GREENHOUSE GAS POLICY IMPLICATIONS FOR KENTUCKY'S ENERGY FUTURE

Presented by
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Kentucky Energy and Environment Cabinet
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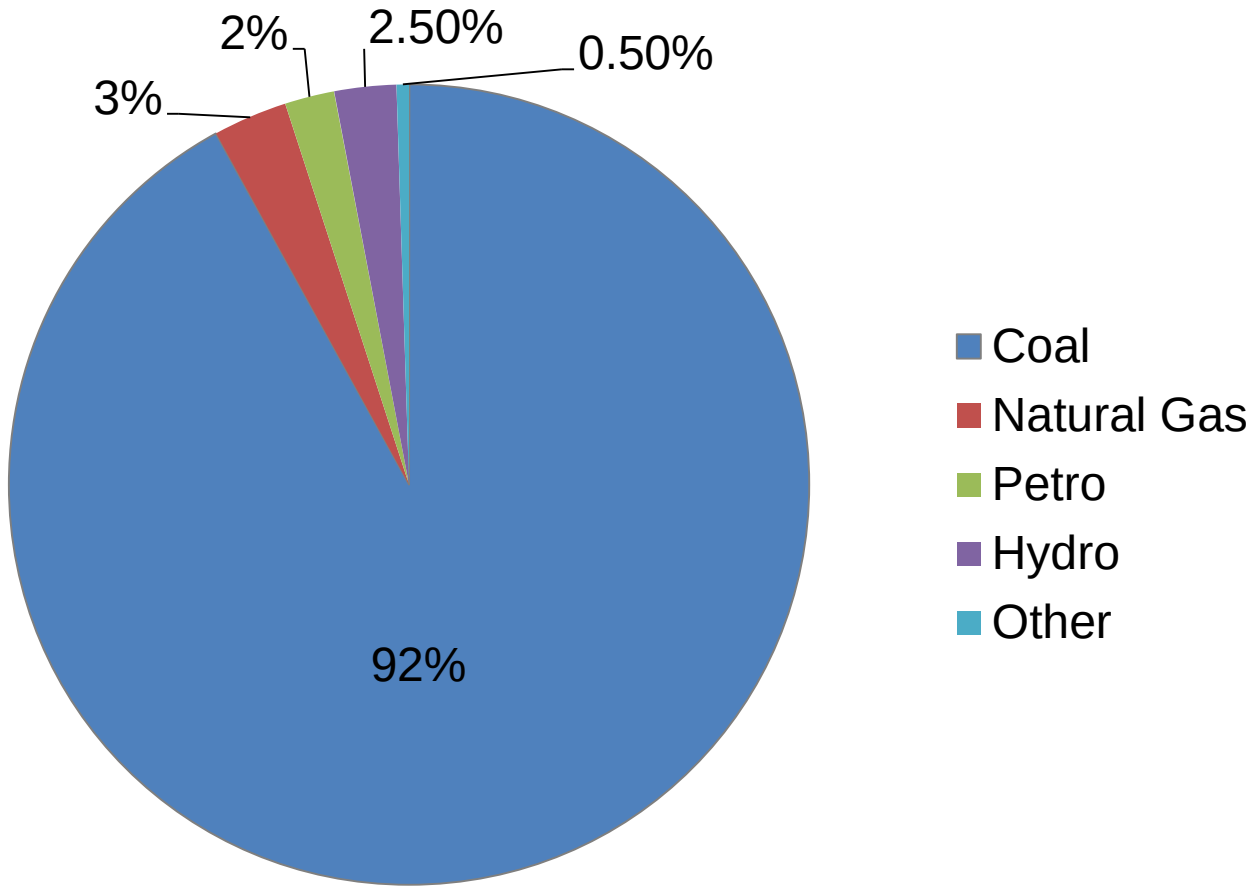
Section 111(d) – Existing Sources

- Preceded by issuance of an NSPS under 111(b) for new sources
- Regulatory Mechanism – 40 CFR 60 Subpart B
- Why Subpart B? – 60.22(d)(1) – Welfare pollutant
- EPA issues guideline document
- States submit “SIP” like plan
- If state fails to submit or EPA disapproves, then EPA will issue a federal plan

Burning Questions

- What are “meaningful carbon reductions”?
- Will EPA set a reduction target expressed as a emission rate by unit and fuel type or something more broad?
- Does the definition of stationary source allow a “beyond the fence line” approach?
- What is Best System of Emission Reduction?
- How will cost of reduction be calculated?
- What is adequately demonstrated?
- What is remaining useful life?

Kentucky's 2012 Electricity Generation

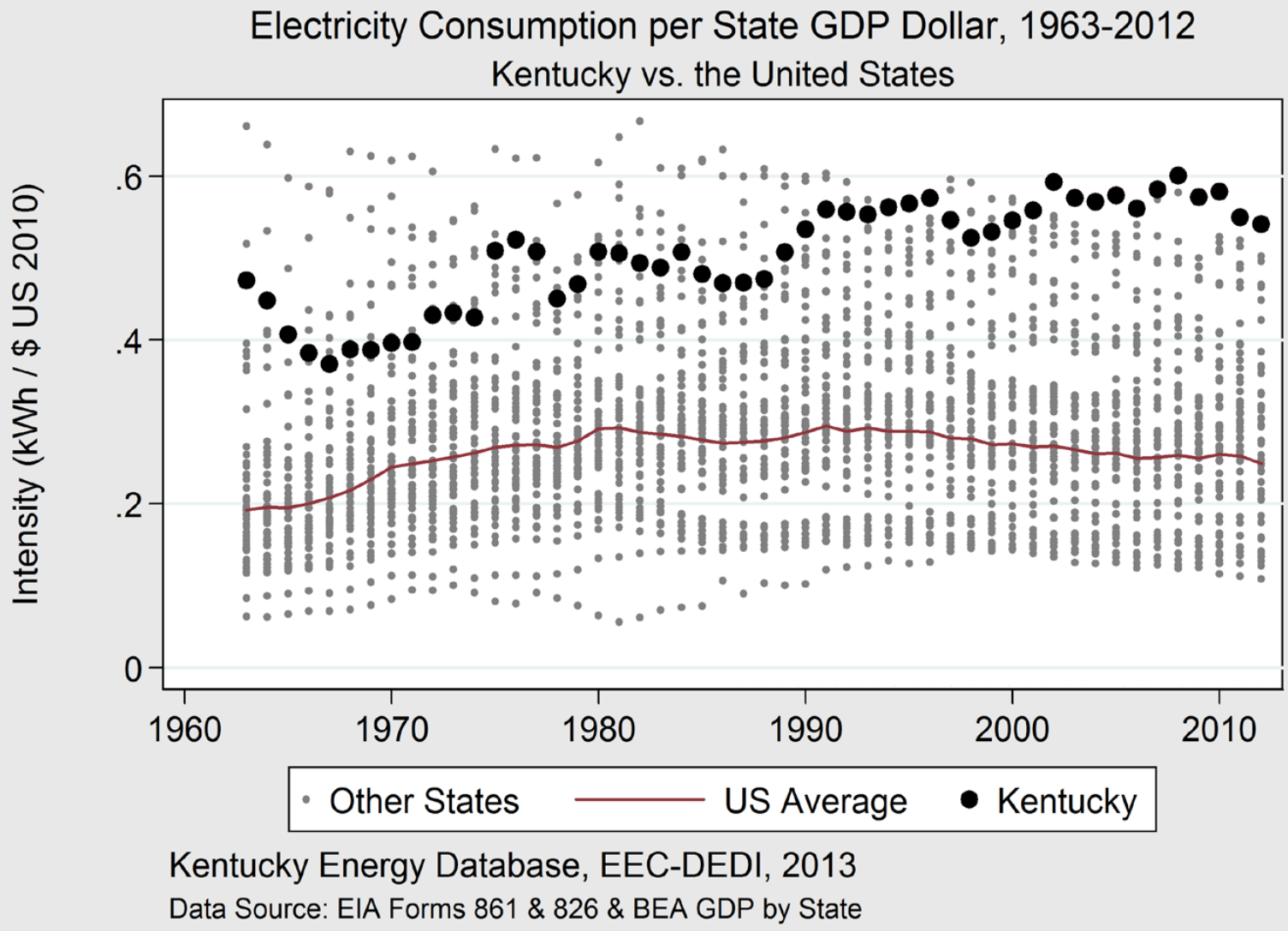


EEC 111 (d) Whitepaper

- Issued on October 22, 2013
- Focuses on Kentucky's electricity intensive manufacturing sector
- Discusses a potential framework with various compliance options
- Compares two divergent approaches of an emissions reduction program
- Promotes maximum flexibility afforded under 111(d)

Framework Objectives

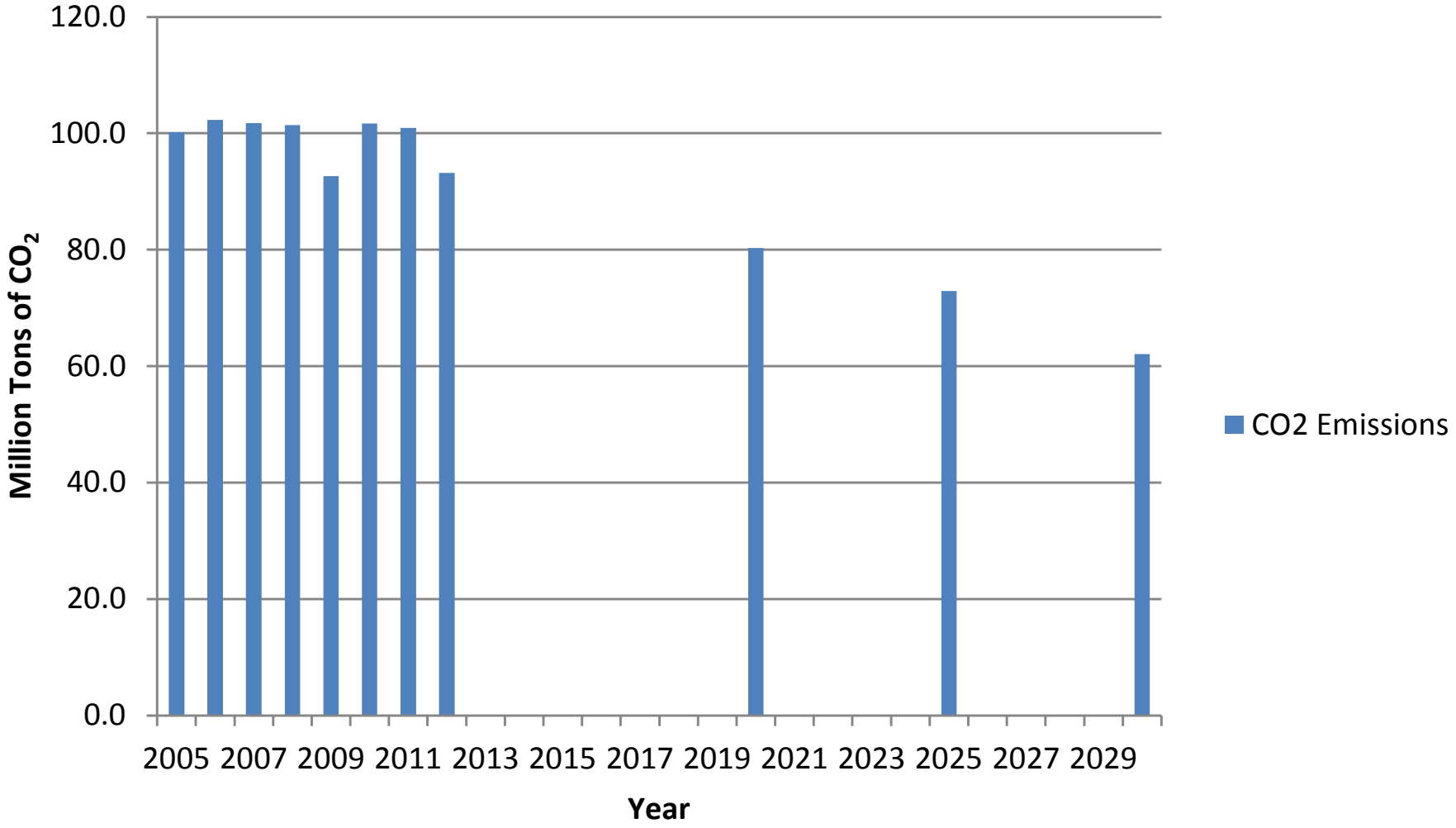
- Utilize a mass emissions reduction vs. rate-based standard
- Ensure EGUs have time to transition to a cleaner fleet
- Provide that the EGU sector has flexibility to choose a least-cost option
- Encourage diversity in Kentucky's fleet


Electricity Consumption per State GDP Dollar, 1963-2012
Kentucky vs. the United States
Intensity (kWh / $ US 2010)
0
.2
.4
.6
1960
1970
1980
1990
2000
2010
Other States
US Average
Kentucky
Kentucky Energy Database, EEC-DEDI, 2013
Data Source: EIA Forms 861 & 826 & BEA GDP by State

Electricity Intensity by State, 2012

Rank	State	Electricity Intensity kWh of Electricity Consumption per Real GDP	Rank	State	Electricity Intensity kWh of Electricity Consumption per Real GDP
1	Kentucky	0.541	27	Nevada	0.277
2	Mississippi	0.503	28	Texas	0.274
3	Alabama	0.496	29	Michigan	0.274
4	West Virginia	0.468	30	Washington	0.260
5	South Carolina	0.467	31	Virginia	0.259
6	Wyoming	0.465	32	Pennsylvania	0.253
7	Arkansas	0.449	33	United States	0.249
8	Idaho	0.424	34	Oregon	0.247
9	Oklahoma	0.386	35	Minnesota	0.240
10	Indiana	0.368	36	Utah	0.240
11	Tennessee	0.368	37	Maine	0.227
12	Louisiana	0.366	38	Illinois	0.216
13	Montana	0.359	39	Vermont	0.212
14	Missouri	0.336	40	Colorado	0.207
15	North Dakota	0.334	41	Maryland	0.205
16	Georgia	0.320	42	Delaware	0.185
17	Nebraska	0.318	43	New Hampshire	0.177
18	Iowa	0.316	44	Rhode Island	0.159
19	Ohio	0.314	45	New Jersey	0.157
20	New Mexico	0.304	46	Massachusetts	0.142
21	Kansas	0.304	47	Hawaii	0.140
22	Florida	0.296	48	California	0.136
23	North Carolina	0.296	49	Connecticut	0.135
24	Arizona	0.296	50	Alaska	0.130
25	South Dakota	0.294	51	New York	0.124
26	Wisconsin	0.277	52	District of Columbia	0.108

KY CO_2 Trends and Anticipated Reductions



Kentucky's Current and Future Estimates of Fossil Fleet CO_2 Mass Emission Reductions

	2005	2012	Scenario #1* 2020	Scenario #2* 2025	Scenario #3** 2030
Million Tons of CO_2 Emission data from CAMD Acid Rain Database	100	93	80	72	62
% Reduction from 2005		7%	20%	27%	38%

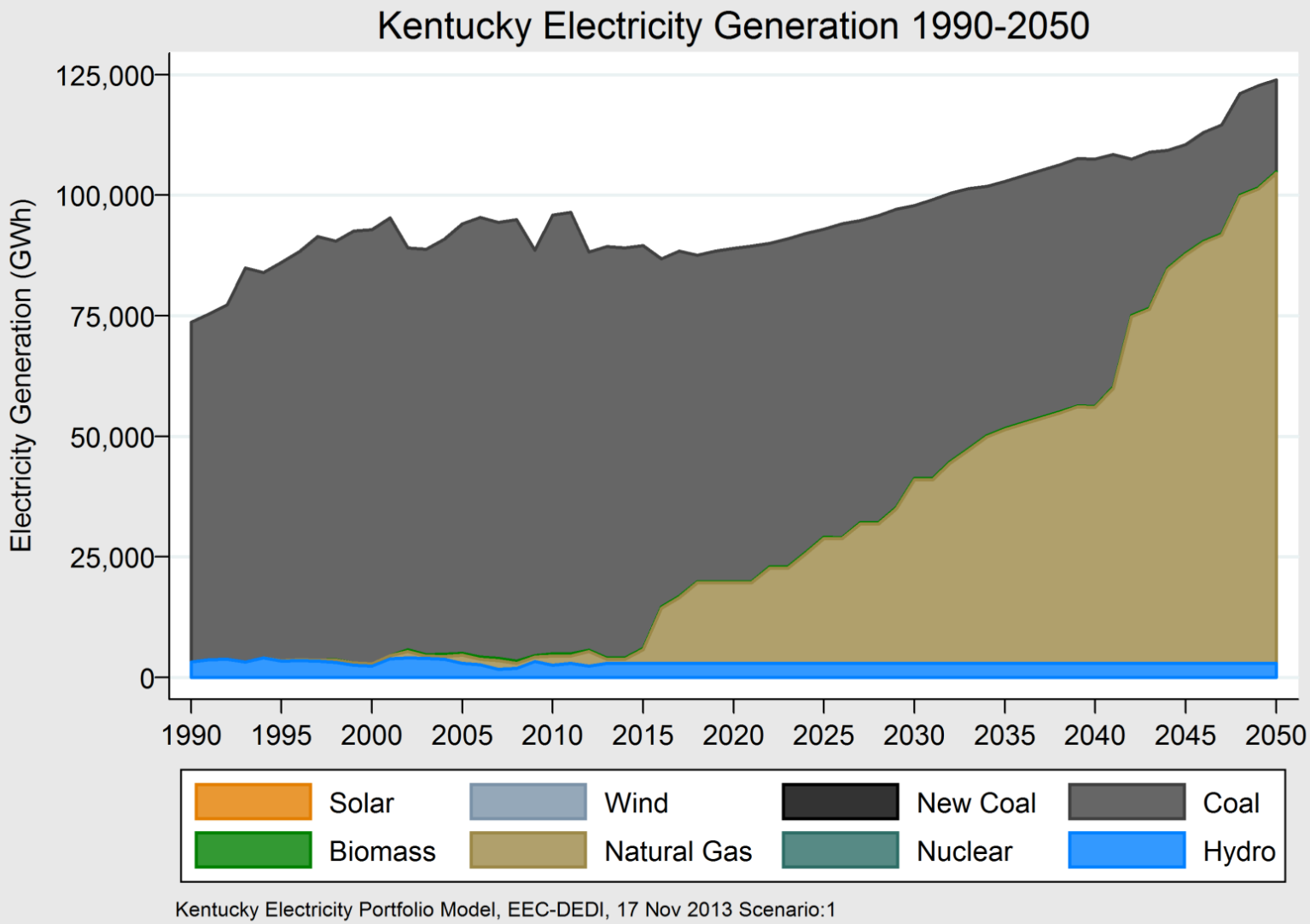
Possible Compliance Options

- Demand-side Management (DSM)
- Supply-side Efficiency
- Transmission Upgrades
- Renewable Energy
- CCS Technology
- Fuel Switching
- Offsets
- Market-based Programs

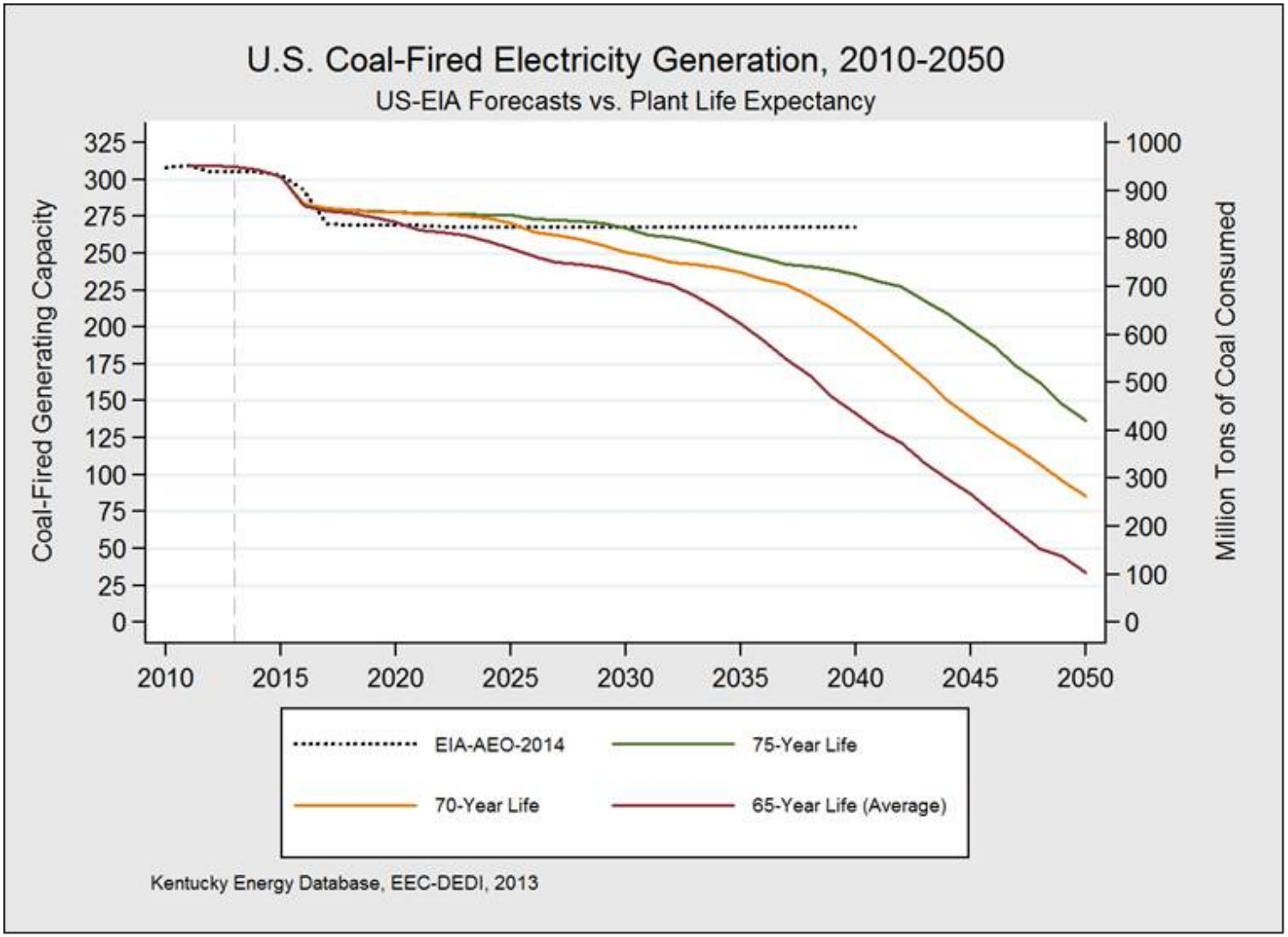
EEC Paper on Energy Outlook Under Carbon Constraints

- Issued on December 16, 2013
- Companion paper to the 111(d) white paper
- Study initiated in early June 2013
- Information obtained from all Kentucky Investor Owned Utilities
- Employs a custom-built dispatch model
- Four policy options (BAU, Flexible Portfolio, Balanced Portfolio, Coal Portfolio) run with high and low NG prices

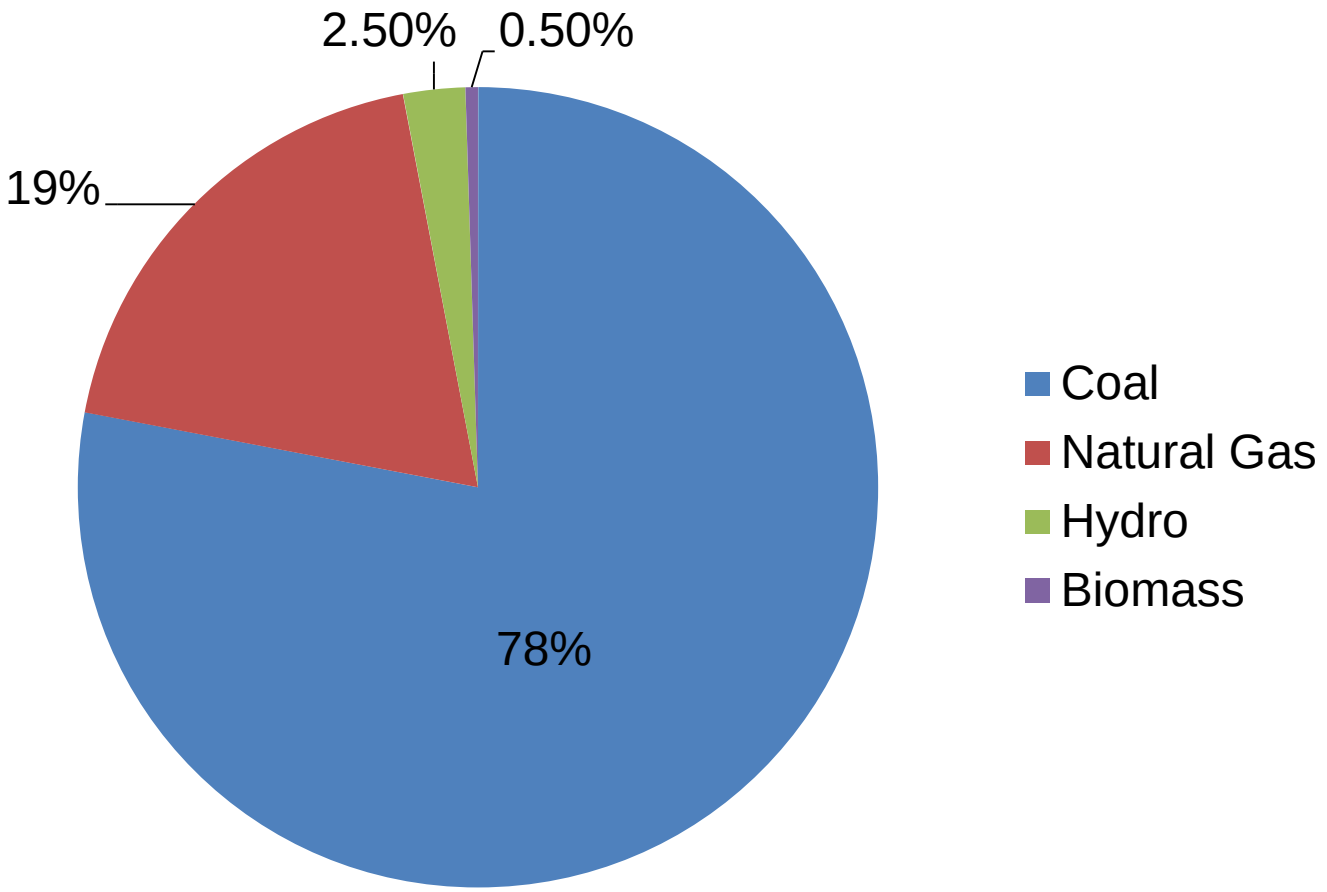
Modeling Reference Case



Our Aging Coal-fired Generation



Kentucky's 2020 Projected Electricity Generation (w/o any GHG regulations)



Conclusions

- Discussions on 111(d) have evolved since the white paper was issued.
- EEC has not conceded any legal positions on the extent of EPA's authority under 111(d).
- Kentucky's energy profile will change considerably even without GHG regulations.
- EEC's national involvement in the stakeholder process is crucial to protecting Kentucky's manufacturing jobs.
- Environmental regulations and market forces are forcing diversity to Kentucky's energy profile.

Thank You

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