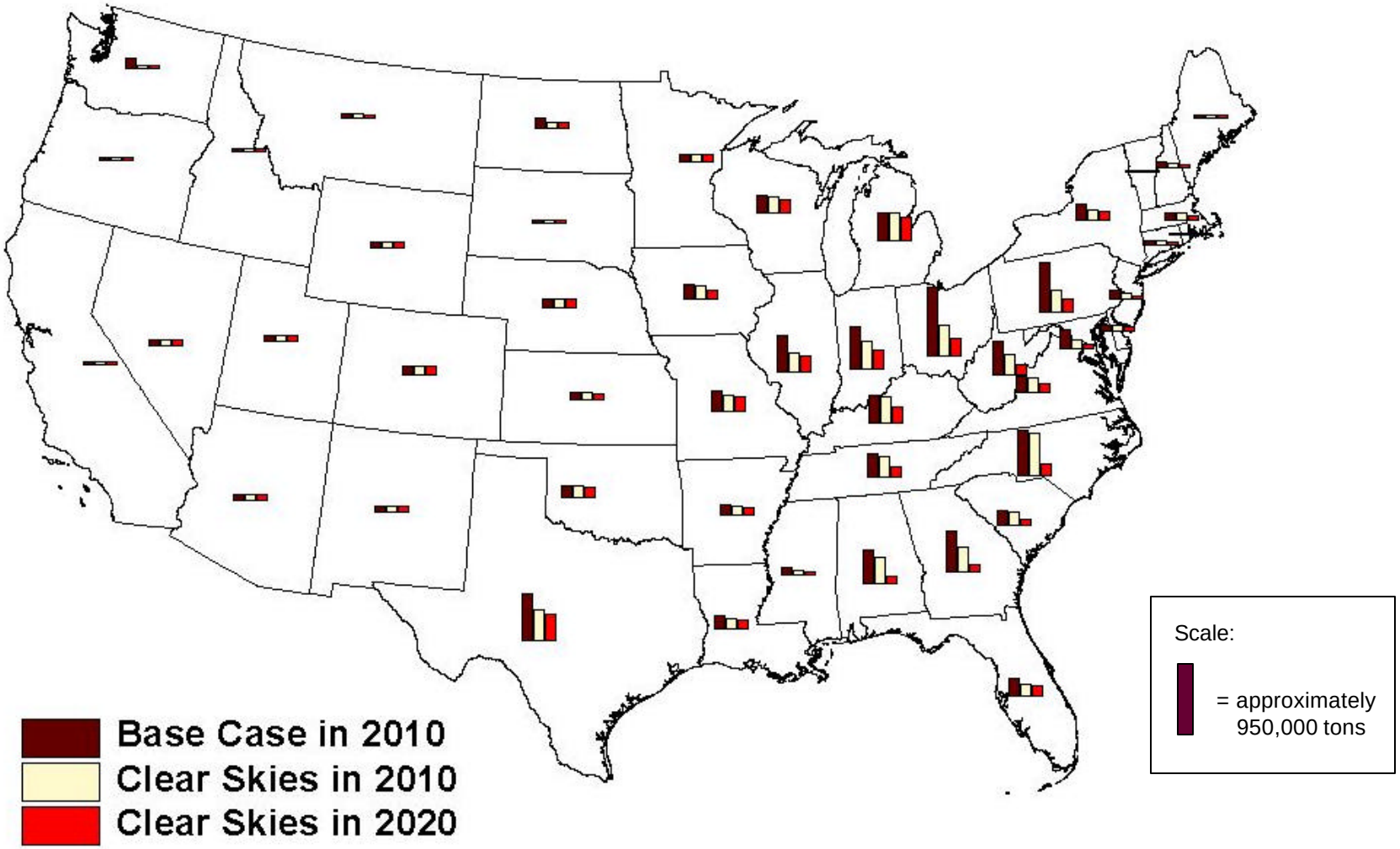
Section E:

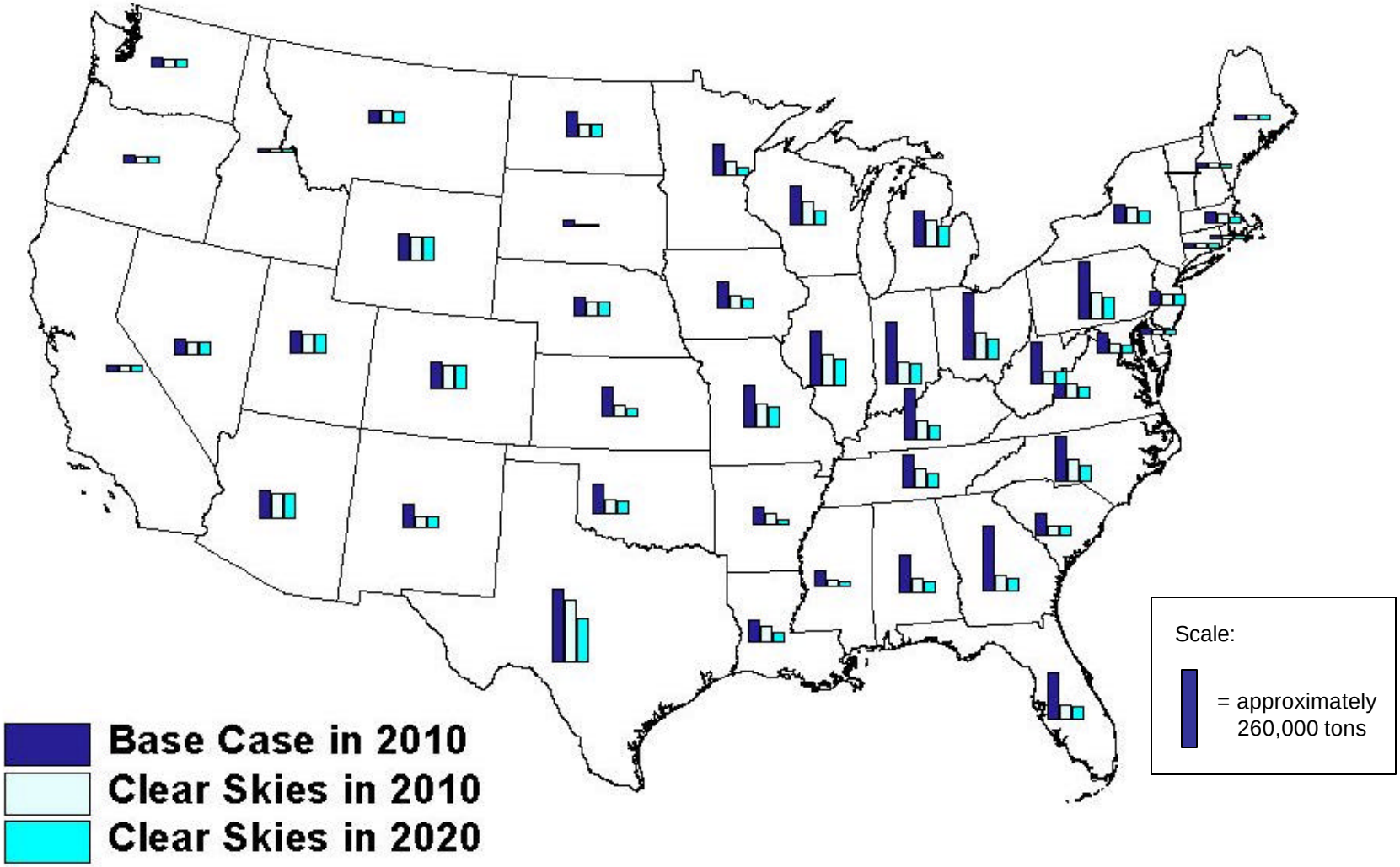
Projected Impacts on the State and Regional-Level

Emissions of Sulfur Dioxide



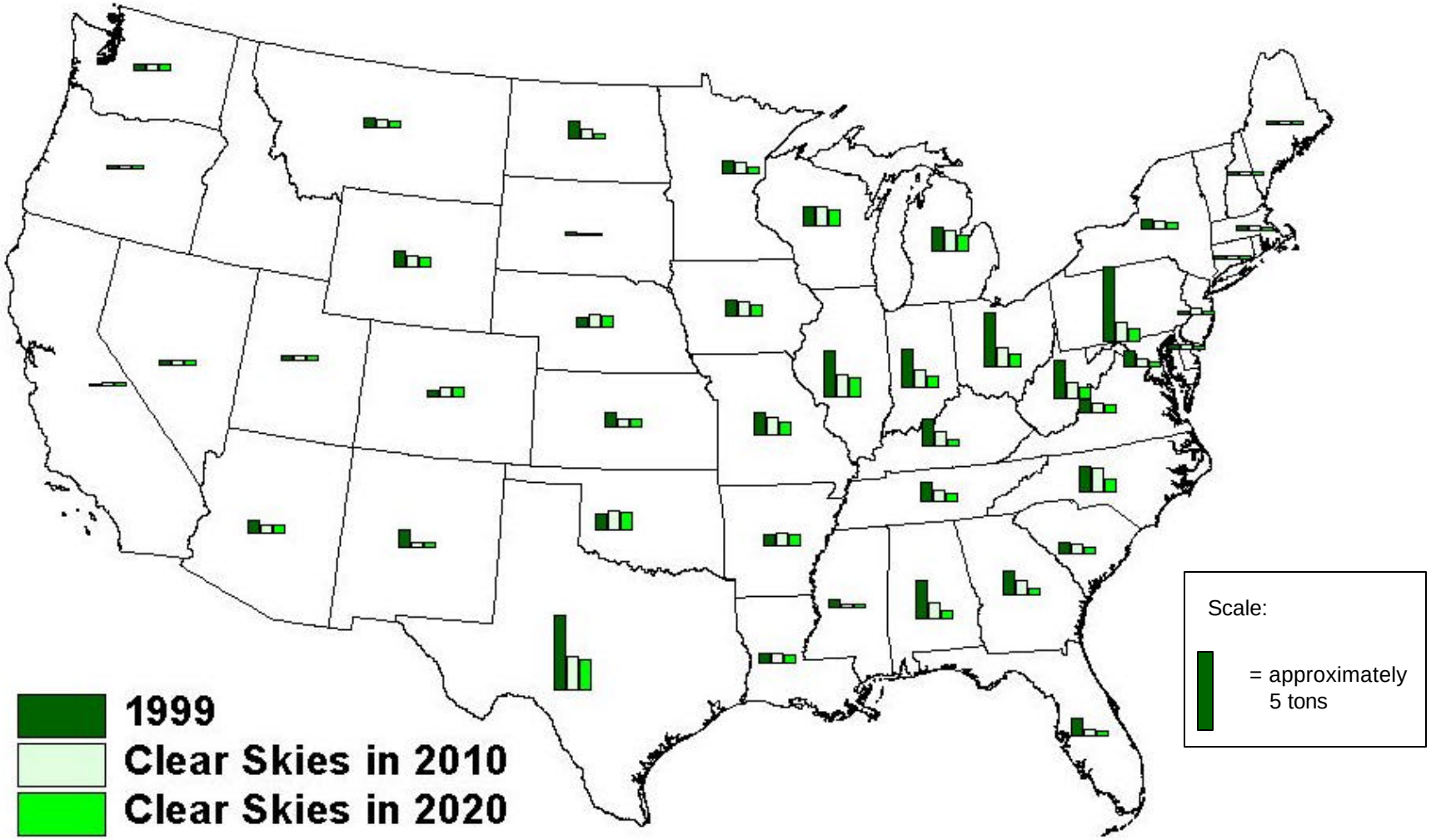
Note: Total emissions under the Base Case in 2010 would be 9.6 million tons; total emissions under Clear Skies in 2010 would be 6.6 million tons; total emissions under Clear Skies in 2020 would be 3.9 million tons. Emissions will continue to decline after 2020 until the cap level is reached. Emissions are from electric generating facilities greater than 25MW. The EPA 2000 Base Case in IPM includes Title IV, the NOx SIP Call, and state-specific caps in Connecticut, Missouri and Texas. The Base Case does not include any potential future regulations to implement the current CAA.

Emissions of Nitrogen Oxide



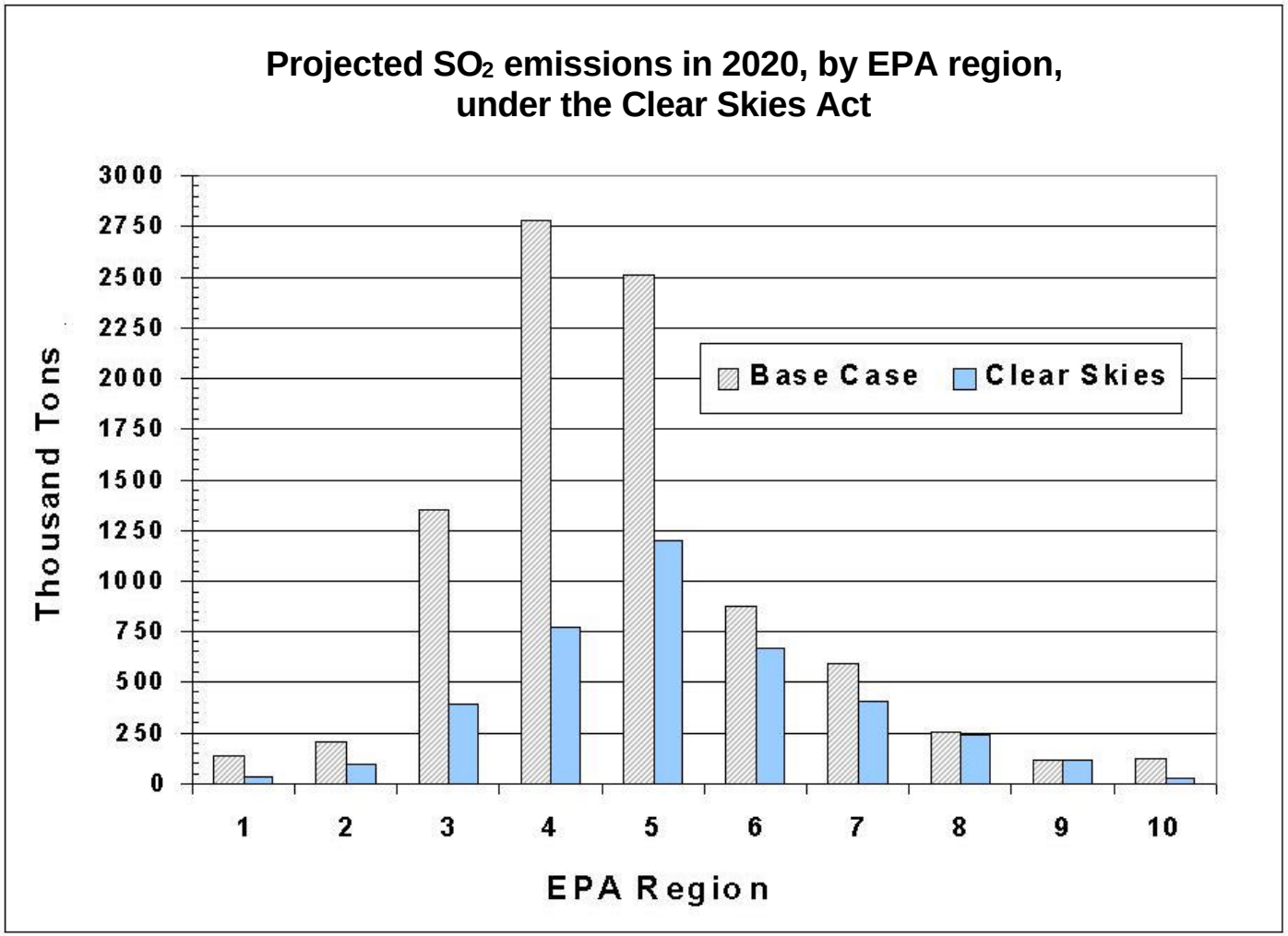
Note: Total emissions under the Base Case in 2010 would be 4.2 million tons; total emissions under Clear Skies in 2010 would be 2.1 million tons; total emissions under Clear Skies in 2020 would be 1.7 million tons. Emissions are from electric generating facilities greater than 25MW. The EPA 2000 Base Case in IPM includes Title IV, the NOx SIP Call, and state-specific caps in Connecticut, Missouri and Texas. The Base Case does not include any potential future regulations to implement the current CAA.

Emissions of Mercury



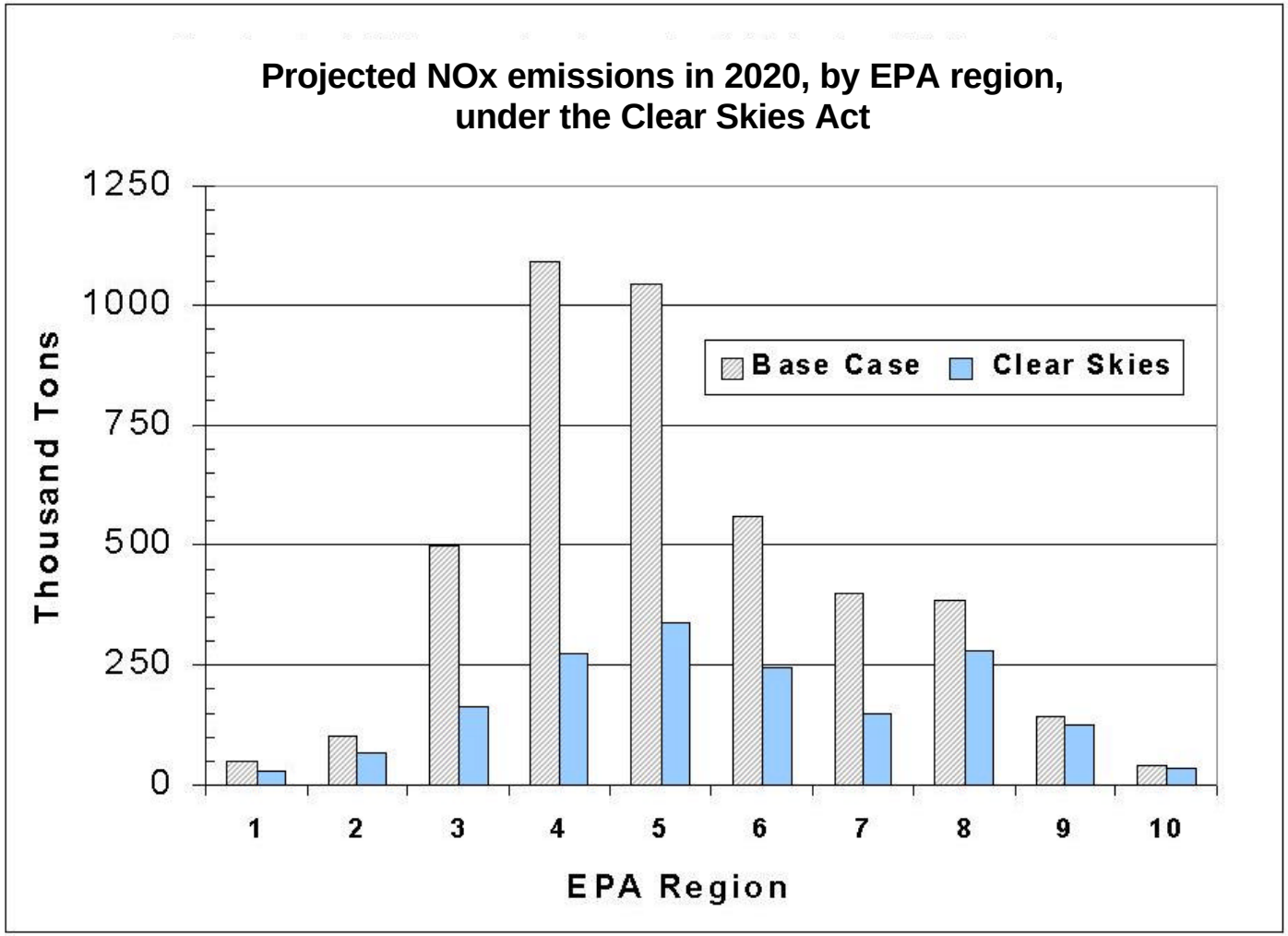
Note: Total emissions in 1999 were 48 tons; total emissions under Clear Skies in 2010 would be 26 tons; total emissions under Clear Skies in 2020 would be 18 tons. Emissions will continue to decline after 2020 until the cap level is reached. Emissions are from coal-fired electric generating facilities greater than 25MW.

Projected SO_2 Emissions from Power Plants



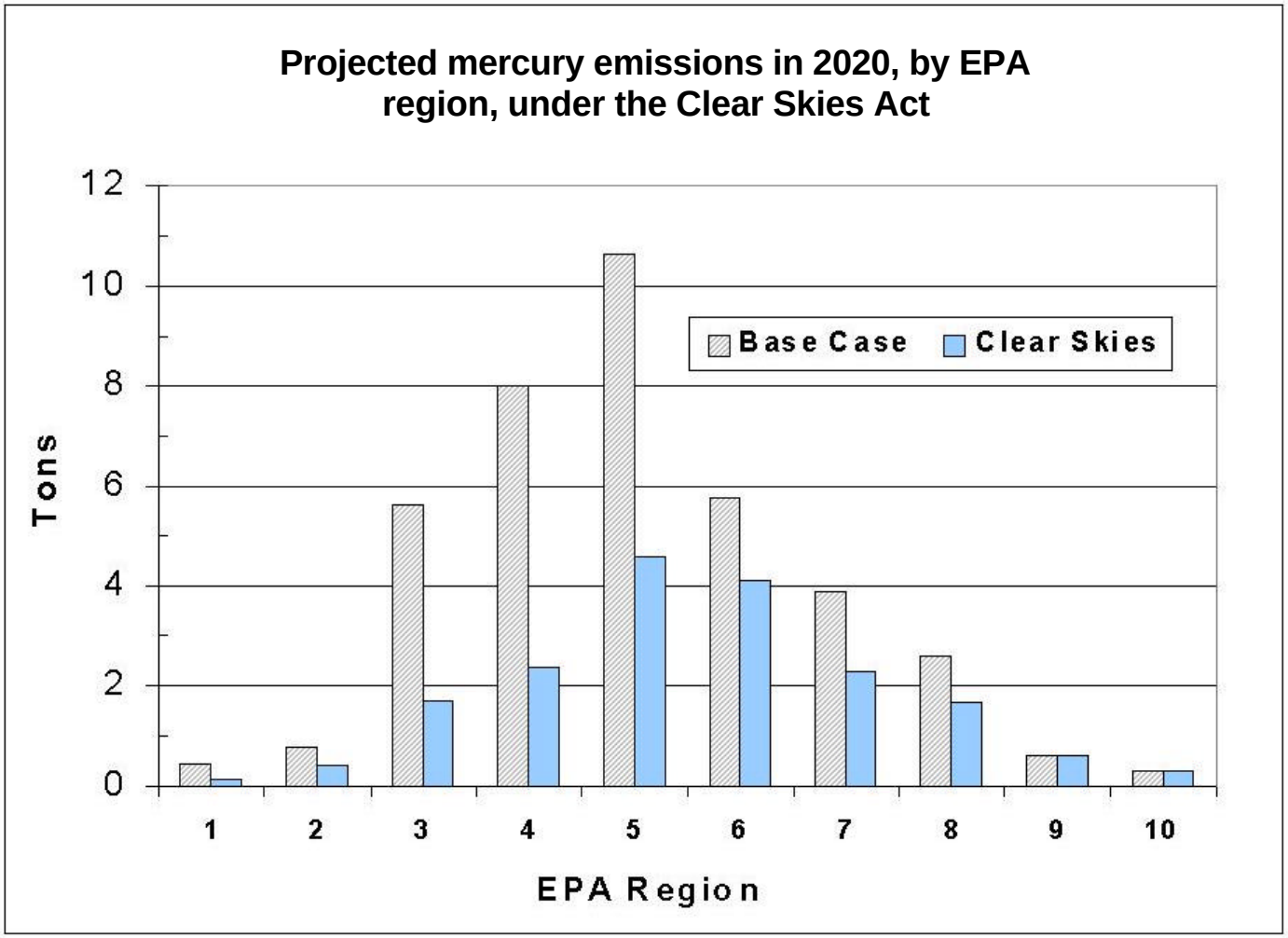
Note: The EPA 2000 Base Case in IPM includes Title IV, the NOx SIP Call, and state-specific caps in Connecticut, Missouri and Texas. The Base Case does not include any potential future regulations to implement the current CAA. Subsequent to the development of the latest version of the model used to project power plant emissions, SO_2 control equipment has been installed at the Centralia Plant in Washington. Since emission reductions from the installation of these controls were not included in the **base case** modeling, the amount of reductions expected under Clear Skies, as well as the benefits associated with those reductions, will be lower in the state of Washington (Region X) than projected.

Projected NOx Emissions from Power Plants



Note: The EPA 2000 Base Case in IPM includes Title IV, the NOx SIP Call, and state-specific caps in Connecticut, Missouri and Texas. The Base Case does not include any potential future regulations to implement the current CAA.

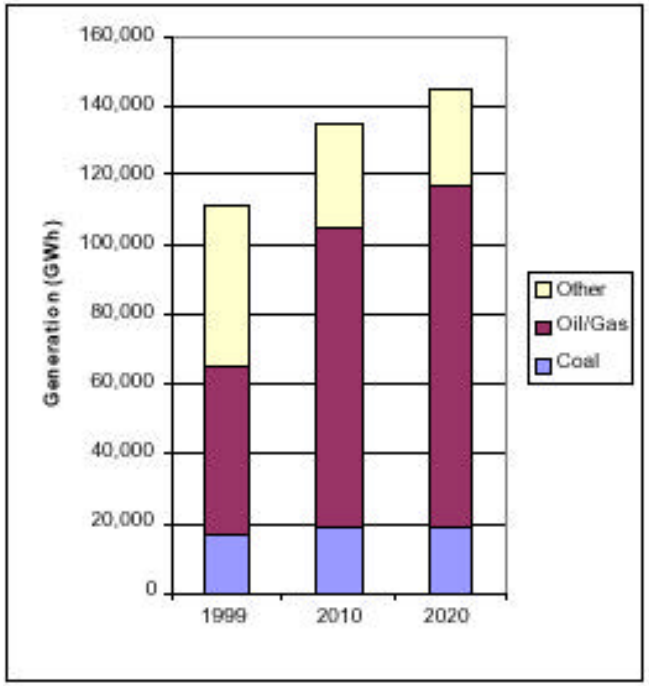
Projected Mercury Emissions from Power Plants



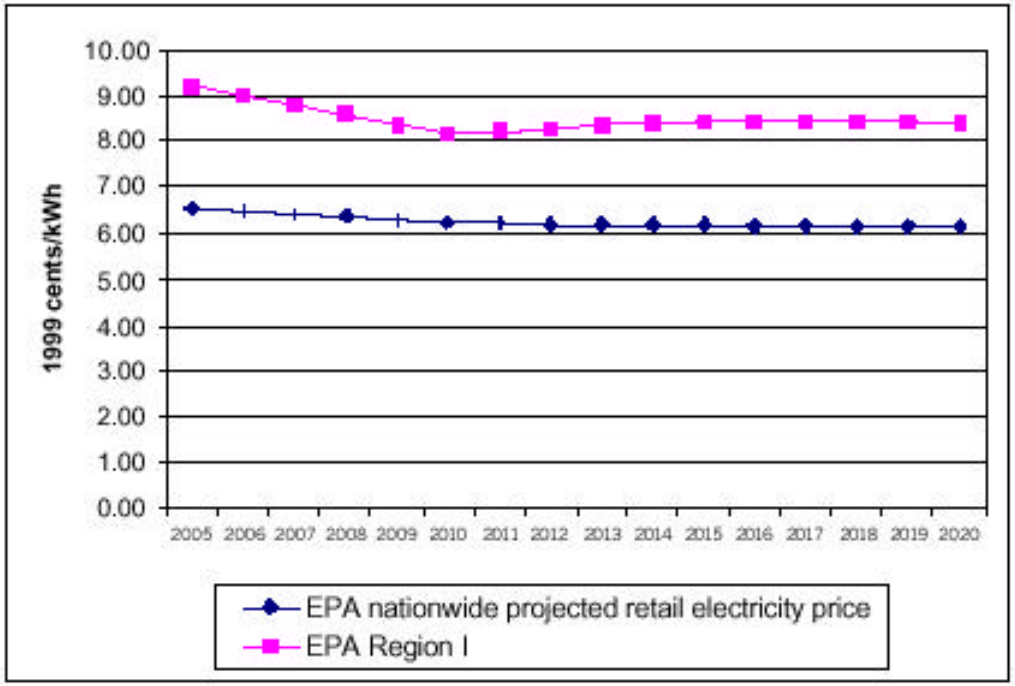
Note: The EPA 2000 Base Case in IPM includes Title IV, the NOx SIP Call, and state-specific caps in Connecticut, Missouri and Texas. The Base Case does not include any potential future regulations to implement the current CAA.

Summary of Projected Impacts in EPA Region I

Current Generation Mix and Projected Mix Under Clear Skies



Projected Retail Electricity Prices under Clear Skies (2005 - 2020)



Projected Emissions Rates from Power Generators

Year		SO_2	NOx			Hg
		Coal	All	Coal	Gas	Coal
	Units	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/TBtu
2010	Base Case	1.40	0.13	0.30	0.07	5.74
	Clear Skies	1.00	0.11	0.28	0.06	3.19
2020	Base Case	1.27	0.12	0.30	0.06	4.56
	Clear Skies	0.37	0.07	0.13	0.05	1.61

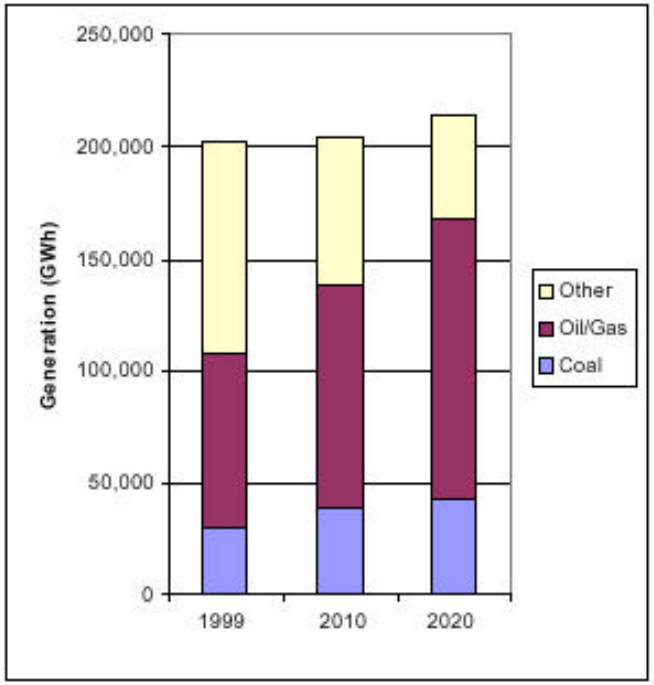
Note: Region I includes Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.

2020 generation projections are EPA estimates using IPM. 1999 generation from EIA, aggregated from state-level data at: www.eia.doe.gov/cneaf/electricity/st_profiles/ (Table 5).

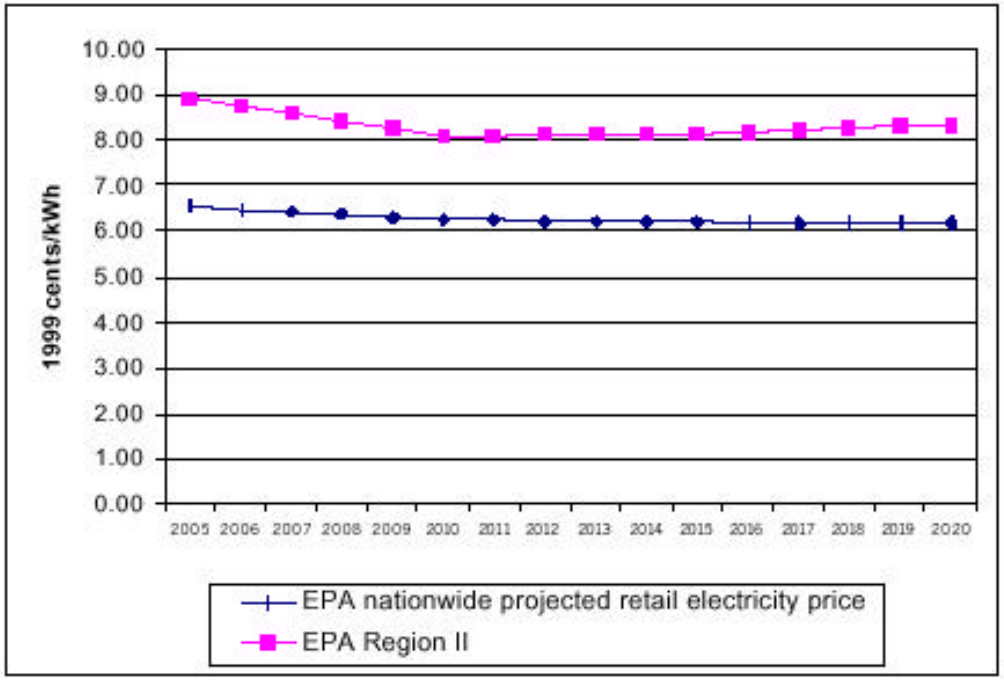
Electricity prices were calculated using the Retail Electricity Price Model (see Section G for a description of the Model).

Summary of Projected Impacts in EPA Region II

Current Generation Mix and Projected Mix Under Clear Skies



Projected Retail Electricity Prices under Clear Skies (2005 - 2020)



Projected Emissions Rates from Power Generators

Year		SO_2	NOx			Hg
		Coal	All	Coal	Gas	Coal
	Units	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/TBtu
2010	Base Case	1.42	0.18	0.42	0.05	8.62
	Clear Skies	0.89	0.14	0.32	0.05	3.30
2020	Base Case	1.03	0.17	0.42	0.05	3.98
	Clear Skies	0.47	0.11	0.24	0.05	2.05

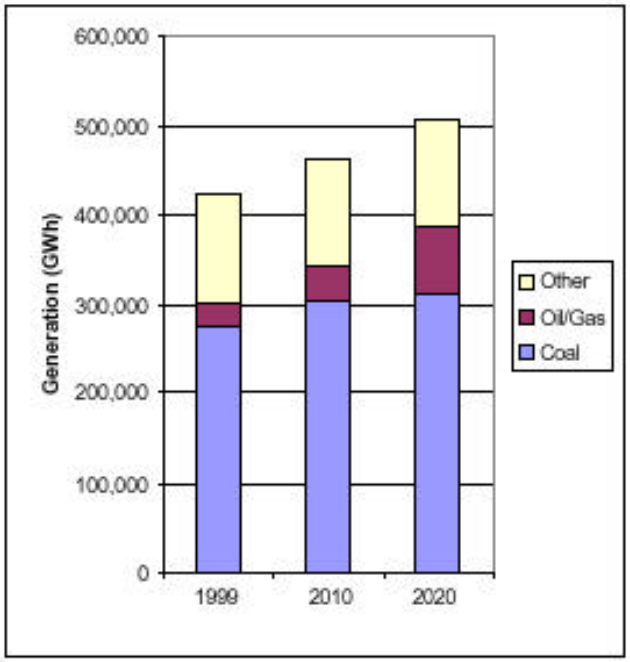
Note: Region II includes the states of New York and New Jersey.

2020 generation projections are EPA estimates using IPM. 1999 generation data from EIA, aggregated from state-level data at: www.eia.doe.gov/cneaf/electricity/st_profiles/ (Table 5).

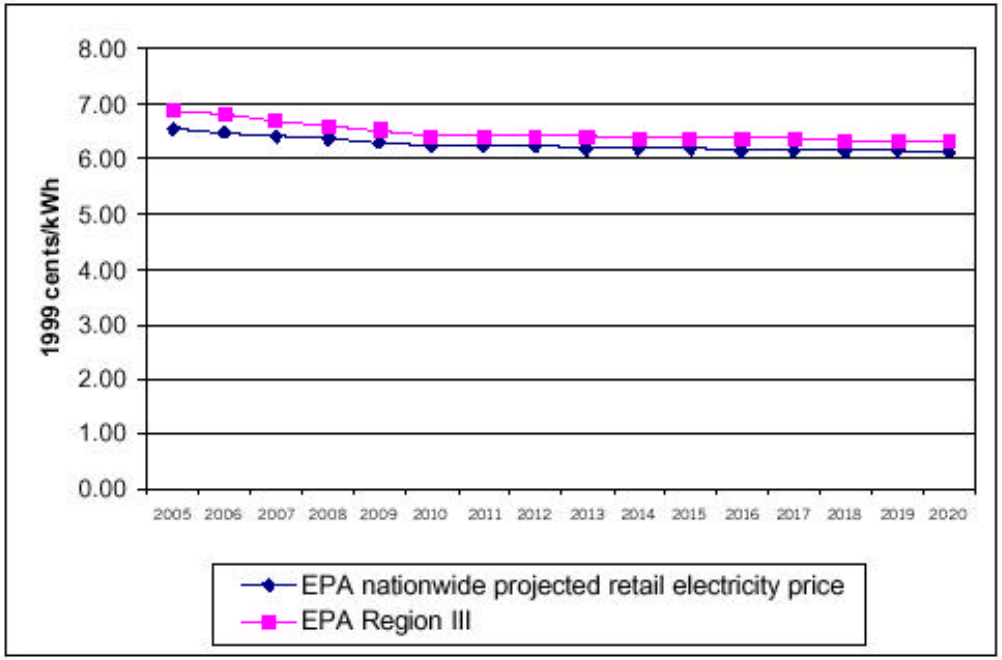
Electricity prices were calculated using the Retail Electricity Price Model (see Section G for a description of the Model).

Summary of Projected Impacts in EPA Region III

Current Generation Mix and Projected Mix Under Clear Skies



Projected Retail Electricity Prices under Clear Skies (2005 - 2020)



Projected Emissions Rates from Power Generators

Year		SO_2	NOx			Hg
		Coal	All	Coal	Gas	Coal
	Units	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/TBtu
2010	Base Case	1.04	0.30	0.31	0.09	4.40
	Clear Skies	0.57	0.12	0.13	0.09	1.99
2020	Base Case	0.89	0.28	0.31	0.08	3.69
	Clear Skies	0.26	0.09	0.10	0.07	1.14

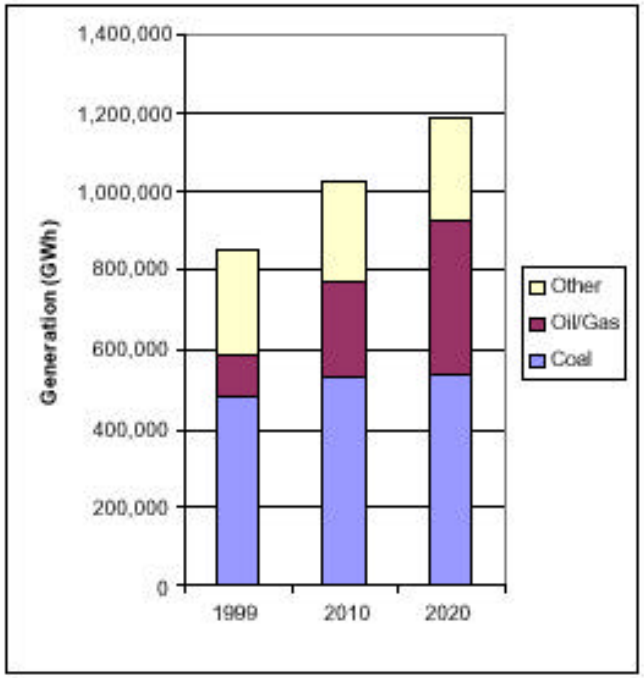
Note: Region III includes Delaware, the District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia.

2020 generation projections are EPA estimates using IPM. 1999 generation from EIA, aggregated from state-level data at: www.eia.doe.gov/cneaf/electricity/st_profiles/ (Table 5).

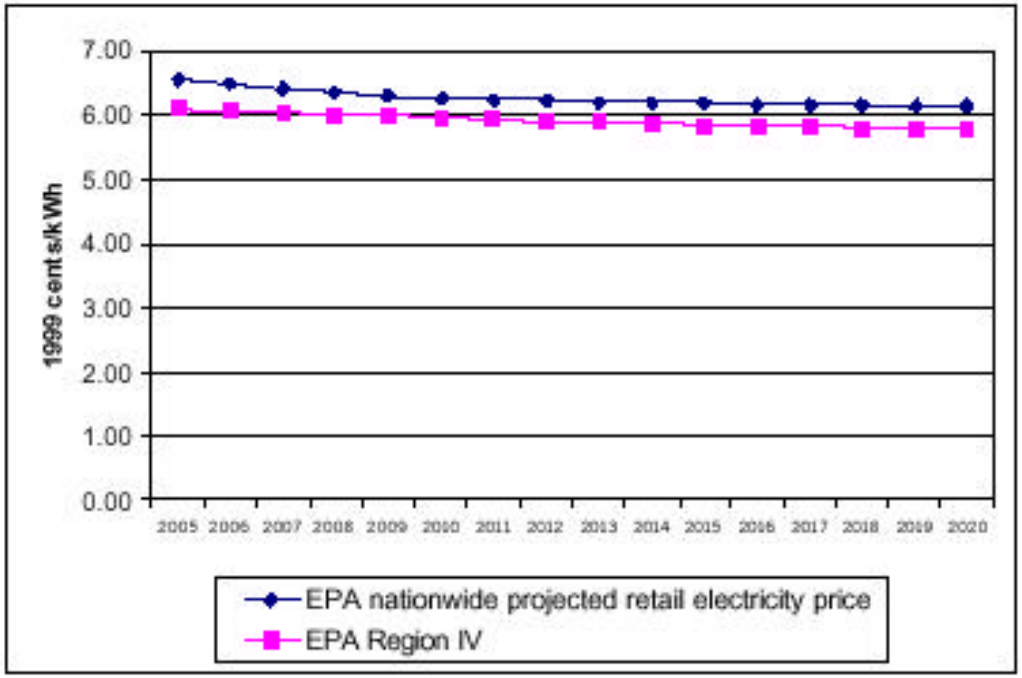
Electricity prices were calculated using the Retail Electricity Price Model (see Section G for a description of the Model).

Summary of Projected Impacts in EPA Region IV

Current Generation Mix and Projected Mix Under Clear Skies



Projected Retail Electricity Prices under Clear Skies (2005 - 2020)



Projected Emissions Rates from Power Generators

Year		SO_2	NOx			Hg
		Coal	All	Coal	Gas	Coal
	Units	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/TBtu
2010	Base Case	0.99	0.31	0.38	0.07	2.85
	Clear Skies	0.83	0.11	0.13	0.05	2.06
2020	Base Case	0.99	0.27	0.37	0.05	2.85
	Clear Skies	0.29	0.07	0.08	0.04	0.91

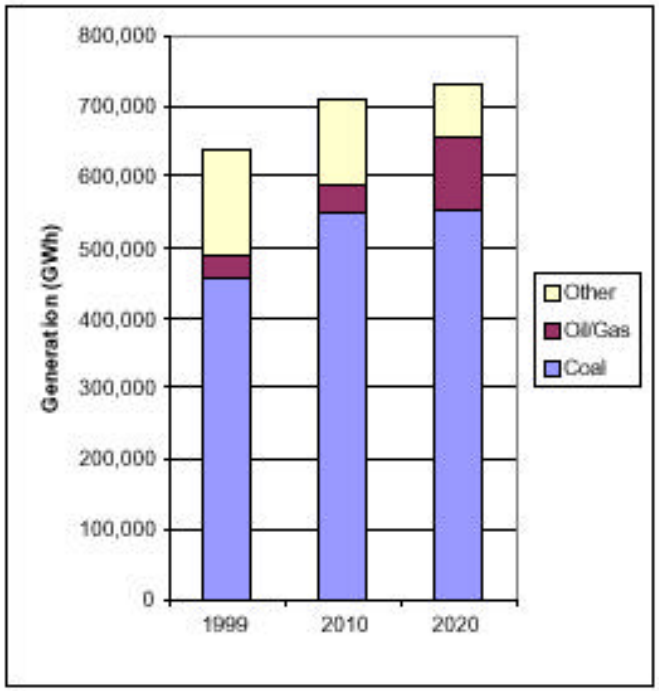
Note: Region IV includes Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina and Tennessee.

2020 generation projections are EPA estimates using IPM. 1999 generation from EIA, aggregated from state-level data at: www.eia.doe.gov/cneaf/electricity/st_profiles/ (Table 5).

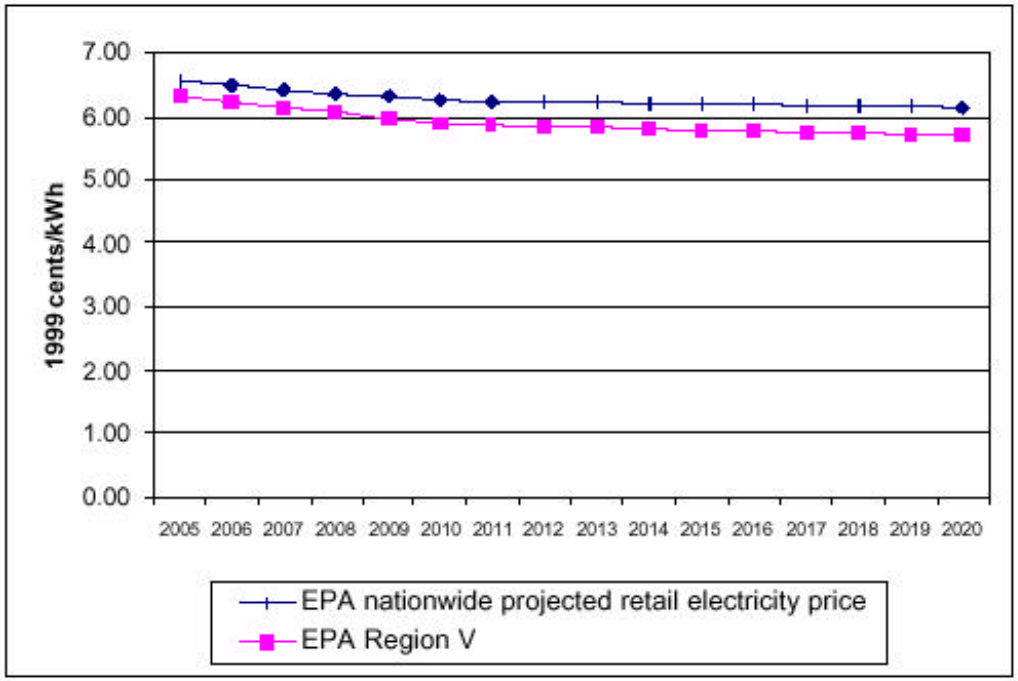
Electricity prices were calculated using the Retail Electricity Price Model (see Section G for a description of the Model).

Summary of Projected Impacts in EPA Region V

Current Generation Mix and Projected Mix Under Clear Skies



Projected Retail Electricity Prices under Clear Skies (2005 - 2020)



Projected Emissions Rates from Power Generators

Year		SO_2	NOx			Hg
		Coal	All	Coal	Gas	Coal
	Units	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/TBtu
2010	Base Case	0.99	0.35	0.36	0.12	4.00
	Clear Skies	0.62	0.16	0.17	0.11	2.44
2020	Base Case	0.88	0.33	0.36	0.11	3.74
	Clear Skies	0.45	0.11	0.11	0.09	1.71

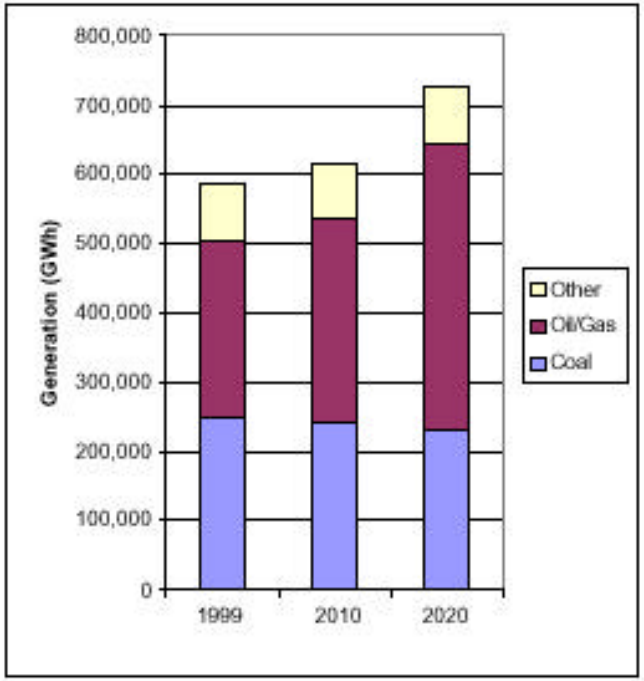
Note: Region V includes Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

2020 generation projections are EPA estimates using IPM. 1999 generation from EIA, aggregated from state-level data at: www.eia.doe.gov/cneaf/electricity/st_profiles/ (Table 5).

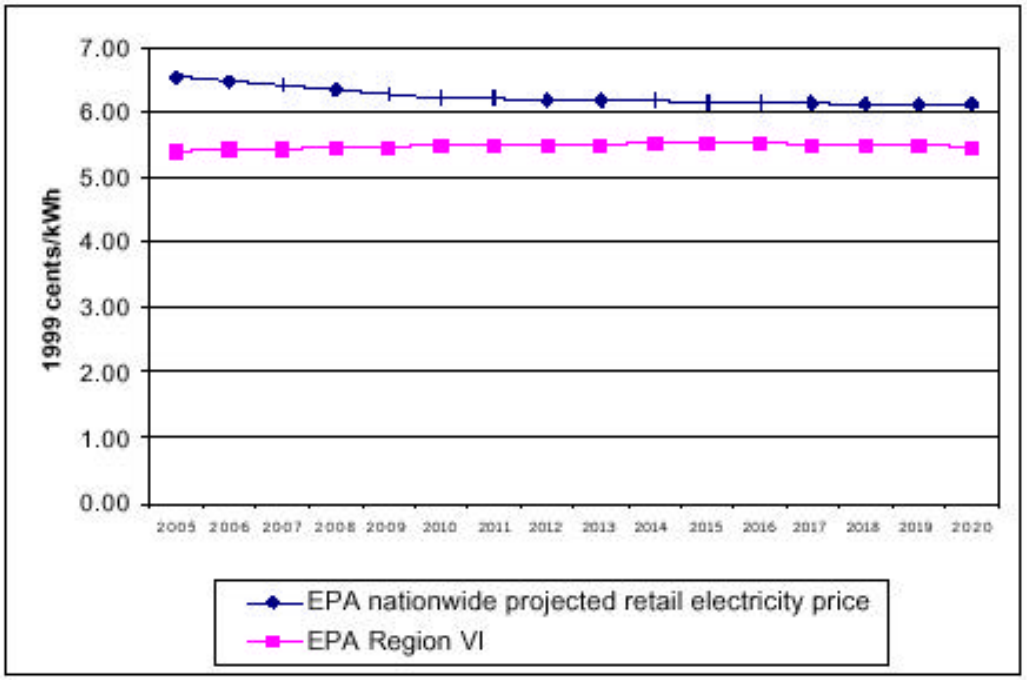
Electricity prices were calculated using the Retail Electricity Price Model (see Section G for a description of the Model).

Summary of Projected Impacts in EPA Region VI

Current Generation Mix and Projected Mix Under Clear Skies



Projected Retail Electricity Prices under Clear Skies (2005 - 2020)



Projected Emissions Rates from Power Generators

Year		SO_2	NOx			Hg
		Coal	All	Coal	Gas	Coal
	Units	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/TBtu
2010	Base Case	0.80	0.23	0.29	0.15	4.23
	Clear Skies	0.63	0.15	0.19	0.12	3.60
2020	Base Case	0.65	0.20	0.30	0.10	4.27
	Clear Skies	0.56	0.10	0.11	0.08	3.44

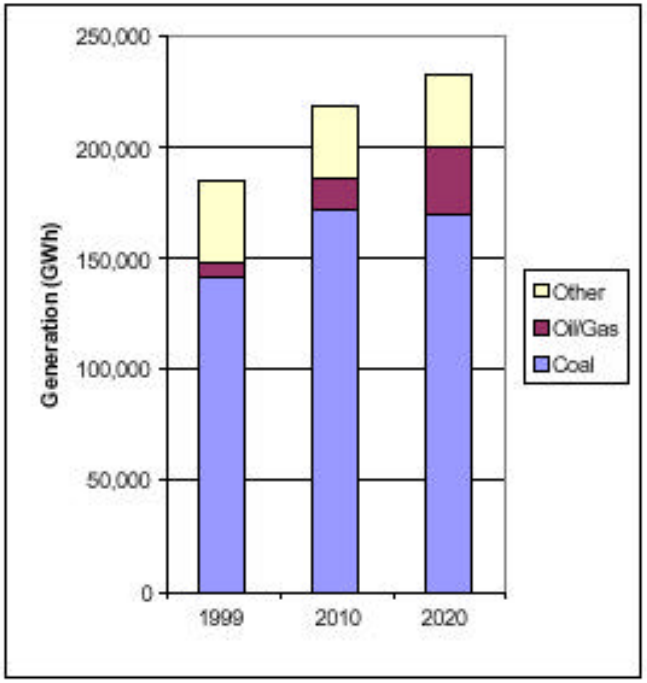
Note: Region VI includes Arkansas, Louisiana, New Mexico, Oklahoma, and Texas.

2020 generation projections are EPA estimates using IPM. 1999 generation from EIA, aggregated from state-level data at: www.eia.doe.gov/cneaf/electricity/st_profiles/ (Table 5).

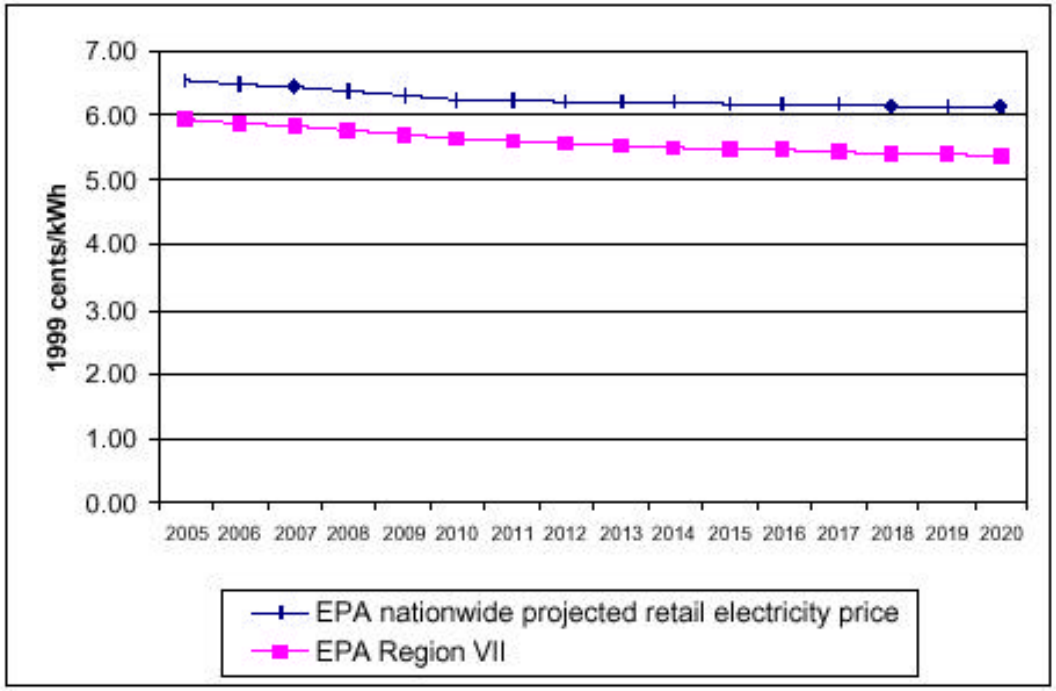
Electricity prices were calculated using the Retail Electricity Price Model (see Section G for a description of the Model).

Summary of Projected Impacts in EPA Region VII

Current Generation Mix and Projected Mix Under Clear Skies



Projected Retail Electricity Prices under Clear Skies (2005 - 2020)



Projected Emissions Rates from Power Generators

Year		SO_2	NOx			Hg
		Coal	All	Coal	Gas	Coal
	Units	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/TBtu
2010	Base Case	0.63	0.40	0.41	0.10	4.14
	Clear Skies	0.56	0.19	0.20	0.08	3.21
2020	Base Case	0.62	0.37	0.41	0.10	4.12
	Clear Skies	0.46	0.15	0.16	0.07	2.61

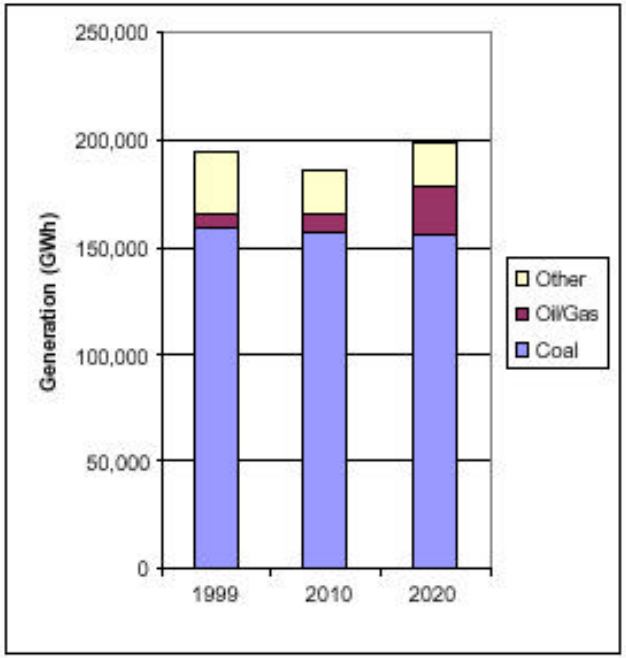
Note: Region VII includes Iowa, Kansas, Missouri, and Nebraska.

2020 generation projections are EPA estimates using IPM. 1999 generation from EIA, aggregated from state-level data at: www.eia.doe.gov/cneaf/electricity/st_profiles/ (Table 5).

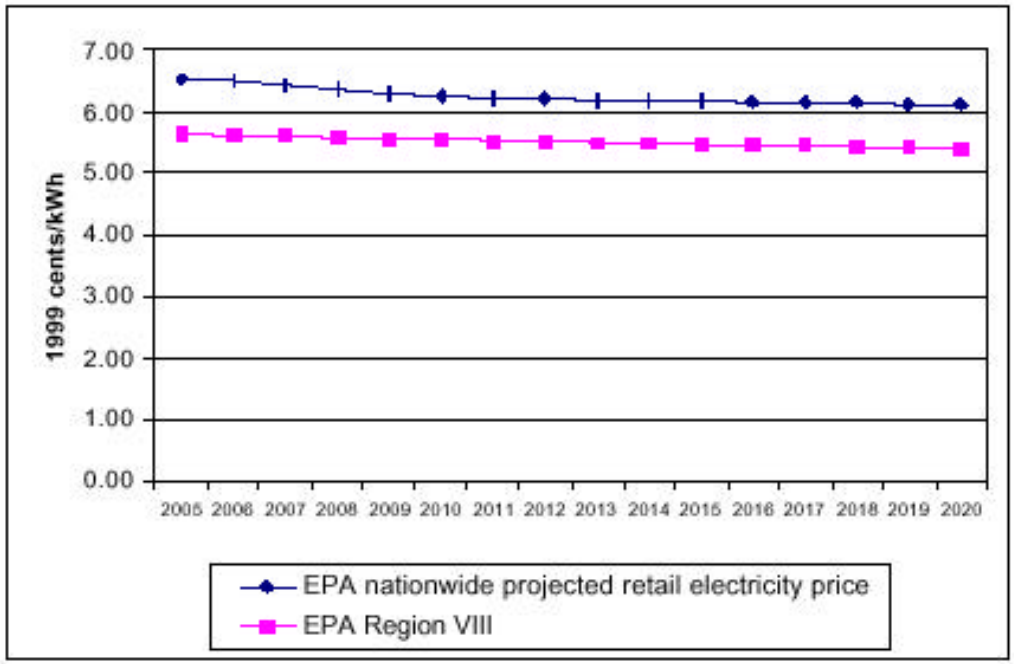
Electricity prices were calculated using the Retail Electricity Price Model (see Section G for a description of the Model).

Summary of Projected Impacts in EPA Region VIII

Current Generation Mix and Projected Mix Under Clear Skies



Projected Retail Electricity Prices under Clear Skies (2005 - 2020)



Projected Emissions Rates from Power Generators

Year		SO_2	NOx			Hg
		Coal	All	Coal	Gas	Coal
	Units	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/TBtu
2010	Base Case	0.38	0.45	0.46	0.11	3.19
	Clear Skies	0.30	0.33	0.34	0.09	2.38
2020	Base Case	0.31	0.43	0.46	0.08	3.15
	Clear Skies	0.30	0.32	0.34	0.06	2.04

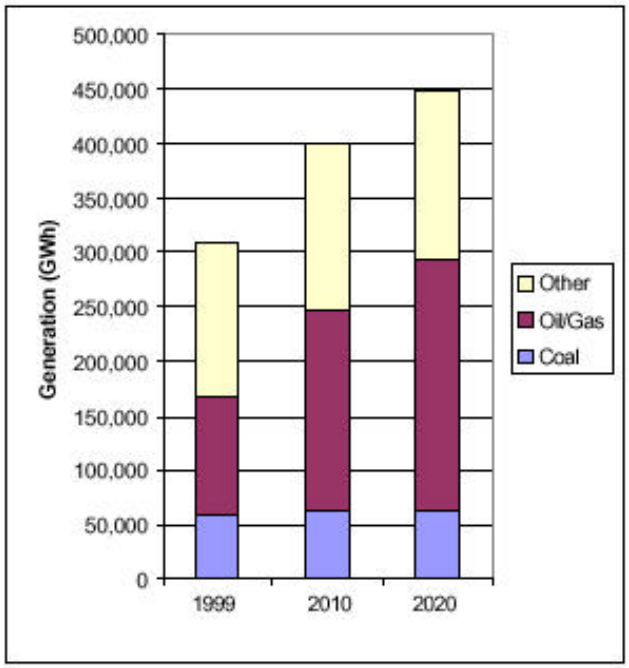
Note: Region VIII includes Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

2020 generation projections are EPA estimates using IPM. 1999 generation from EIA, aggregated from state-level data at: www.eia.doe.gov/cneaf/electricity/st_profiles/ (Table 5).

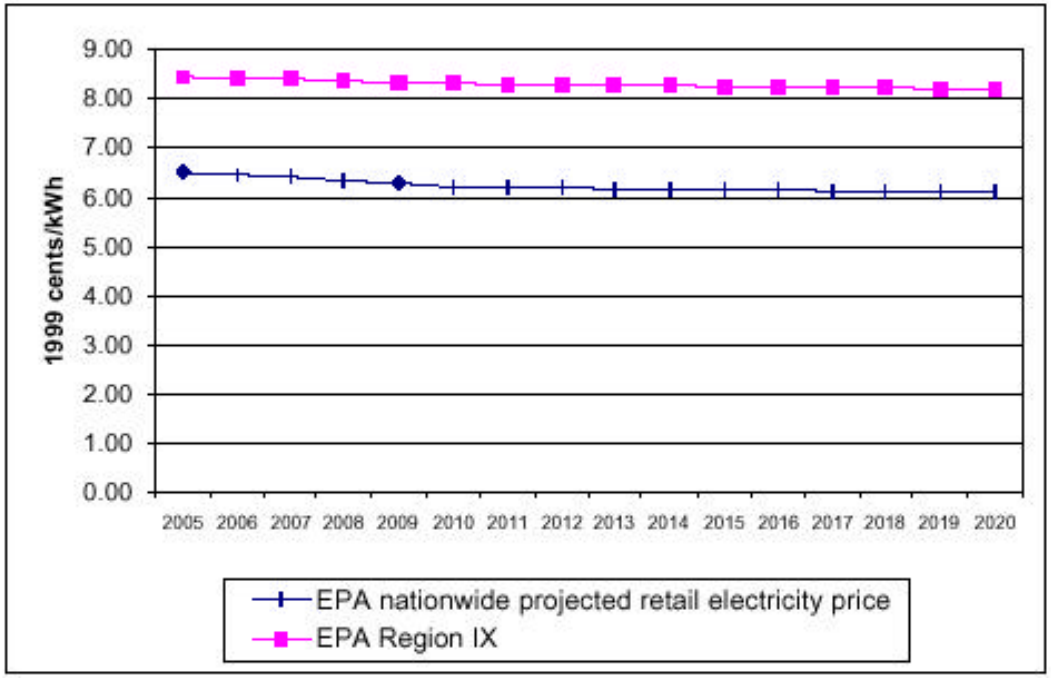
Electricity prices were calculated using the Retail Electricity Price Model (see Section G for a description of the Model).

Summary of Projected Impacts in EPA Region IX

Current Generation Mix and Projected Mix Under Clear Skies



Projected Retail Electricity Prices under Clear Skies (2005 - 2020)



Projected Emissions Rates from Power Generators

Year		SO_2	NOx			Hg
		Coal	All	Coal	Gas	Coal
	Units	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/TBtu
2010	Base Case	0.37	0.15	0.40	0.04	1.97
	Clear Skies	0.37	0.13	0.34	0.03	1.98
2020	Base Case	0.37	0.15	0.40	0.03	2.00
	Clear Skies	0.37	0.12	0.34	0.03	1.98

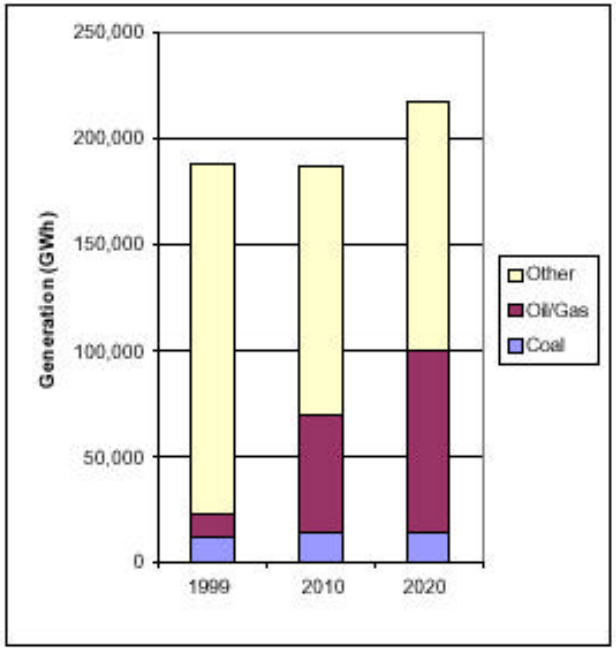
Note: Region IX includes Arizona, California and Nevada.

2020 generation projections are EPA estimates using IPM. 1999 generation from EIA, aggregated from state-level data at: www.eia.doe.gov/cneaf/electricity/st_profiles/ (Table 5).

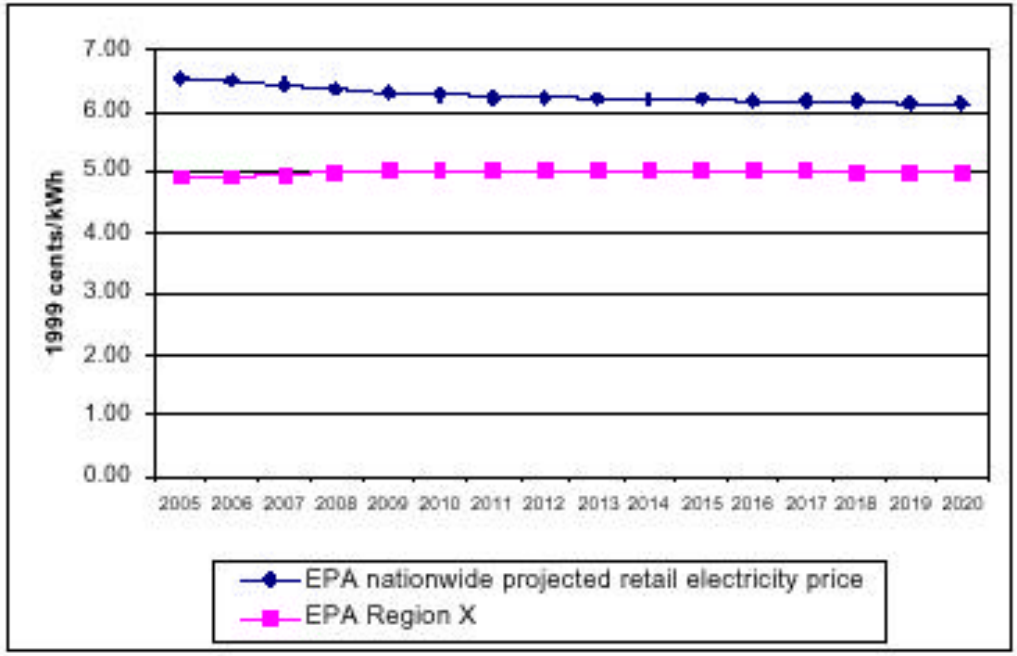
Electricity prices were calculated using the Retail Electricity Price Model (see Section G for a description of the Model).

Summary of Projected Impacts in EPA Region X

Current Generation Mix and Projected Mix Under Clear Skies



Projected Retail Electricity Prices under Clear Skies (2005 - 2020)



Projected Emissions Rates from Power Generators

Year		SO_2	NOx			Hg
		Coal	All	Coal	Gas	Coal
	Units	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/TBtu
2010	Base Case	1.71	0.16	0.41	0.07	4.46
	Clear Skies	0.36	0.13	0.33	0.06	4.46
2020	Base Case	1.71	0.11	0.41	0.04	4.46
	Clear Skies	0.36	0.10	0.33	0.04	4.46

Note: Region X includes Idaho, Oregon, Washington.

2020 generation projections are EPA estimates using IPM. 1999 generation from EIA, aggregated from state-level data at: www.eia.doe.gov/cneaf/electricity/st_profiles/ (Table 5).

Electricity prices were calculated using the Retail Electricity Price Model (see Section G for a description of the Model).

Subsequent to the development of the latest version of the model used to project power plant emissions, SO_2 control equipment has been installed at the Centralia Plant in Washington. Since emission reductions from the installation of these controls were not included in the **base case** modeling, the amount of reductions expected under Clear Skies, as well as the benefits associated with those reductions, will be lower in the state of Washington than projected.

Projected State Generation Mix in 2010

Note: "Other" includes generation from nuclear, hydroelectric, biomass, geothermal, landfill gas, wind, and solar sources.

	% Coal	% Natural Gas	% Other
Alabama	49%	26%	25%
Arizona	34%	33%	34%
Arkansas	47%	15%	38%
Califiornia	2%	54%	44%
Colorado	84%	12%	4%
Connecticut	10%	85%	6%
Delaware	42%	58%	0%
District of Columbiia	0%	100%	0%
Florida	39%	45%	16%
Georgia	47%	33%	21%
Idaho	0%	37%	63%
Illiinoiis	59%	11%	30%
Indiiana	98%	2%	0%
Iowa	83%	6%	11%
Kansas	78%	1%	20%
Kentucky	91%	6%	3%
Louiisiiana	34%	41%	25%
Maiine	5%	74%	21%
Maryland	58%	10%	32%
Massachusettts	23%	71%	6%
Miichiigan	69%	8%	24%
Miinnesota	64%	6%	30%
Miissiissiippi	30%	51%	19%
Miissouri	79%	9%	12%
Montana	62%	5%	34%
Nebraska	73%	6%	21%
Nevada	57%	31%	12%
New Hampshiire	12%	21%	67%
New Jersey	24%	55%	21%
New Mexico	74%	25%	1%
New York	18%	47%	36%
North Caroliina	67%	3%	31%
North Dakota	90%	4%	6%
Ohio	89%	1%	10%
Oklahoma	54%	42%	4%
Oregon	6%	37%	57%
Pennsylvania	59%	7%	34%
Rhode Island	0%	100%	0%
South Caroliina	39%	6%	55%
South Dakota	35%	8%	57%
Tennessee	47%	19%	35%
Texas	33%	56%	11%
Utah	97%	0%	3%
Vermont	0%	3%	97%
Viirgiinia	48%	8%	43%
Washiington	9%	26%	66%
West Viirginia	99%	0%	1%
Wiisconsiin	78%	12%	11%
Wyoming	98%	0%	2%
National	50%	26%	24%

Projected Retrofits By State in 2010 and 2020

	Cumulative Coal-Capacity Retrofitted by 2010 (MW)			Cumulative Coal-Capacity Retrofitted by 2020 (MW)		
	SCR	Scrubber	ACI	SCR	Scrubber	ACI
Alabama	9,000	2,700	0	9,700	8,300	0
Arkansas	800	0	0	3,800	1,300	0
Connecticut	400	0	0	400	600	0
Delaware	0	0	0	0	400	0
Florida	6,900	2,700	0	7,500	4,200	0
Georgia	9,900	7,400	0	11,900	11,900	0
Illinois	6,500	5,400	0	8,600	6,800	0
Indiana	14,900	5,500	0	15,800	9,200	0
Iowa	2,300	0	0	3,400	1,300	0
Kansas	3,200	0	0	4,200	0	0
Kentucky	10,700	900	0	12,000	4,700	300
Louisiana	700	0	0	2,900	500	0
Maryland	2,500	2,900	0	3,000	4,400	0
Massachusetts	0	0	0	1,200	1,200	0
Michigan	4,400	0	0	6,900	1,900	0
Minnesota	2,200	0	0	4,400	0	900
Mississippi	1,400	900	0	2,200	1,800	0
Missouri	4,100	0	0	4,600	600	0
New Hampshire	0	300	0	0	300	0
New Jersey	0	0	0	400	1,700	0
New Mexico	1,800	0	0	1,800	0	0
New York	700	400	0	1,400	800	0
North Carolina	8,800	0	0	10,300	9,800	0
North Dakota	1,100	900	400	1,100	1,000	1,300
Ohio	15,600	7,900	0	18,500	12,700	0
Oklahoma	4,400	0	0	4,400	0	0
Pennsylvania	9,800	5,800	0	11,900	9,100	0
South Carolina	3,900	0	0	4,100	1,900	0
South Dakota	400	400	0	400	400	0
Tennessee	3,800	0	0	4,700	2,300	0
Texas	9,300	2,000	0	13,900	2,200	0
Virginia	900	0	0	2,100	2,200	0
Washington	0	1,200	0	0	1,300	0
West Virginia	12,200	4,100	0	12,200	8,800	0
Wisconsin	300	0	0	3,800	800	0
Grand Total	152,900	51,400	400	193,500	114,400	2,500

Note: Table includes retrofits in response to the NOx SIP call and Title IV, as well as Clear Skies.

SCR = Selective Catalytic Reduction

ACI = Activated Carbon Injection

Projected Retail Electricity Prices under Clear Skies

- In 1999, the national average retail electricity price was 6.66 cents/kWh.

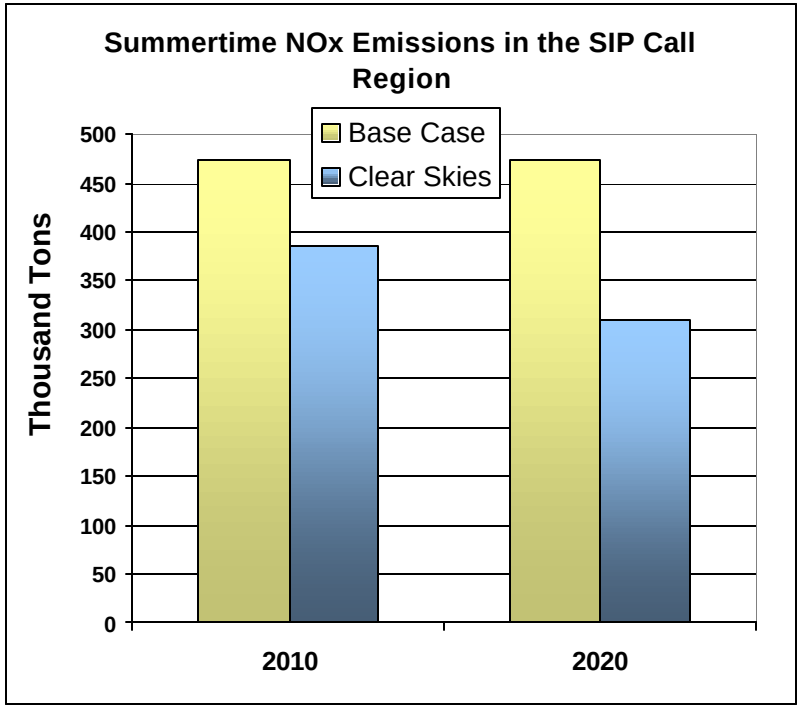
Projected Retail Electricity Prices (1999 cents per kilowatt hour)					
NERC Region*	**States Included**	**2005**	**2010**	**2015**	**2020**
ECAR	OH, MI, IN, KY, WV, PA	6.19	5.78	5.72	5.64
ERCOT	TX	4.95	5.36	5.52	5.47
MAAC	PA, NJ, MD, DC, DE	7.75	7.09	7.10	7.05
MAIN	IL, MR, WI	6.72	6.15	6.02	5.96
MAPP	MN, IA, SD, ND, NE	5.48	5.46	5.21	5.01
NY	NY	9.39	8.52	8.59	8.89
NE	VT, NH, ME, MA, CT, RI	9.24	8.18	8.48	8.43
FRCC	FL	7.04	6.94	6.83	6.69
STV	VA, NC, SC, GA, AL, MS, TN, AR, LA	5.79	5.65	5.53	5.52
SPP	KS, OK, MR	5.97	5.55	5.44	5.38
PNW	WA, OR, ID	4.90	5.02	5.01	4.98
RM	MT, WY, CO, UT, NM, AZ, NV, ID	6.79	6.32	6.27	6.25
CALI	CA	9.39	9.35	9.29	9.22
Lower 48 States		6.54	6.24	6.18	6.13

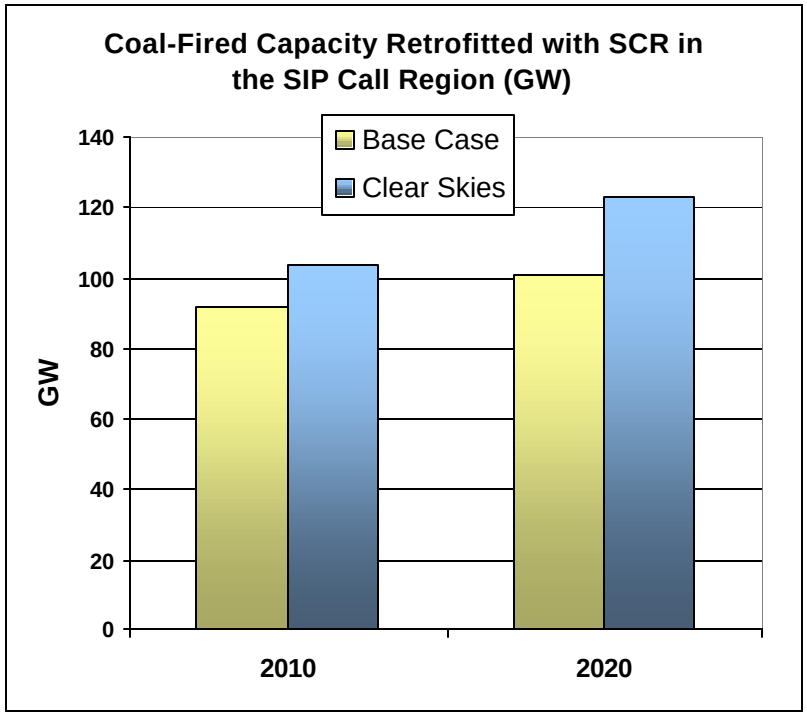
Note: Information on the North American Electric Reliability Council (NERC) is available at http:// www.nerc.com.

1999 national average electricity retail price: EIA at http://www.eia.doe.gov/cneaf/electricity/page/fact_sheets/retailprice.html.
2005 - 2020 projections: from the "Retail Electricity Price Model" (see section G for a description of the Model.)

Impact of Clear Skies on the NOx SIP Call Region

- Summertime NOx emissions in the SIP Call region under Clear Skies are significantly lower than the emissions projected under the NOx SIP Call. The additional reductions under Clear Skies come from the approximately 23 GW of additional SCR retrofits by 2020.





Note: The NOx SIP call region includes nineteen Eastern states and DC. Summertime emissions occur between May 1 and September 30.