montana	0.359	13
Missouri	0.336	14
North Dakota	0.334	15
Georgia	0.320	16
Nebraska	0.318	17
Iowa	0.316	18
Ohio	0.314	19
New Mexico	0.304	20
Kansas	0.304	21
Florida	0.296	22
North Carolina	0.296	23
Arizona	0.296	24
South Dakota	0.294	25
United States	0.249	

# 2012

## Intensity

## Price

## Coal Generation

State	Electricity Consumption per Dollar of State GDP (kWh)	Rank of Electricity Consumption per Dollar of State GDP	Real Total Electricity Price (Cents per kWh)	Rank of Real Total Electricity Price	Coal-Fired Electricity Generation as a Percentage of Total	Rank of Coal-Fired Electricity Generation as a Percentage of Total
Kentucky	0.541	1	6.83	46	92%	2
Mississippi	0.503	2	8.12	32	13%	36
Alabama	0.496	3	8.68	23	30%	28
West Virginia	0.468	4	7.72	40	96%	1
South Carolina	0.467	5	8.57	27	30%	29
Wyoming	0.465	6	6.82	47	88%	3
Arkansas	0.449	7	7.19	44	43%	20
Idaho	0.424	8	6.55	50	0%	46
Oklahoma	0.386	9	7.10	45	37%	24
Indiana	0.368	10	7.82	39	81%	4
Tennessee	0.368	11	8.79	21	46%	17
Louisiana	0.366	12	6.56	49	21%	31
Montana	0.359	13	7.85	37	51%	14
Missouri	0.336	14	8.04	34	79%	5
North Dakota	0.334	15	7.46	41	78%	6
Georgia	0.320	16	8.80	20	33%	26
Nebraska	0.318	17	7.91	36	72%	8
Iowa	0.316	18	7.34	43	62%	13
Ohio	0.314	19	8.62	26	67%	10
New Mexico	0.304	20	8.38	30	68%	9
Kansas	0.304	21	8.76	22	62%	12
Florida	0.296	22	10.02	15	20%	33
North Carolina	0.296	23	8.63	25	44%	18
Arizona	0.296	24	9.31	18	36%	25
South Dakota	0.294	25	8.01	35	24%	30
United States	0.249		9.83		37%	

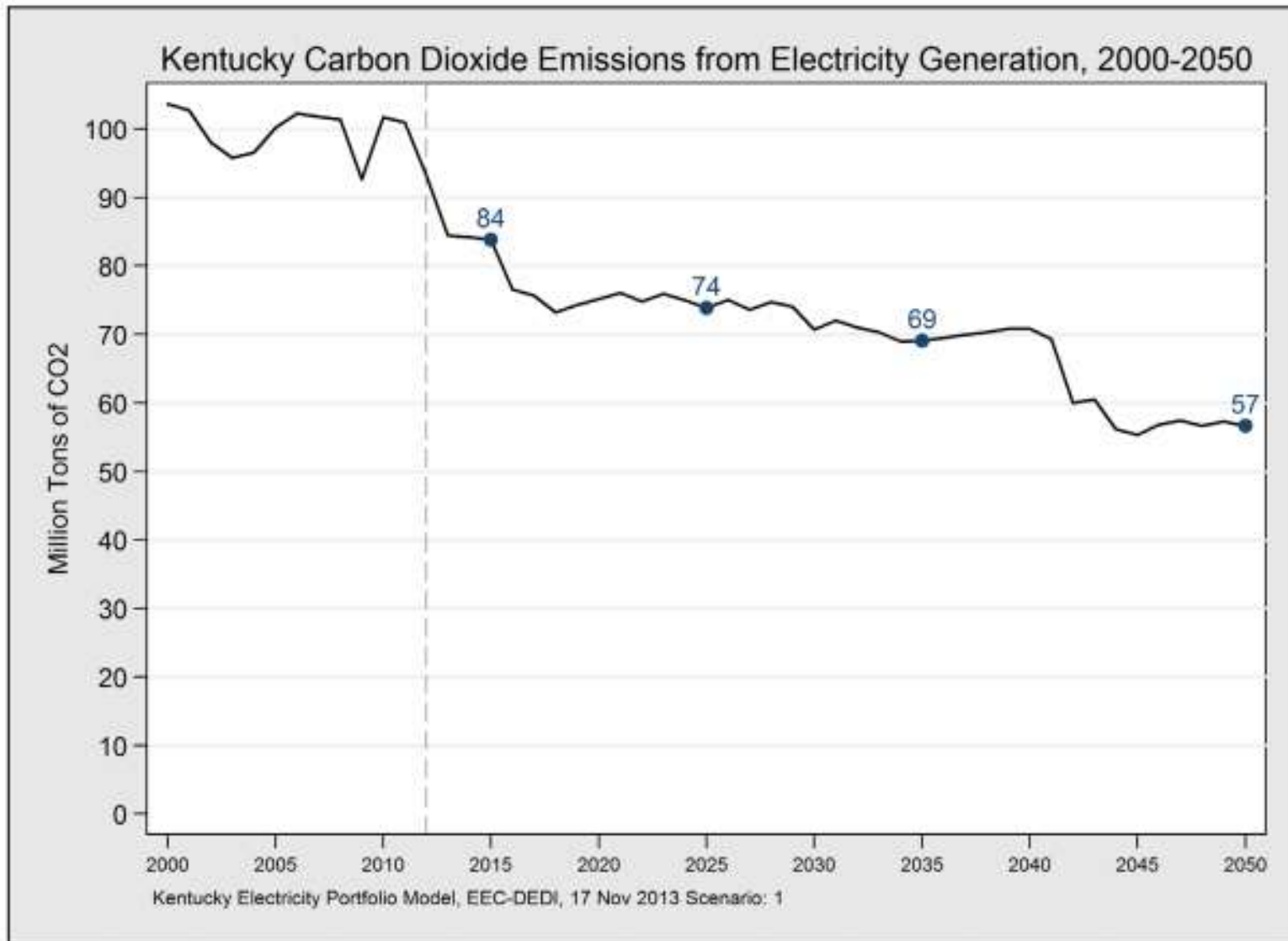
# Framework Assumptions

---

- Each major GHG emissions sector will contribute proportionately to any overall emissions reduction strategy.
- Greenhouse gas emissions from transportation sources will be handled through federal regulations such as Corporate Average Fuel Economy (CAFE) standards.
- Proportionate GHG emissions from other non-electric generating unit (EGU) emitting sources will be handled under other EPA-proposed regulations.
- EGU-equivalent emission reductions in Kentucky will be met through emission reductions at the source, reductions through efficiency and conservation, and carbon offsets.

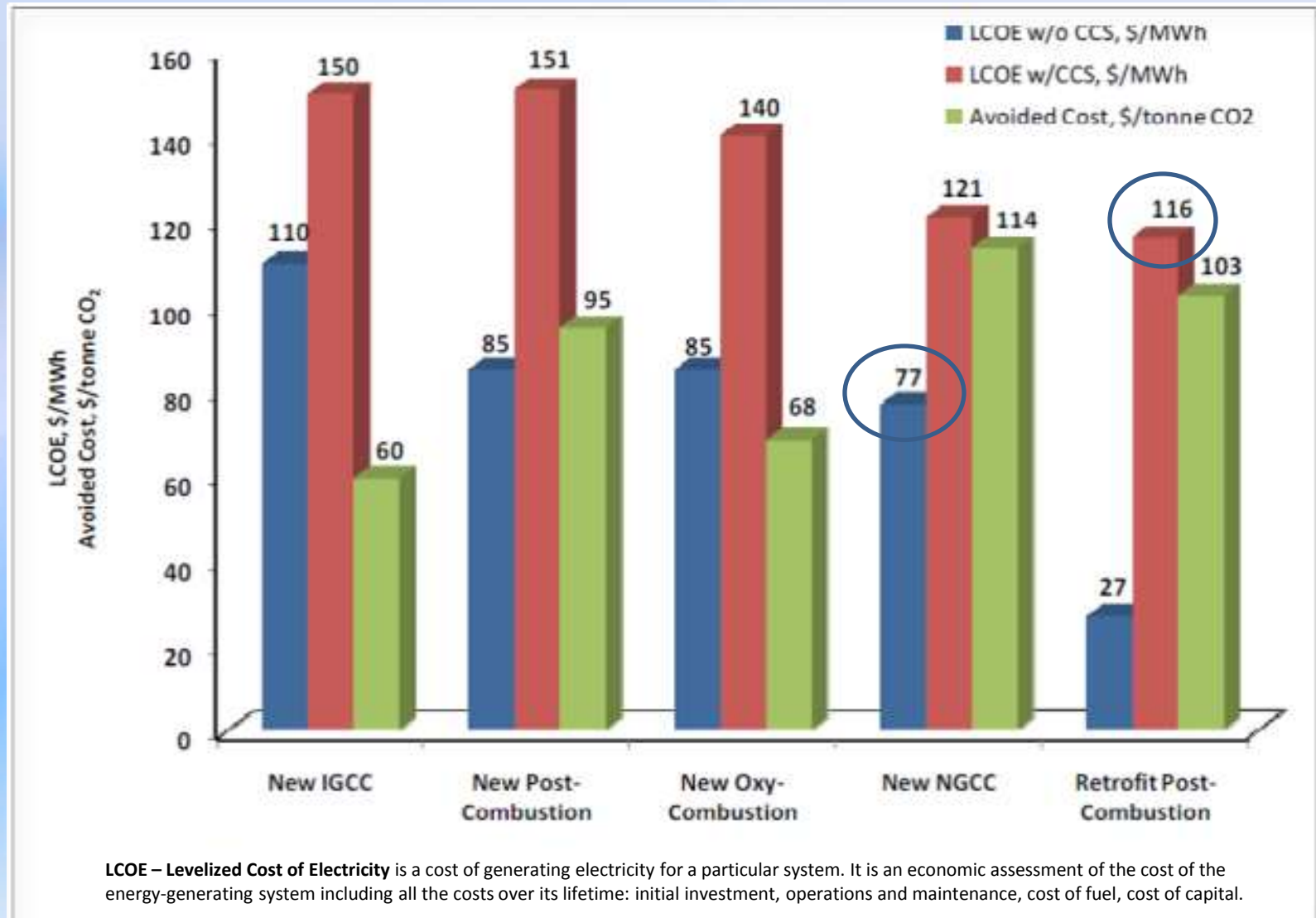
# Kentucky CO2 Emissions from Electricity Generation, 2000-2050

## Reference Case Projections



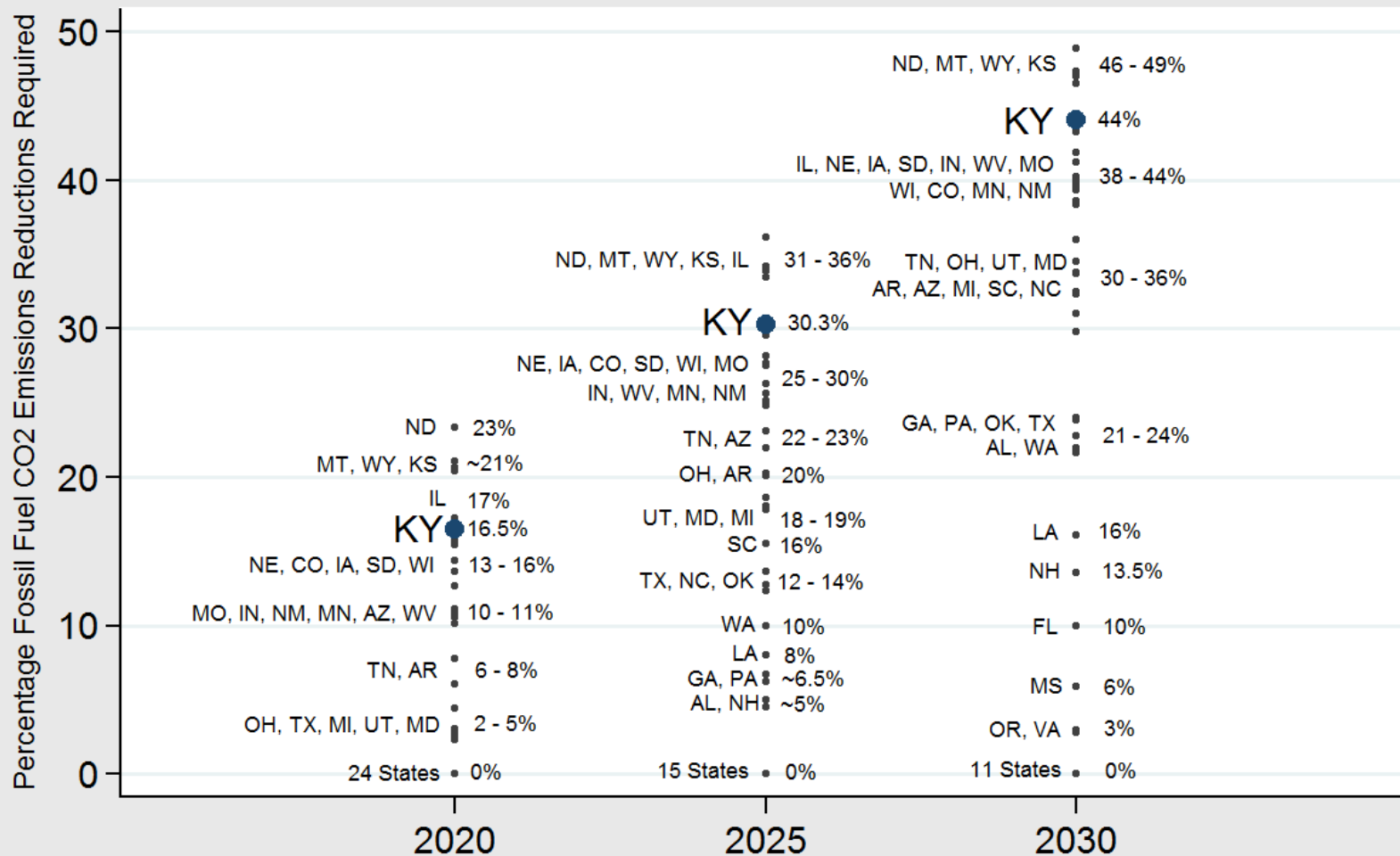
# CCS Cost Variation Among Different Generating Sources

Carbon Capture and Sequestration (CCS)



# Emission Reductions Based on NRDC Benchmarks, Fossil Fleet Only

## NRDC Carbon Dioxide Emission Reduction Requirements by State, 2012-2030



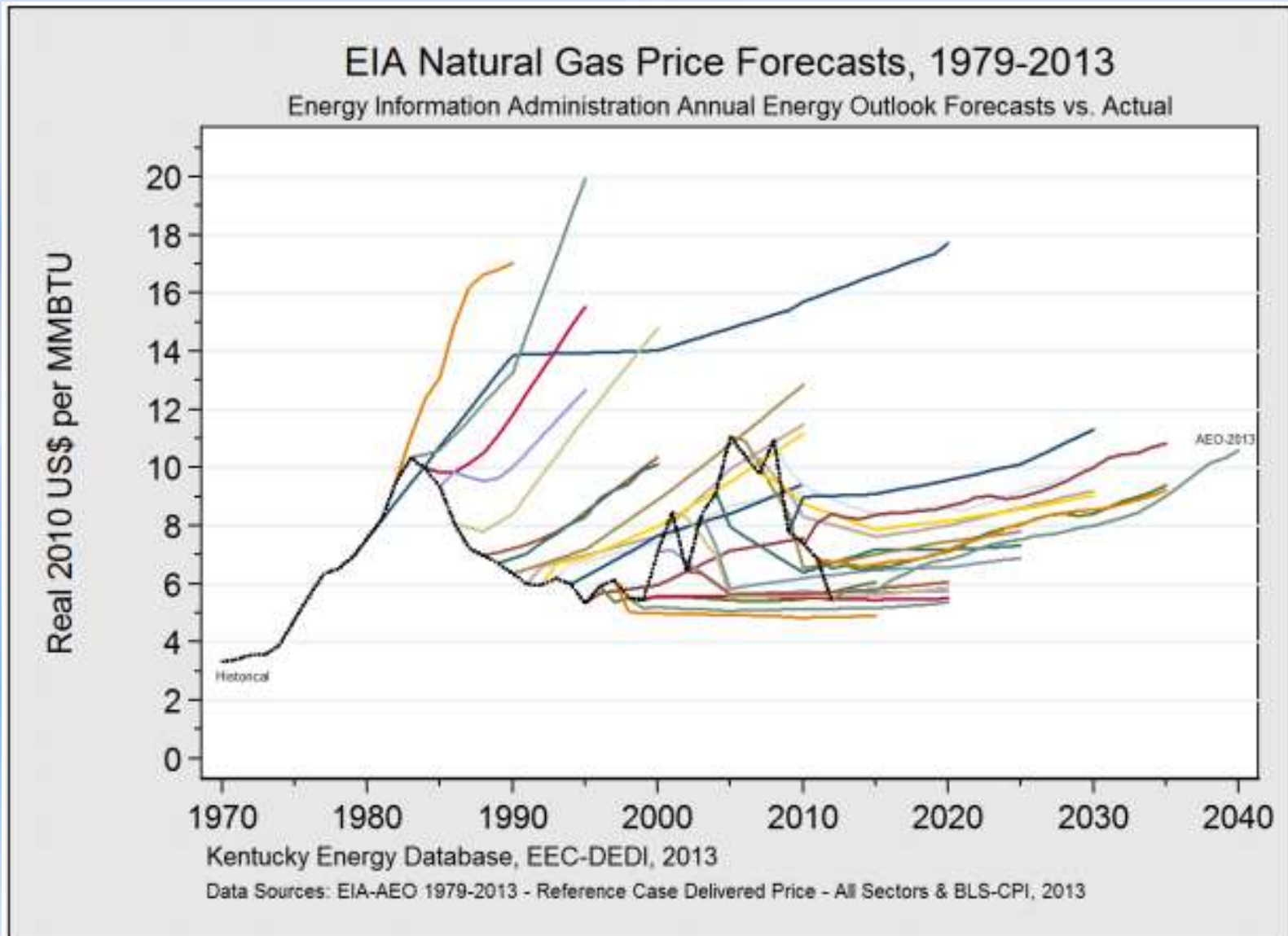
Kentucky Energy Database, EEC-DEDI, 2013

Percentage Change Required from 2012 EPA Clean Air Markets Program Data, Queried 9/1/2013



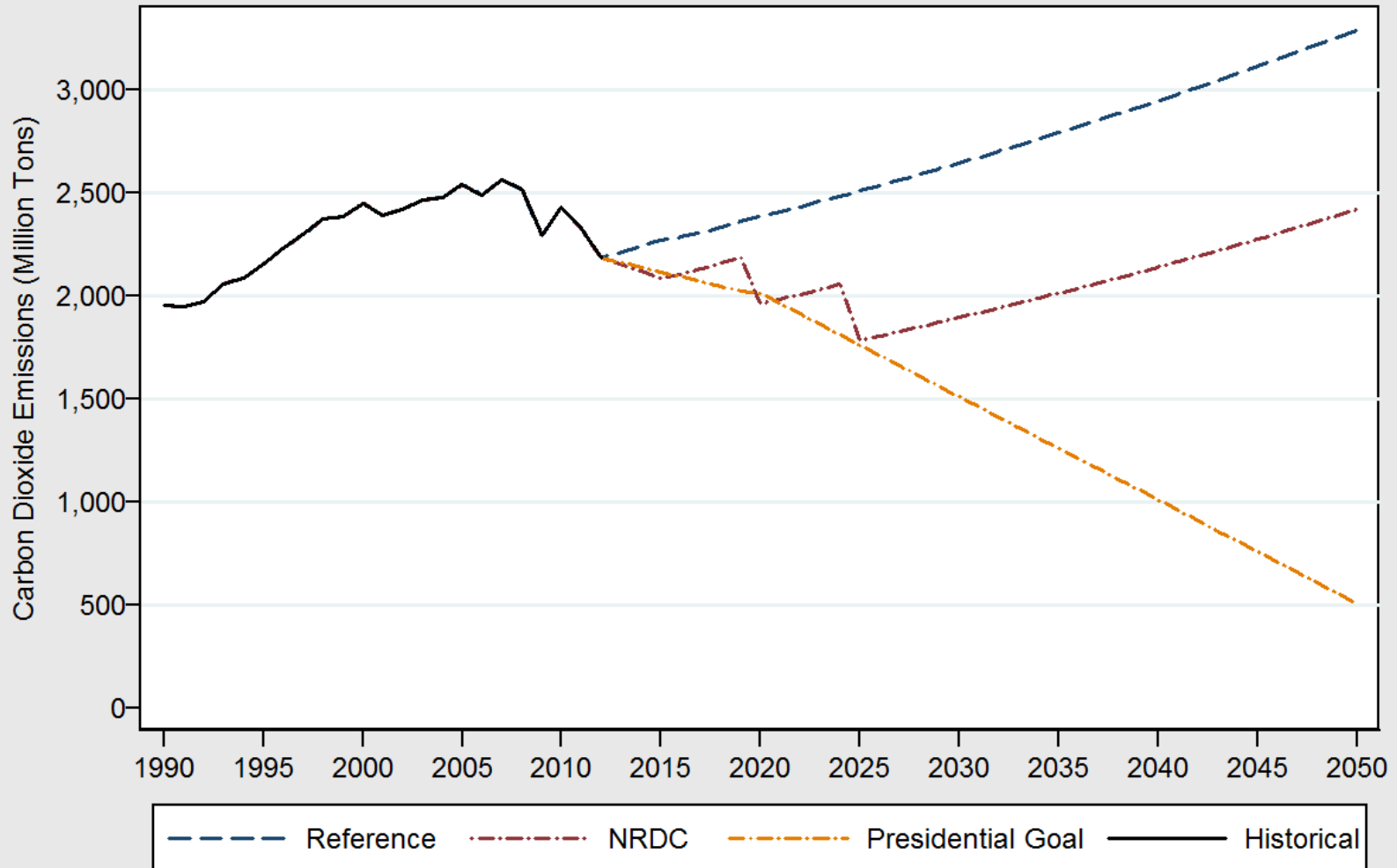


# EIA Natural Gas Price Forecasts vs. Observed Natural Gas Prices



# U.S. CO2 Emission Forecasts, 1990-2050

United States Carbon Dioxide Emissions from Electricity Generation, 1990-2050



Kentucky Energy Database, EEC-DEDI, 2013

# Policy Framework

---

- Set 2005 as statewide CO2 baseline for EGUs
- Apply a mass reduction standard achievable through multiple compliance options
- Receive credit for CO2 reductions from baseline
- Allow for a suite of compliance options
- Set enforcement and monitoring protocol

# Compliance Options

---

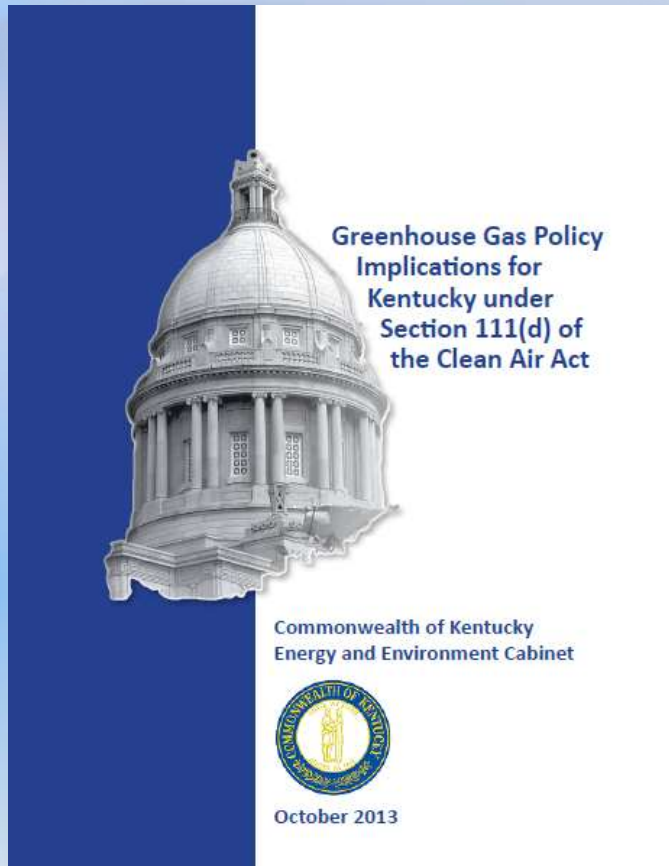
- Demand-side energy efficiency
- Supply-side conservation or efficiency programs
- Transmission upgrades
- Renewable and other low-carbon energy projects at the affected source or at the consumer level
- Carbon Capture and Sequestration (CCS) technology
- Fuel switching to lower emitting fuels
- Quantifiable and verifiable offsets
- Participation in regional or national market-based CO2 credit-trading programs

# Conclusions


---

- Engage EPA and **actively participate** in stakeholder events.
- Push for **flexibility** afforded under CAA 111(d) to ensure reasonable standards are proposed.
- Advocate a **mass emissions** reduction plan rather than a standard of performance specific to a particular unit.
- Urge EPA to consider a **system-wide** (generation, transmission and consumption) approach to emissions reduction as opposed to reductions only at the plant.
- Insist that EPA find a way to give **full credit** for energy efficiency measures and plant shut downs/fuel switching occurring due to other rules.


# eec.ky.gov



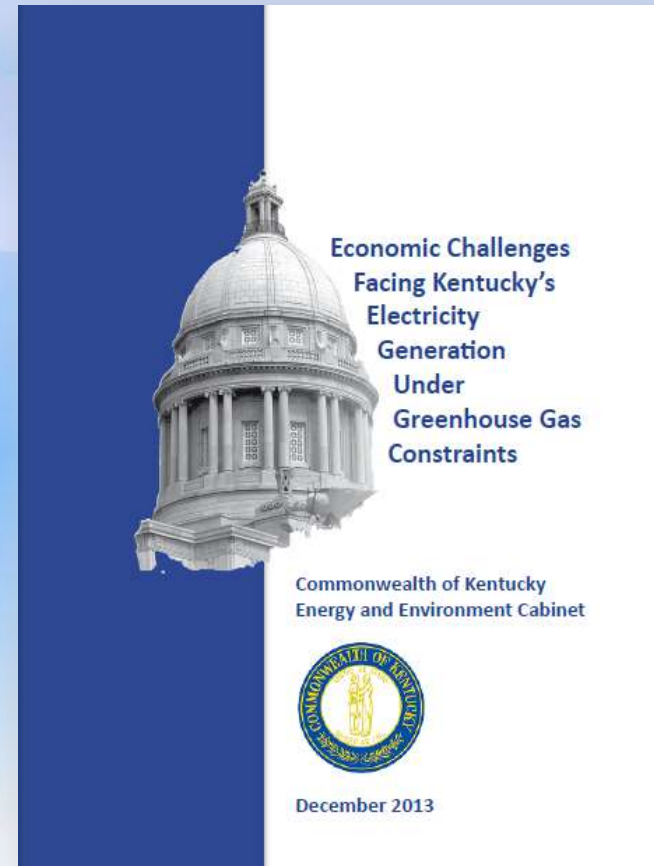
**Greenhouse Gas Policy  
Implications for  
Kentucky under  
Section 111(d) of  
the Clean Air Act**




Commonwealth of Kentucky  
Energy and Environment Cabinet




October 2013



**Economic Challenges  
Facing Kentucky's  
Electricity  
Generation  
Under  
Greenhouse Gas  
Constraints**



Commonwealth of Kentucky  
Energy and Environment Cabinet



December 2013



Kentucky Department for Energy Development  
and Independence  
Energy and Environment Cabinet

500 Mero Street  
Frankfort, KY 40601

[www.energy.ky.gov](http://www.energy.ky.gov)

502-564-7192