

West Virginia Energy Statistics 2000 - 2009/2010



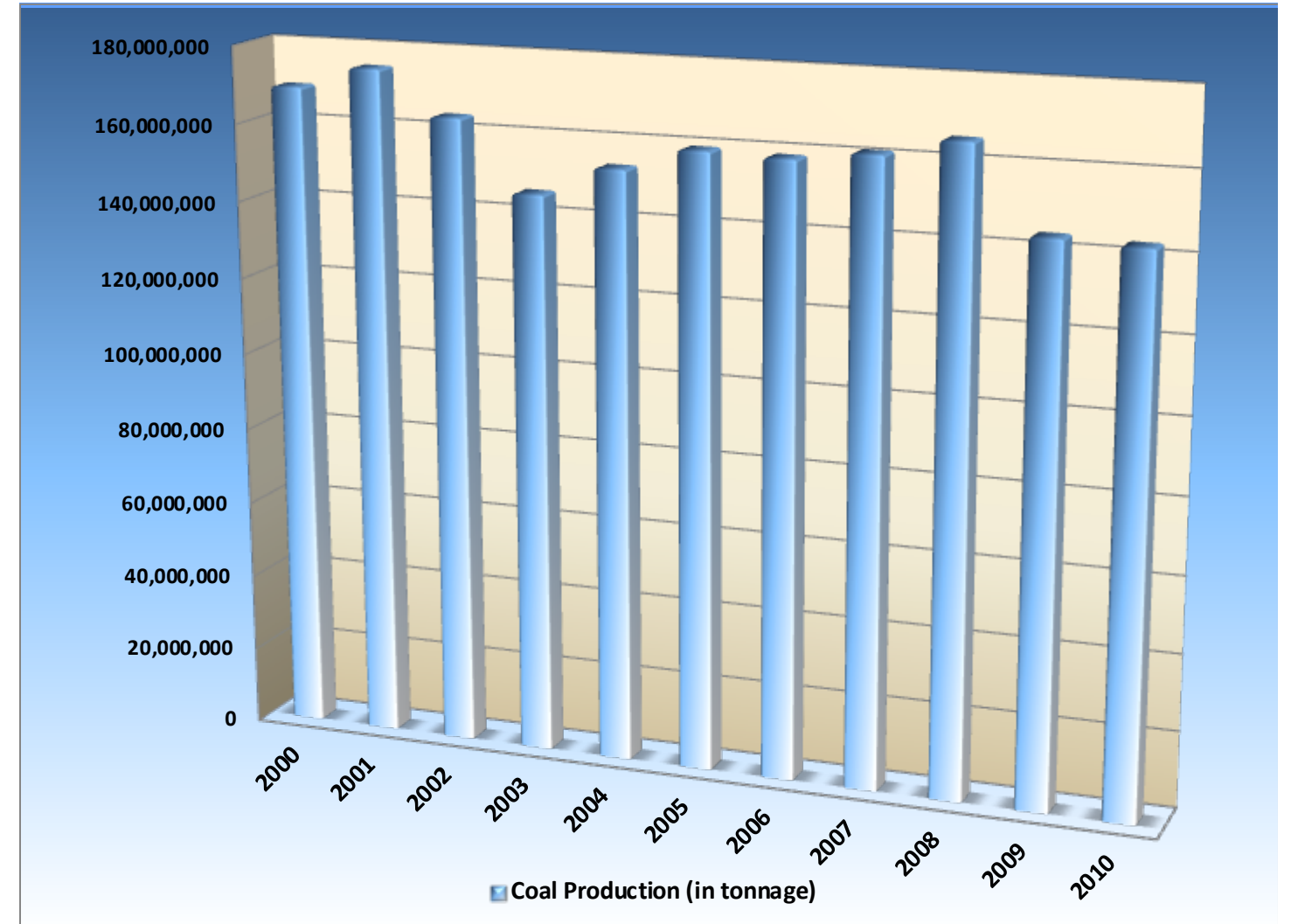
Compiled by:
Marshall University
Center for Business and Economic Research

Compiled For:
WV Division of Energy

Chapter 1: Energy Production

Coal (Tons)

2000 - 2010



Coal Production (in tonnage)

2000	169,370,602
2001	175,052,857
2002	163,896,890
2003	145,899,599
2004	153,631,633
2005	159,498,069
2006	158,835,584
2007	161,237,538
2008	165,750,817
2009	144,017,758
2010	143,247,932

The large majority of coal production in West Virginia is directly tied to electricity production. In 2009, about 86 percent of coal produced in the state was distributed for electricity production. Historically, coal has provided about 50 percent of electricity in the U.S. but that share has declined somewhat as natural gas has become a more competitive fuel.

As a storable commodity, coal production trends also reflect changes in stockpiles such as the increases experienced in 2009 with reduced electricity demand. 2010 production was the lowest seen since 1993, reflecting lower demand from power plants due to a combination of reduced electricity demand, larger coal stockpiles and competition from natural gas-fueled power producers. Non-market factors such as increased regulatory scrutiny of mine operations have also impacted production.

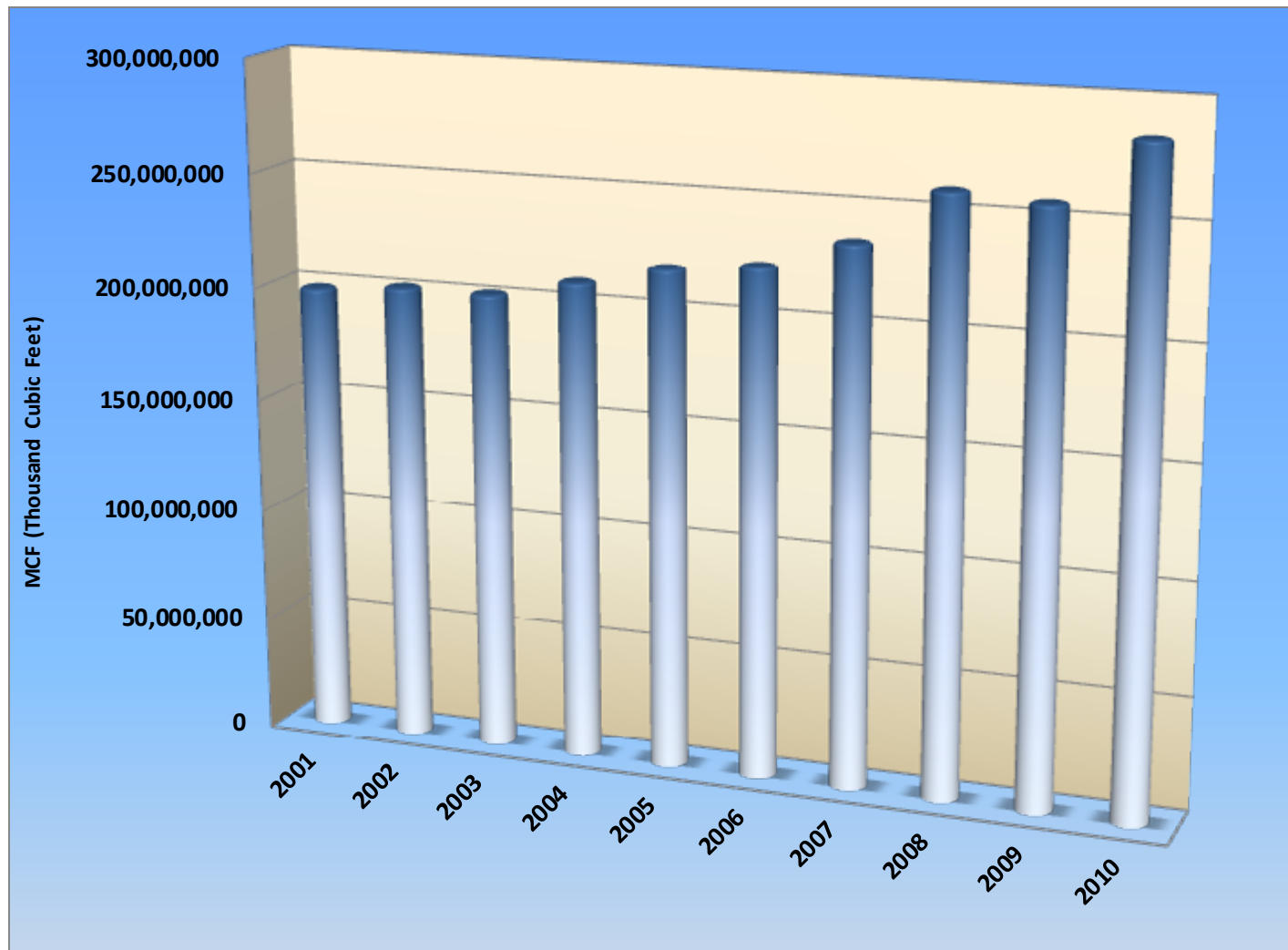
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Production

Natural Gas mcf (Thousand Cubic Feet)

2001 - 2010



mcf (Thousand Cubic Feet)

2001	198,983,718
2002	202,130,029
2003	202,290,182
2004	210,478,567
2005	219,411,397
2006	223,200,593
2007	235,853,451
2008	259,665,182
2009	257,177,563
2010	285,379,375

Except for 2009, natural gas production in West Virginia has increased each year since 2000, with total 2009 production 54 percent more than 2000. The state is part of a regional gas producing, consuming and transporting region that extends from the dominant production zone in and around Texas to the large consuming zones of the northeastern U.S. West Virginia produces about twice as much gas as is demanded by its residents and businesses. The rest is delivered to neighboring states to the east and northeast.

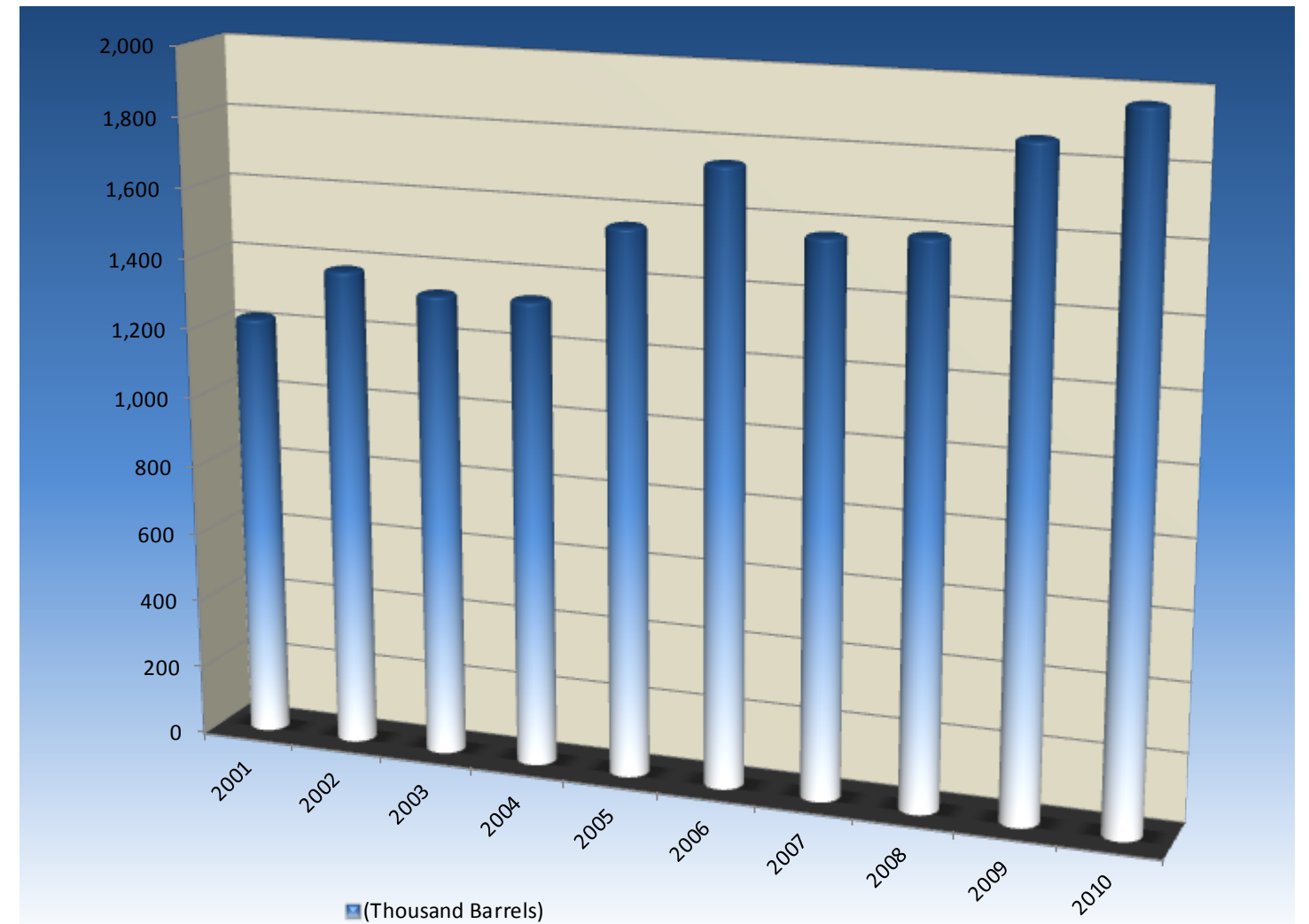
Nationally, demand for natural gas by households, commercial buildings and manufacturing industries has been fairly constant over the last decade. Most new demand has been for power generation.

Gas produced from the Marcellus Shale has risen to about 12 percent or more of total gas production in 2009 from less than one percent in 2005. This share is expected to rise as more wells are completed.

Production

Crude Oil (Thousand Barrels)

2001 - 2010



(Thousand Barrels)

(Thousand Barrels)

2001	1,226
2002	1,382
2003	1,334
2004	1,339
2005	1,563
2006	1,749
2007	1,574
2008	1,593
2009	1,864
2010	1,967

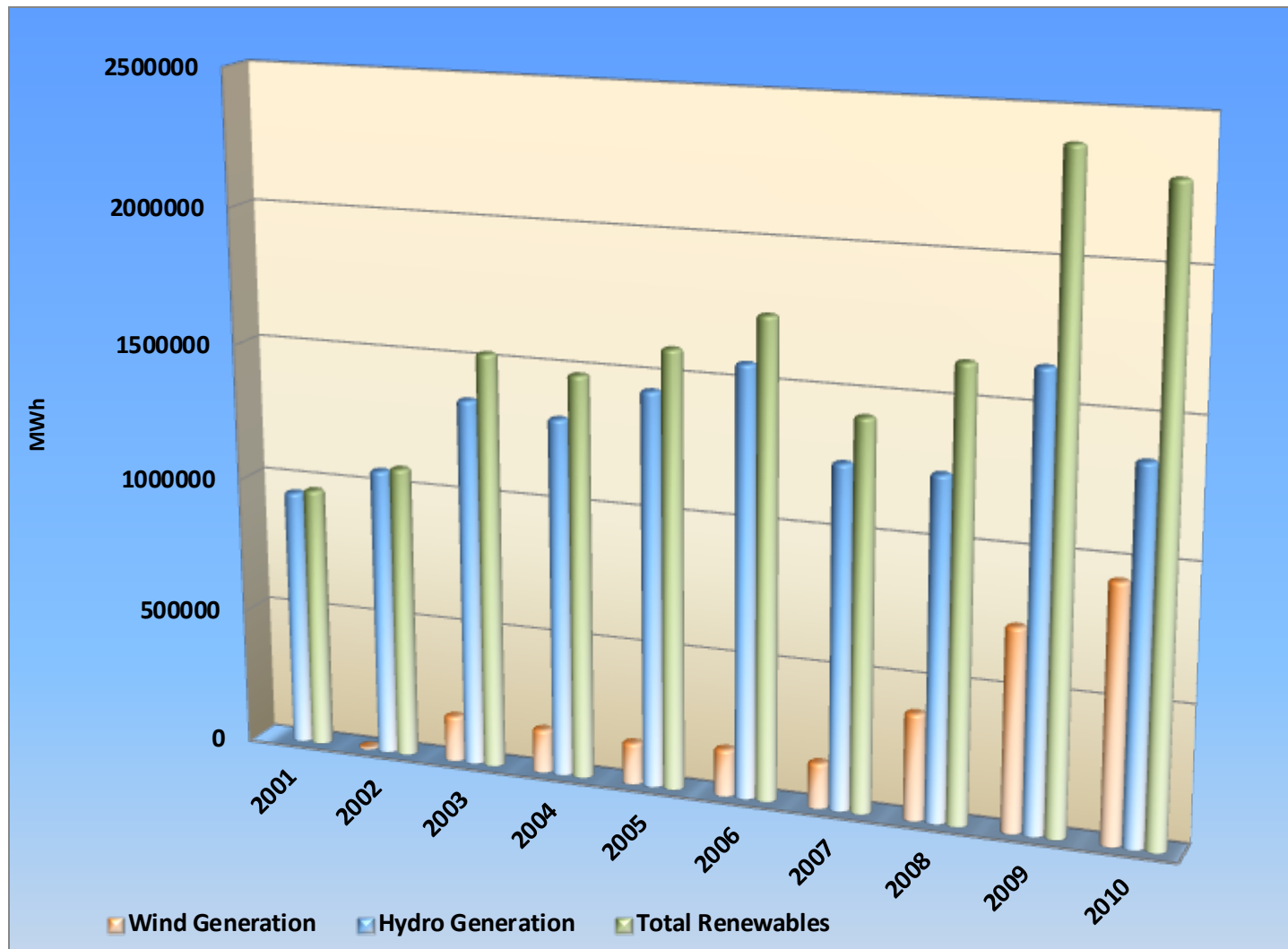
Production of crude oil in West Virginia has increased by 40 percent since 2001 to nearly 2 million barrels per year, a level not seen since the early 1990s. Overall, the state is a small producer and production declined throughout the 1990s.

Employment of secondary recovery via water flooding has allowed production to expand during the last decade. Over the past decade, as much as 40 percent of oil produced in the state has been from via water flooding, although that level has fallen in recent years.

Oil production is concentrated in the northwestern part of the state. Many wells co-produce both oil and natural gas.

Production

Renewable Electricity Generation (MWh) 2001 - 2010



	Wind Generation	Hydro Generation (MWh)	Total Renewables
2001		951,943	967,470
2002	9,023	1,065,736	1,080,341
2003	169,762	1,356,031	1,530,001
2004	161,191	1,318,279	1,481,541
2005	153,892	1,447,566	1,602,171
2006	173,757	1,572,433	1,746,190
2007	167,588	1,254,397	1,421,985
2008	391,910	1,248,037	1,639,947
2009	742,439	1,645,927	2,388,000
2010	939,172	1,355,420	2,294,000

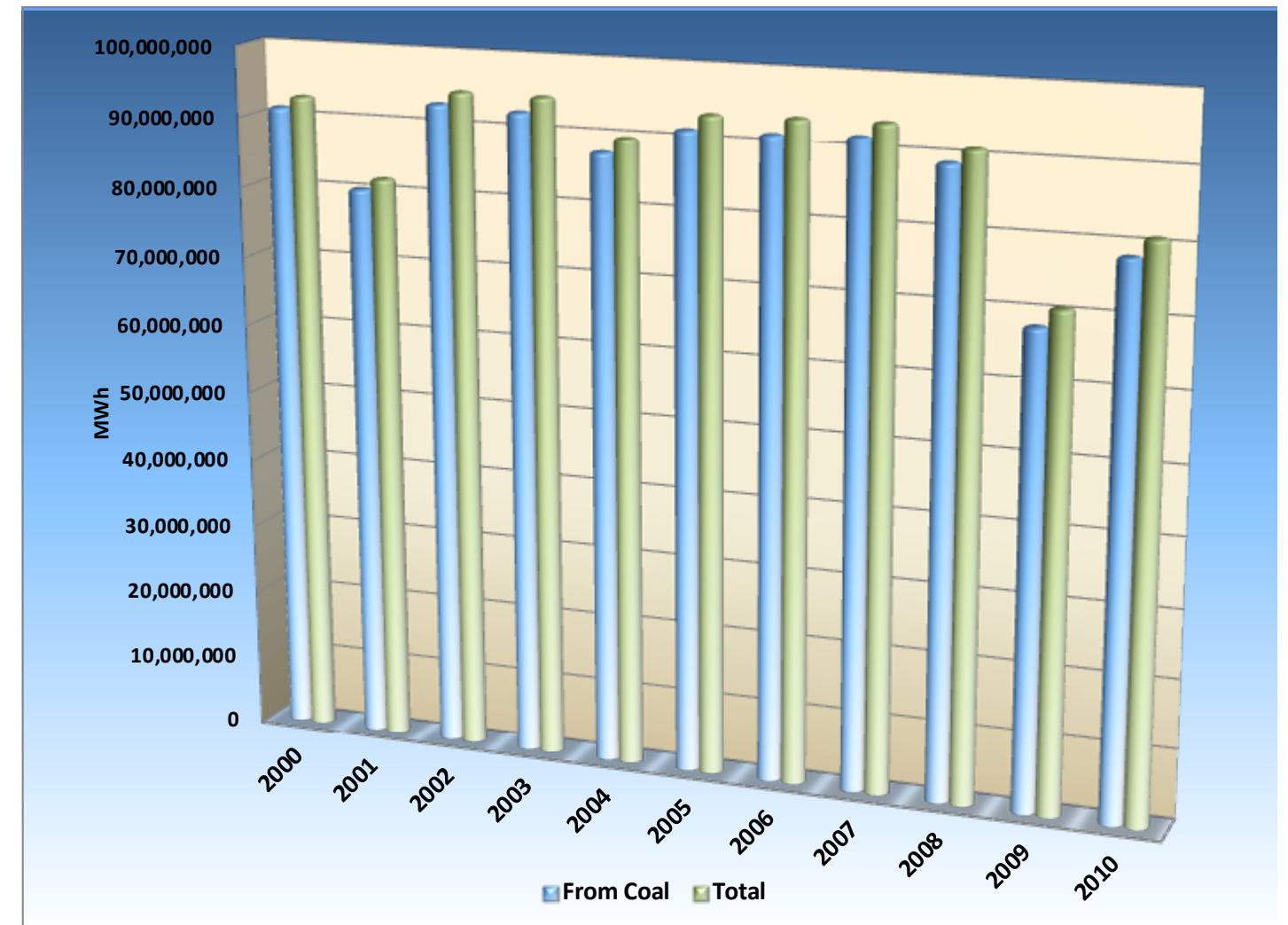
Over the last decade, West Virginia's production of electricity using renewable resources has ranged from 1.1 to 3.4 percent of total generation. The majority of that generation is hydro power with the remainder wind. The state's hydroelectric generating facilities are among the oldest in the nation, with two units over 100 years old. The youngest of the hydroelectric facilities came online in 2001 and additional facilities are under development.

The first wind power facility in the state came online in 2002, the second in 2008 and the third in 2010. This class of generation will expand in the near-term as additional facilities permitted and under construction are completed.

In 2011, West Virginia's first landfill gas-to-energy project began generating power. This project adds a third category of commercial renewable-based electricity produced in the state.

Production

Electricity (MWh) 2000 - 2010



Electricity production in West Virginia is closely tied to both state and national demand trends. Due to a portfolio of power plants with generation capability in excess of in-state demand, West Virginia's utilities have historically supplied 60 to 70 percent of their generation as wholesale power to several neighboring utilities whose customers demand more than their capability. Geographically, West Virginia is in a unique position to provide power to large metropolitan areas in the eastern U.S. that must import electricity.

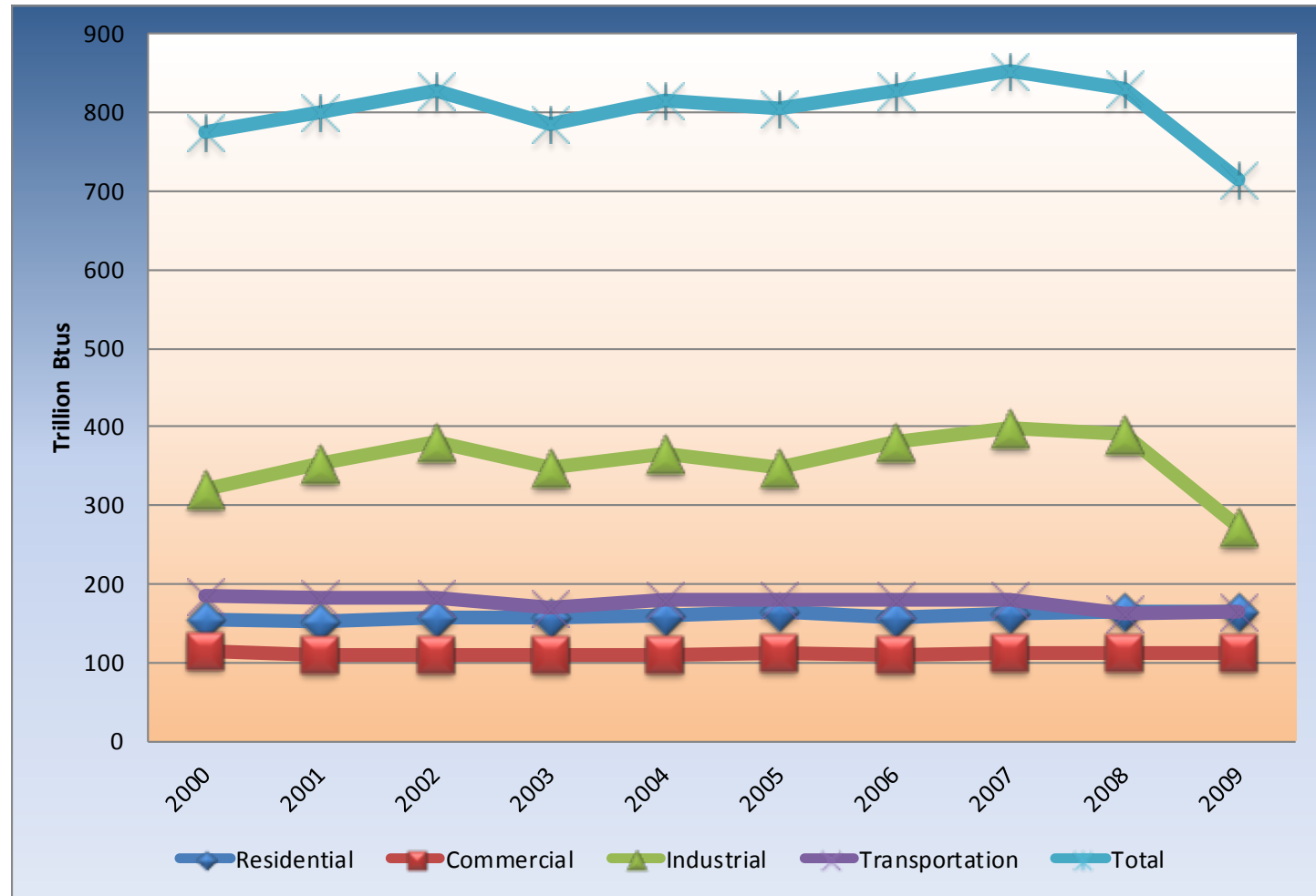
Until 2009, both state and national consumption of electricity had increased steadily for several decades. The recession-induced decline in demand for electricity affected West Virginia somewhat disproportionately, as power generation fell by about 22 percent compared to a decline in national demand of just under five percent. This difference is partly explained by the fact that West Virginia's demand fell by nearly 12 percent, led by industrial decline. The difference is also due to by coinciding large unit outages at some of the state's larger plants due to ongoing installments of major emissions control equipment required to be in place by the end of 2009.

Electricity Generation (MWh)

	From Coal	Total
2000	91,202,309	92,865,176
2001	80,214,404	81,836,725
2002	92,951,316	94,761,751
2003	92,468,983	94,711,554
2004	87,584,598	89,749,562
2005	91,417,003	93,626,285
2006	91,473,321	93,815,804
2007	91,866,265	93,933,109
2008	89,113,480	91,123,097
2009	68,079,900	70,782,514
2010	78,394,000	81,024,000

Chapter 2: Energy Consumption

Total Energy Consumption (Trillion BTUs) 2000 - 2009

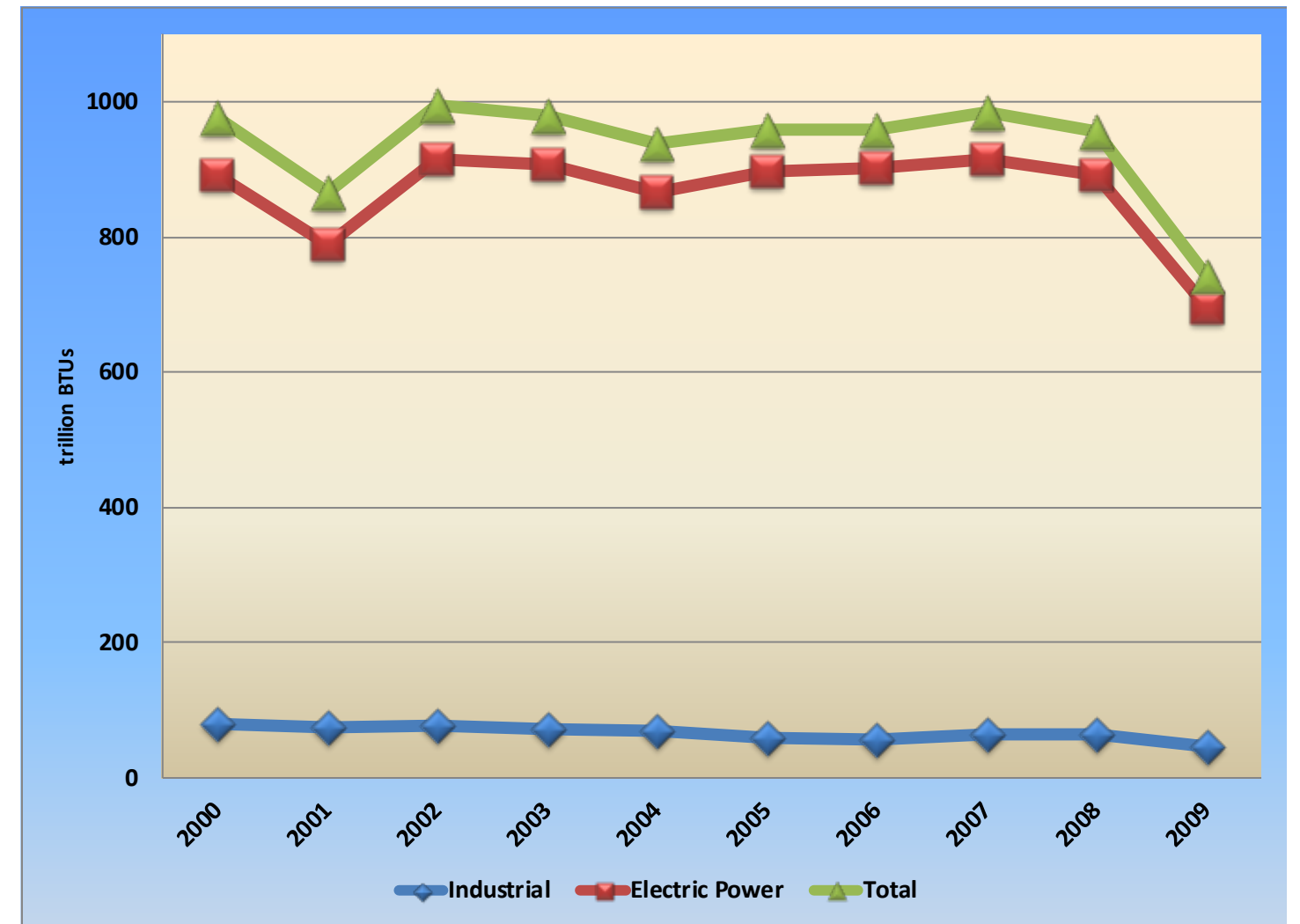


	Total	Res.	Comm.	Ind.	Trans.
2000	775.5	154.3	113.5	321.7	186.0
2001	800.8	153.3	110.3	354.3	183.0
2002	827.8	156.8	108.7	380.0	182.2
2003	784.8	158.0	110.7	347.0	169.1
2004	815.3	160.7	110.2	364.9	179.5
2005	805.4	164.8	112.4	347.2	180.9
2006	827.7	157.2	108.9	381.5	180.0
2007	853.2	163.5	111.7	398.8	179.2
2008	830.8	164.6	112.5	391.2	162.6
2009	715.6	165.2	111.3	274.0	165.1

Total end-use energy consumption figures for West Virginia are U.S. Department of Energy estimates. End use energy consumption is used to distinguish between energy used to conduct business and maintain households within the State versus larger figures that also include energy used to produce exported electricity. End-use energy consumption includes direct consumption of coal, natural gas, petroleum products, renewable sources and electricity, including losses associated with generation and transmission of electricity to in-state customers. Consumption of these resources is disaggregated for each major end-use sector of the economy: residential, commercial, industrial and transportation. For some sectors and commodities, consumption figures are estimated because actual consumption data is not available. This applies largely to consumption of petroleum products in the residential, commercial and industrial sectors and to consumption of natural gas by the industrial sector. Petroleum consumption for these sectors is based on sales data for the state, which is closely tied to actual use of the commodity. Industrial natural gas consumption is based on both deliveries and actual consumption data.

Consumption

Coal (Trillion BTUs) 2000 - 2009



Like most of the country, demand for coal in West Virginia is comprised primarily of coal used for power generation. Direct consumption of coal by the industrial sector has declined steadily for decades. Industrial consumption includes coal used for coke production and coal used to produce electricity for manufacturing processes, and is estimated based on deliveries. Direct consumption of coal by the residential and commercial sectors is estimated based on the amount of coal distributed to those combined sectors. Residential coal consumption is assumed to be 10 percent of commercial and institutional coal consumption, which was published by EIA as zero for 2008 and 2009. Thus, residential coal consumption is published as zero when it is likely to be non-zero but very small.

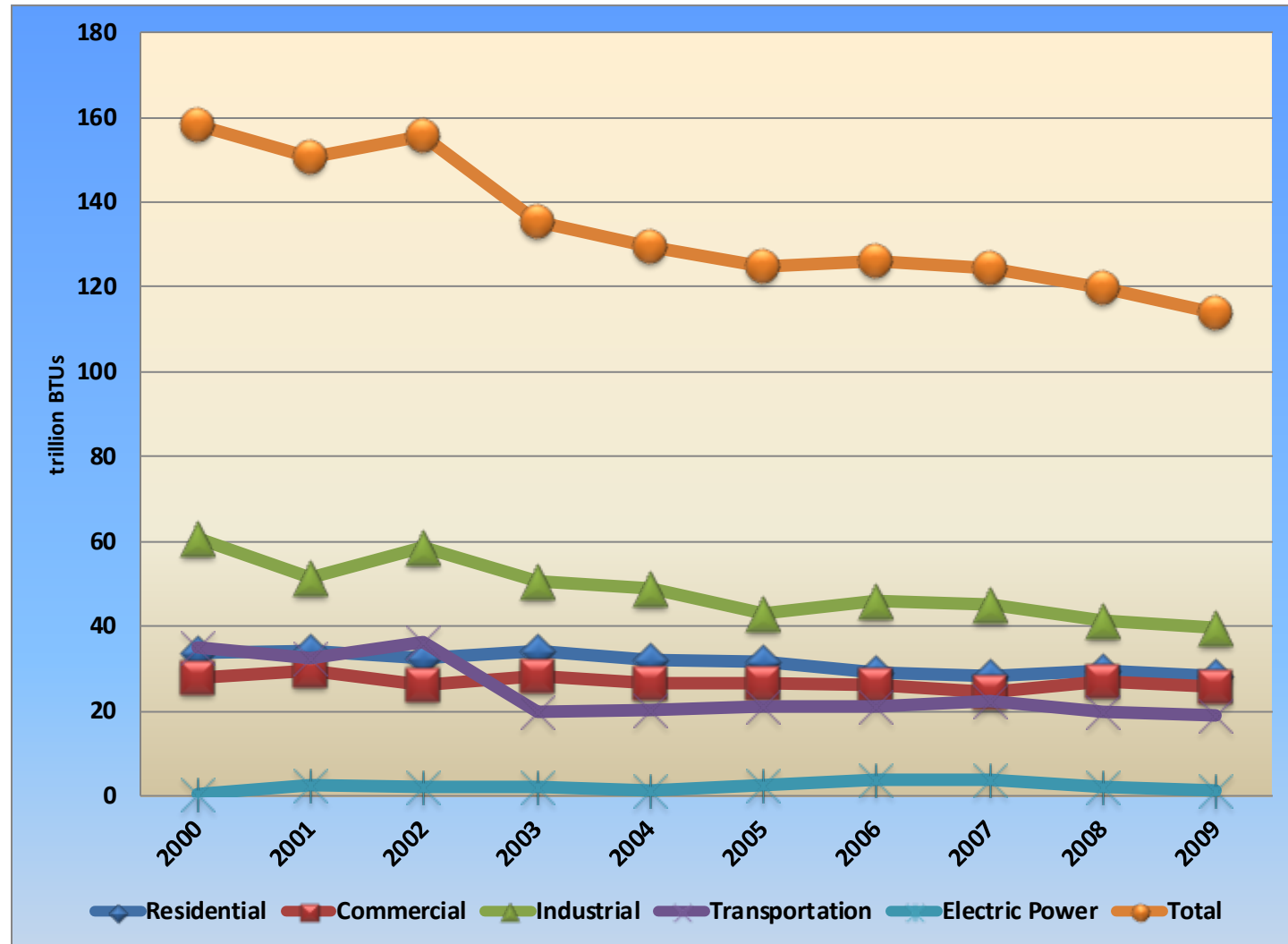
Coal Consumption in trillion BTUs

	Industrial	Electric Power	Total
2000	81.1	891.2	977.9
2001	75.9	789.5	866.6
2002	77.0	915.7	993.5
2003	71.2	906.1	978.3
2004	70.7	865.0	937.0
2005	59.6	898.0	959.6
2006	55.9	902.3	958.9
2007	65.8	915.8	983.3
2008	63.8	891.9	955.7
2009	47.4	695.5	742.9

Consumption

Natural Gas (Trillion BTUs)

2000 - 2009



Natural Gas Consumption in trillion BTUs

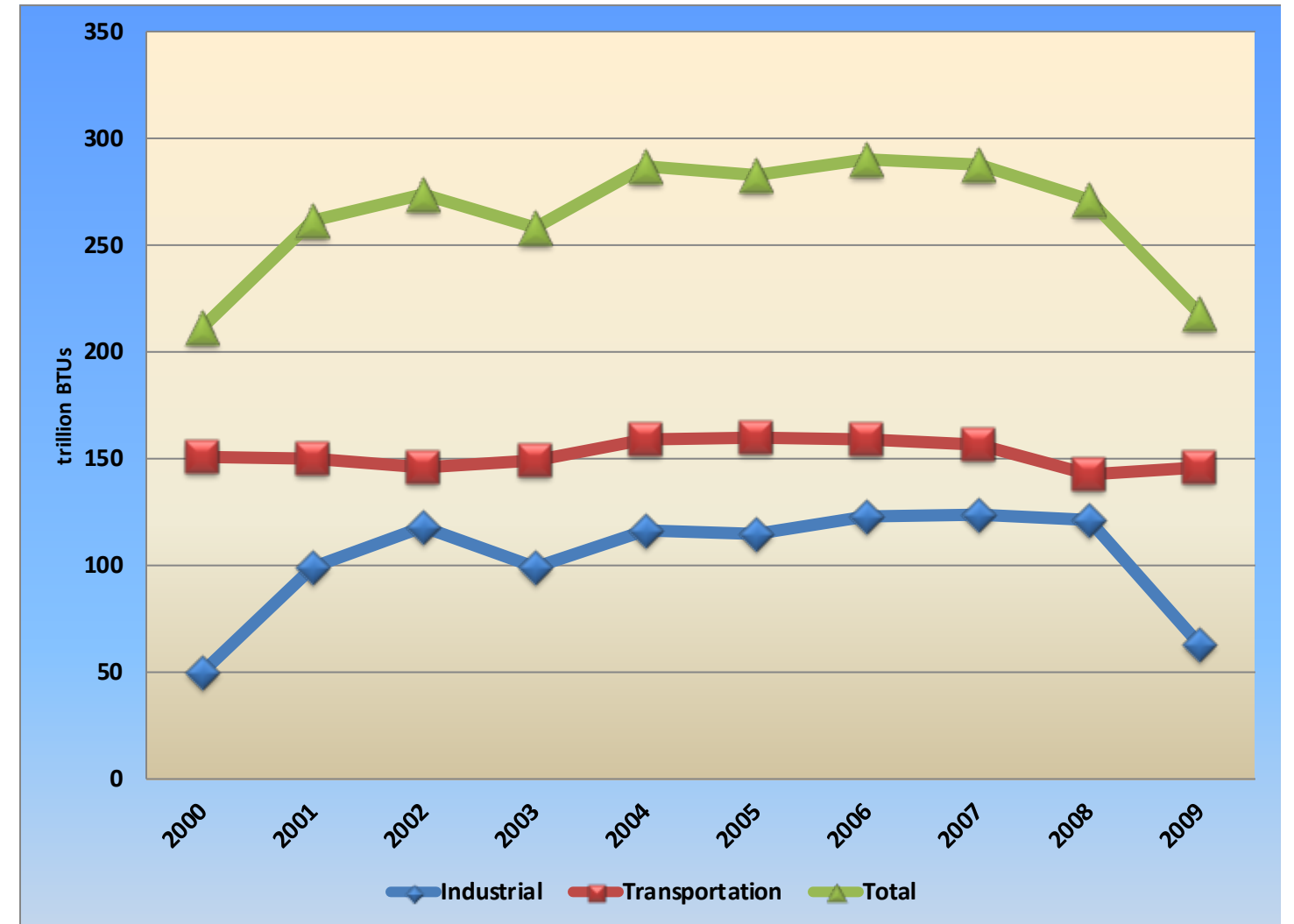
	Residential	Commercial	Industrial	Transportation	Electric Power	Total
2000	33.8	28.0	60.7	35.0	0.5	158.0
2001	34.1	29.6	51.6	32.5	2.7	150.5
2002	32.7	26.3	58.5	36.1	2.0	155.6
2003	34.3	28.4	50.7	19.7	2.2	135.3
2004	32.1	26.6	49.0	20.1	1.5	129.3
2005	31.8	26.8	43.0	21.0	2.4	125.0
2006	29.2	26.3	45.8	21.2	3.8	126.3
2007	28.5	24.3	45.2	22.4	4.0	124.4
2008	29.6	27.2	41.4	19.7	2.0	119.9
2009	28.3	25.7	39.5	19.2	1.2	113.9

Natural gas consumption in West Virginia has trended downward for more than a decade, led by decreasing industrial and transportation use. Residential and commercial use has also declined, but less dramatically. Gas consumed by the industrial sector is estimated from the sum of gas delivered to the sector plus gas consumed as lease fuel and plant fuel. The transportation sector's use of gas is almost entirely for operation of natural gas pipelines. Gas used for power generation peaked in 2007, at three percent of total demand, but remains a small portion of overall use for the State.

Consumption

Petroleum (Trillion BTUs)

2000 - 2009



Petroleum Consumption in trillion BTUs

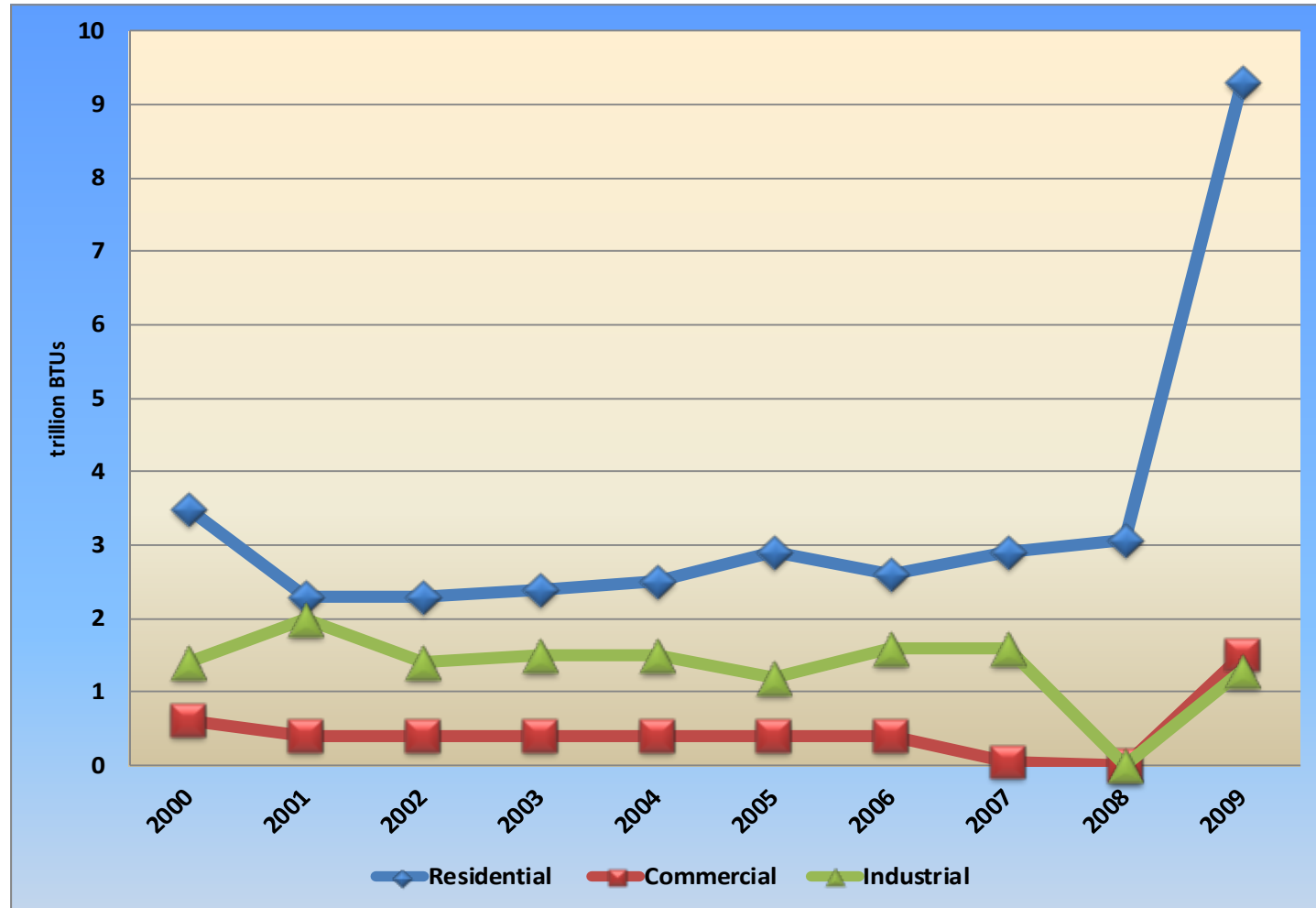
	Industrial	Transportation	Total
2000	50.1	151.0	211.9
2001	99.3	150.5	261.9
2002	118.2	146.1	273.8
2003	99.3	149.4	258.0
2004	116.7	159.3	286.8
2005	114.6	159.9	282.9
2006	122.8	158.8	290.0
2007	123.7	156.7	287.5
2008	121.6	142.9	271.6
2009	63.5	140.1	210.9

Consumption of petroleum in West Virginia is dominated by the transportation sector, at a fairly predictable level. But the ups and downs of consumption is shaped by the industrial sector. With the exception of the electric power sector, consumption of petroleum products is based on sales data for the State. Nearly half of State consumption is motor gasoline, with distillate consumed in both industrial and transportation sectors the second largest category.

Consumption

Wood (Trillion BTUs)

2000 - 2009



Wood Consumption in trillion BTUs

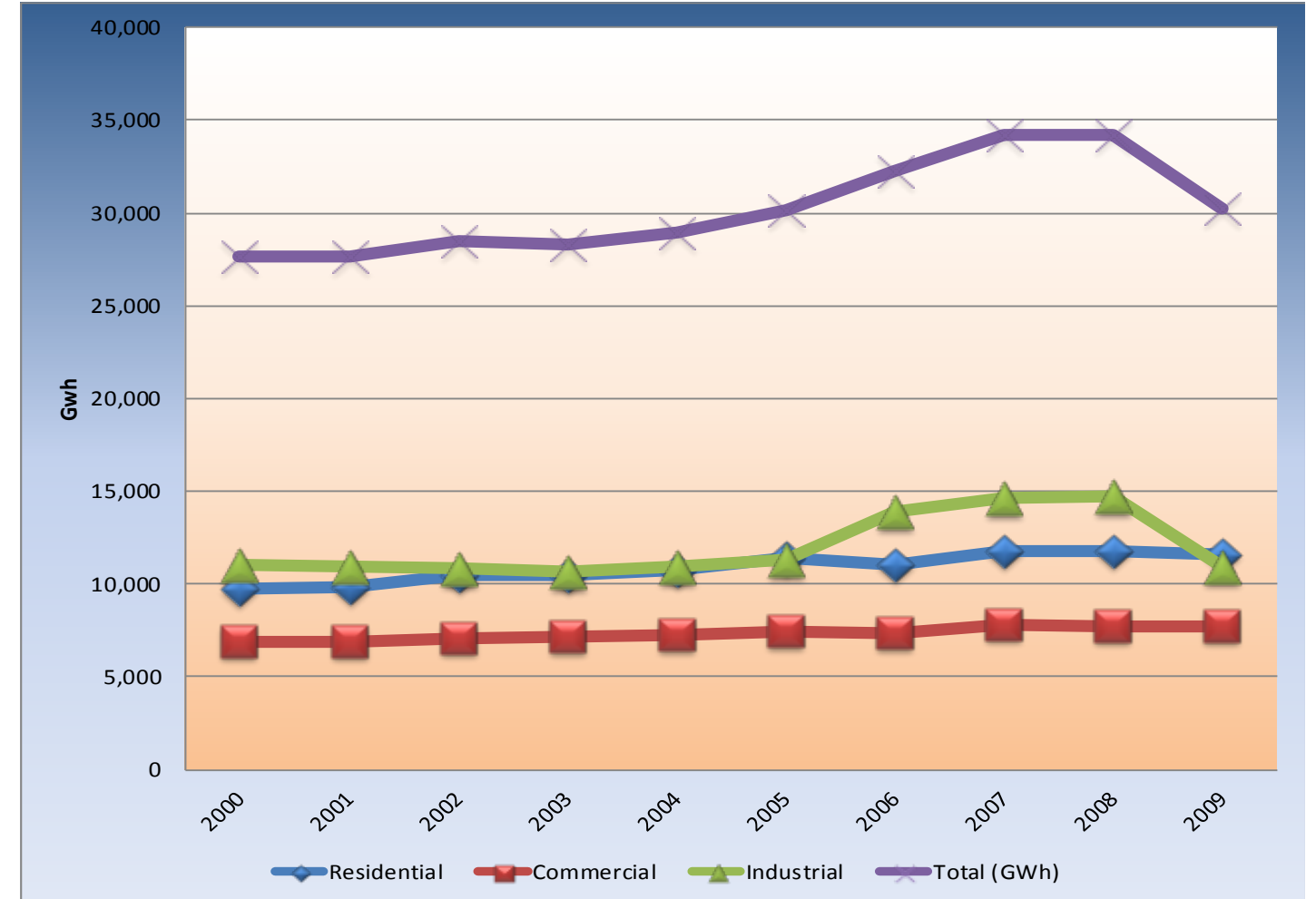
	Residential	Commercial	Industrial
2000	3.5	0.6	1.4
2001	2.3	0.4	2.0
2002	2.3	0.4	1.4
2003	2.4	0.4	1.5
2004	2.5	0.4	1.5
2005	2.9	0.4	1.2
2006	2.6	0.4	1.6
2007	2.9	0.05	1.6
2008	3.1	0	0
2009	9.3	1.5	1.3

Like other state-level consumption estimates, these figures are estimates of wood and wood waste consumption based on national and select state-level Residential Energy Consumption Survey (RECS) data. After a slow increase in residential wood use beginning in 2001, use shot up in 2009 likely due to higher energy prices and to tax credits available for purchase of wood-pellet stoves, which corresponded with a jump in purchases of pellet stoves in 2008. Wood and wood waste consumption estimates are based on the number of occupied housing units that use wood as primary heating fuel from the American Community Survey. The figures for West Virginia are allocated in proportion to Census Bureau data on housing units. Commercial wood consumption, outside of combined heat and power and electricity generating facilities, is allocated in proportion to residential consumption. Industrial use is allocated using State and industry-level data series for fuel consumption in wood and wood-related products sub-industries from the U.S. Department of Commerce's Economic Census of Manufacturing.

Consumption

Electricity (GWh)

2000 - 2009



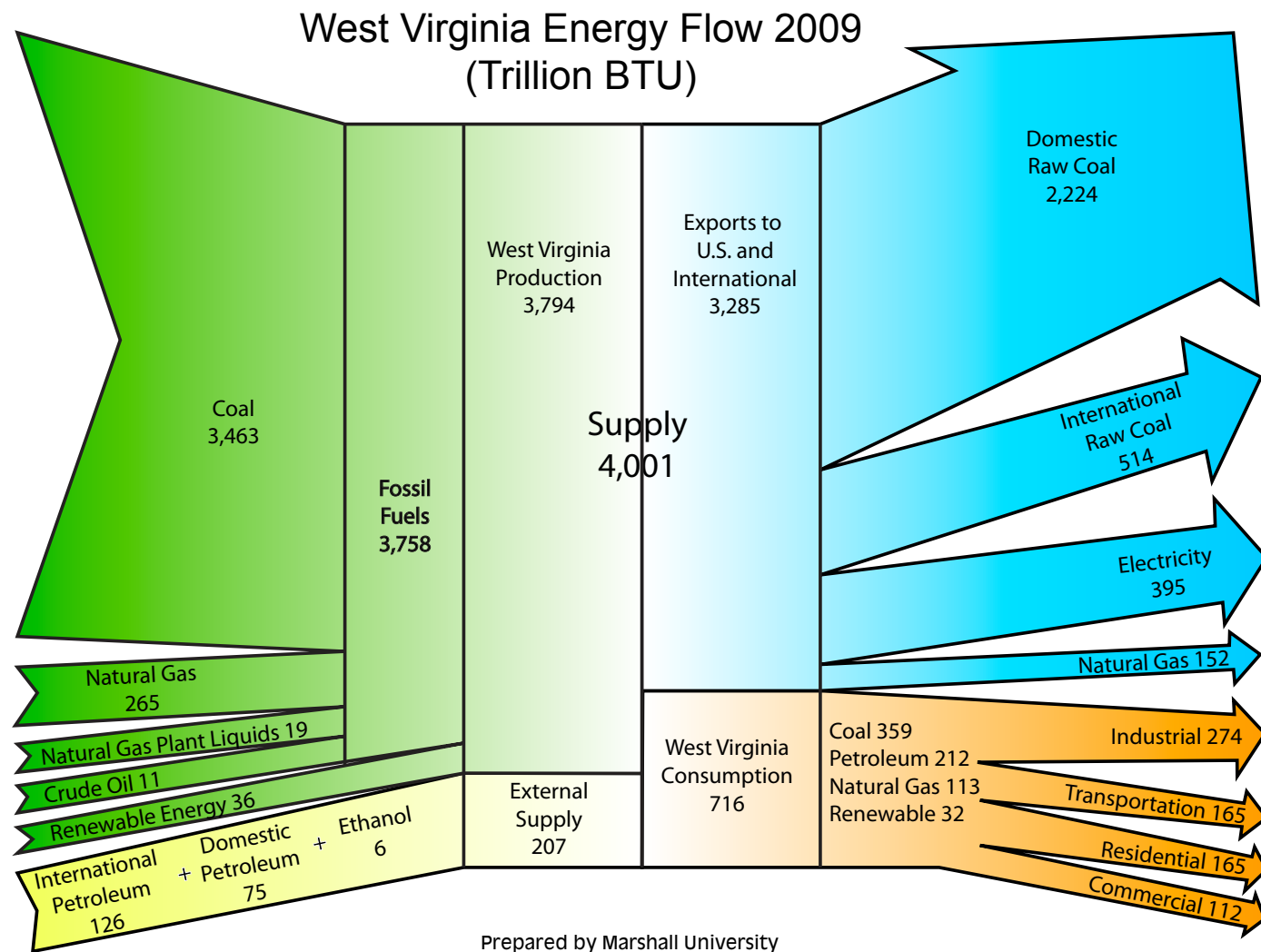
Electricity consumption in West Virginia rose steadily from 2000 through 2008, but fell by nearly 12 percent in 2009. The decrease was led by industrial demand, which fell by nearly 26 percent following the closure of a primary aluminum manufacturing facility.

Electricity Consumption in GWh

	Residential	Commercial	Industrial	Total(GWh)
2000	9,738	6,872	11,083	27,693
2001	9,828	6,863	10,978	27,669
2002	10,444	7,117	10,902	28,463
2003	10,473	7,136	10,687	28,297
2004	10,756	7,217	10,942	28,919
2005	11,384	7,452	11,312	30,152
2006	11,014	7,377	13,916	32,312
2007	11,749	7,769	14,661	34,184
2008	11,763	7,716	14,738	34,221
2009	11,588	7,694	10,985	30,271

Chapter 3: West Virginia Energy Flow

2009



Prepared by Marshall University under contract to WV Division of Energy

West Virginia energy flow describes the production, delivery and consumption of energy resources in terms of energy value, expressed in trillion Btus (British Thermal Units), the common denominator for all types of energy resources. The energy content by category of fuel is shown on the left side of the graphic. The right side shows purchases of production, including electricity, gas and coal exports and in-state consumption by sector.

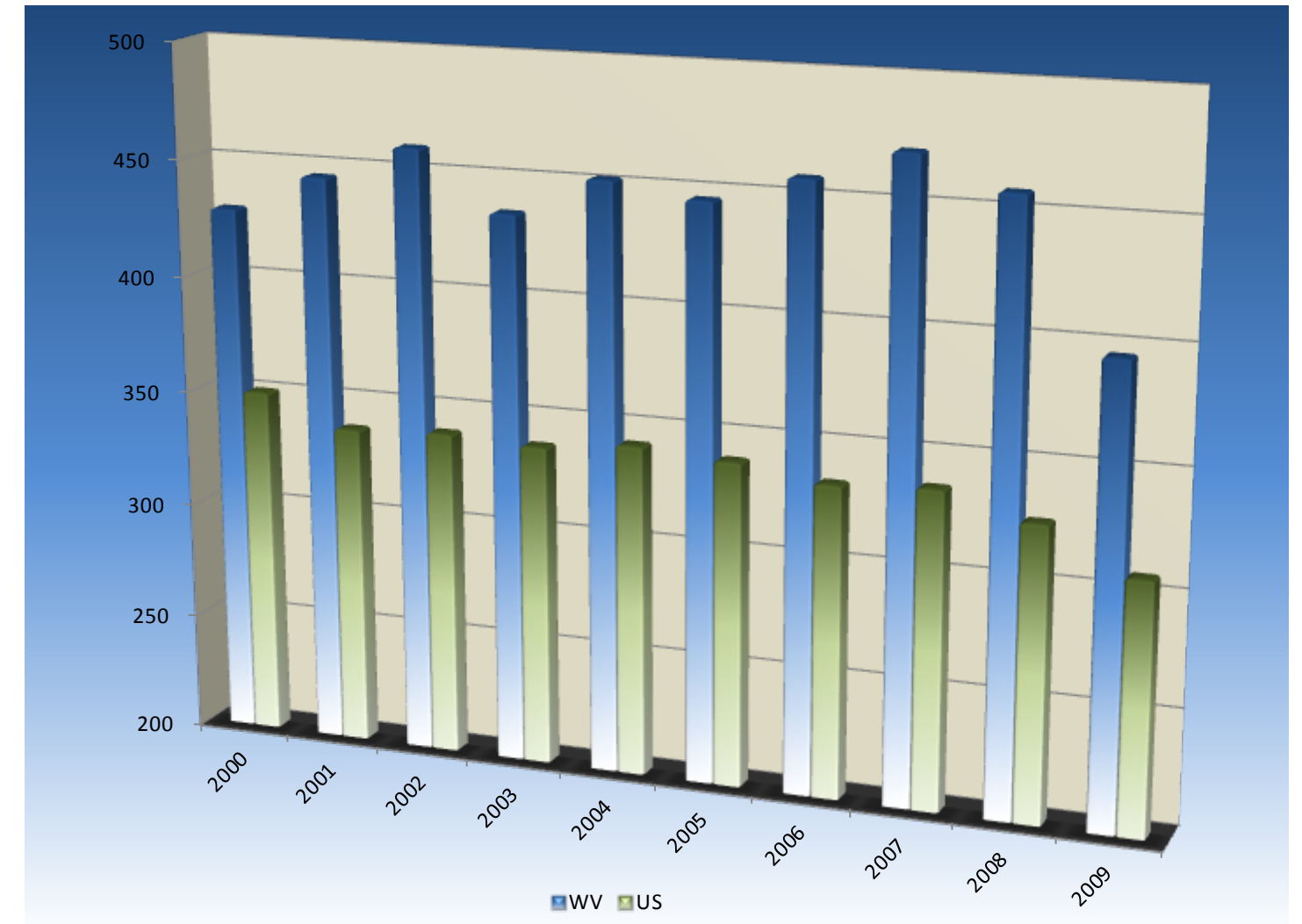
West Virginia produced 3,794 Tbtu of energy commodities in 2009, of which 91 percent was the energy value of coal. Natural gas comprised close to six percent of the total value, with the remaining three percent from petroleum, NGPL and renewable energy produced from wood, wind and water.

Like most states, West Virginia is a net consumer of petroleum products and had to import 95 percent of what it consumed in 2009. Of the imported petroleum, about 63 percent is from non-US sources based on the US ratio of gross imports to consumption. A small amount of ethanol is also consumed as a fuel additive and is included in consumption of renewables.

Of total supply including petroleum imports, West Virginia consumed about 18 percent in 2009. The rest was exported as raw coal to domestic and international markets. Additional exports were natural gas and electricity, generated largely from coal.

Chapter 4: Energy Intensity WV vs. the US

Per Capita Energy Consumption_(mmbtu) 2000 - 2009



In terms of physical energy consumption per capita, West Virginia used about 29 percent more energy per person in 2009 than the nation as a whole. West Virginia also saw an eight percent decrease in per capita energy consumption from 2000 to 2009 while the nation experienced a twelve percent decrease. Because the U.S. was in a recession during 2009 much of the decline in energy consumption can be attributed to decreased economic activity.

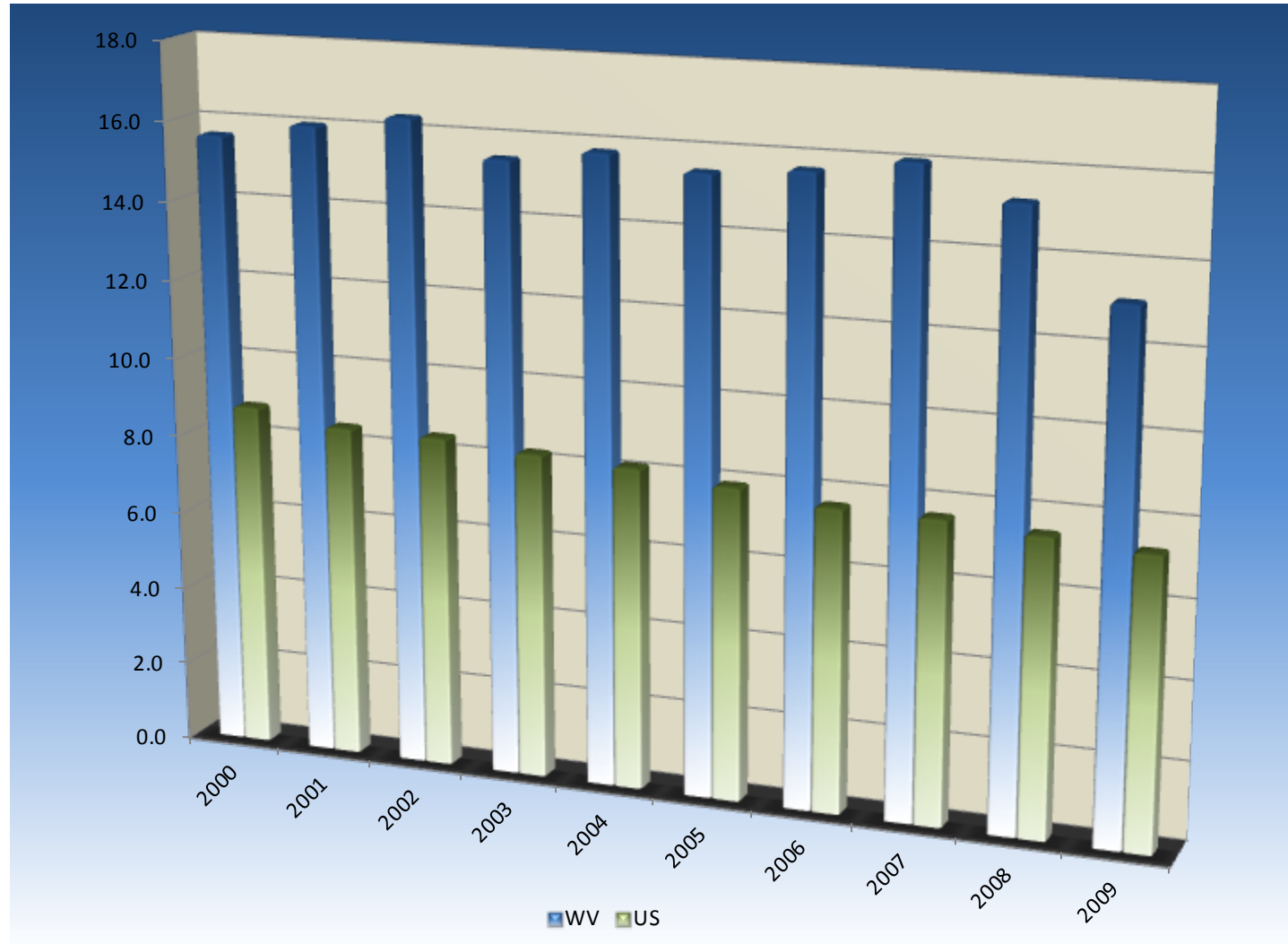
Per capita Energy Consumption (mmbtus)

	WV	US
2000	429	350
2001	445	338
2002	460	340
2003	435	338
2004	452	342
2005	446	340
2006	458	334
2007	471	336
2008	458	327
2009	396	308

Energy Intensity

per \$ of GSP/GDP (thousand btus)

2000 - 2009



Energy Consumption per Dollar of GSP/GDP, Chained \$2005 (thousand btus)

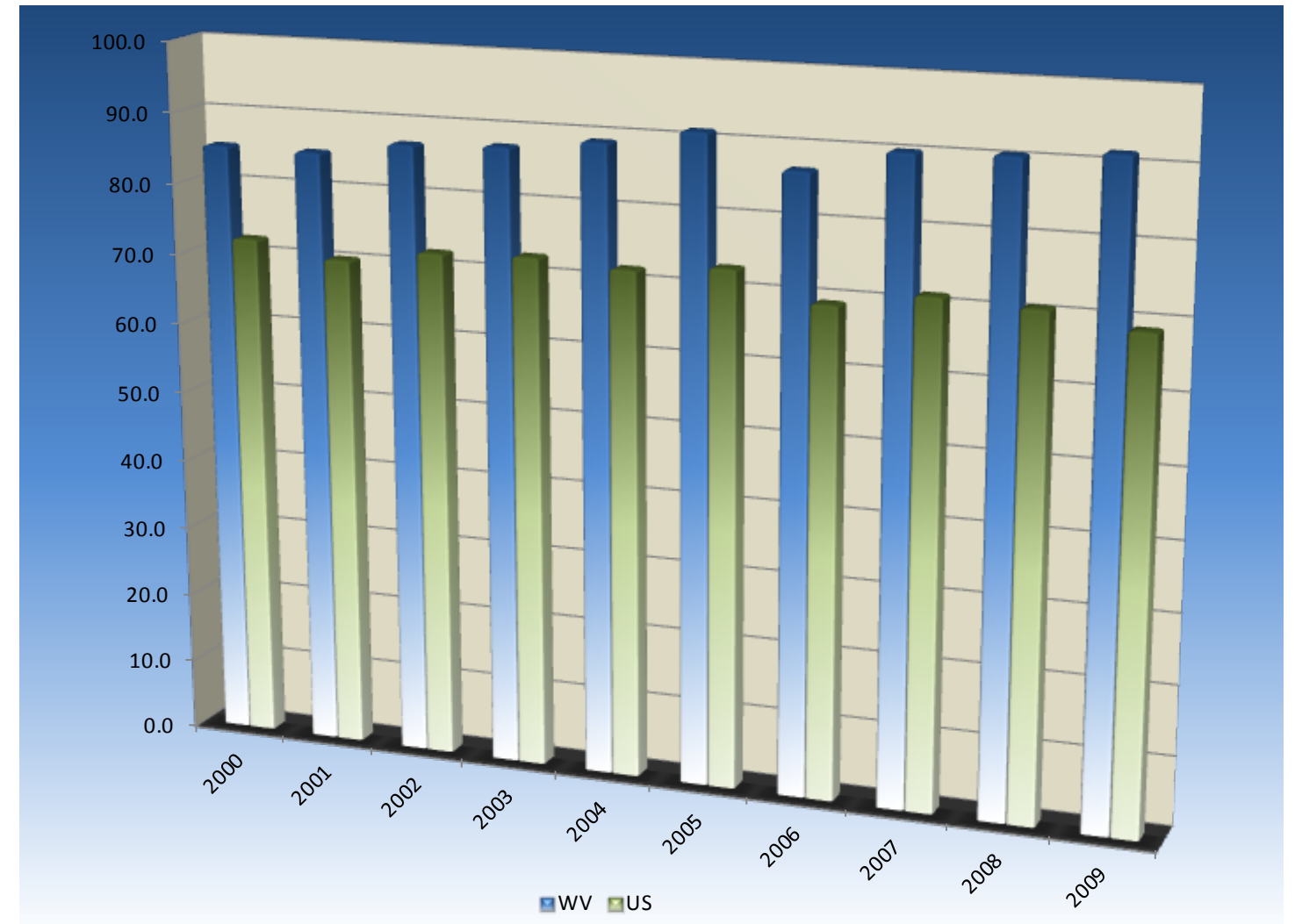
	WV	US
2000	15.65	8.81
2001	16.03	8.49
2002	16.37	8.46
2003	15.51	8.29
2004	15.83	8.18
2005	15.50	7.95
2006	15.70	7.69
2007	16.06	7.67
2008	15.29	7.51
2009	13.15	7.34

In terms of energy consumption per dollar of GDP, West Virginia's gross state product is 80 percent more energy intensive relative to the US. Including the recessionary year of 2009, intensity by this measure fell by 14 percent compared to a national decline of two percent.

Energy Intensity

Residential Energy Intensity per Capita (mmbtu)

2000 - 2009



Residential Energy Consumption per Capita (mmbtu)

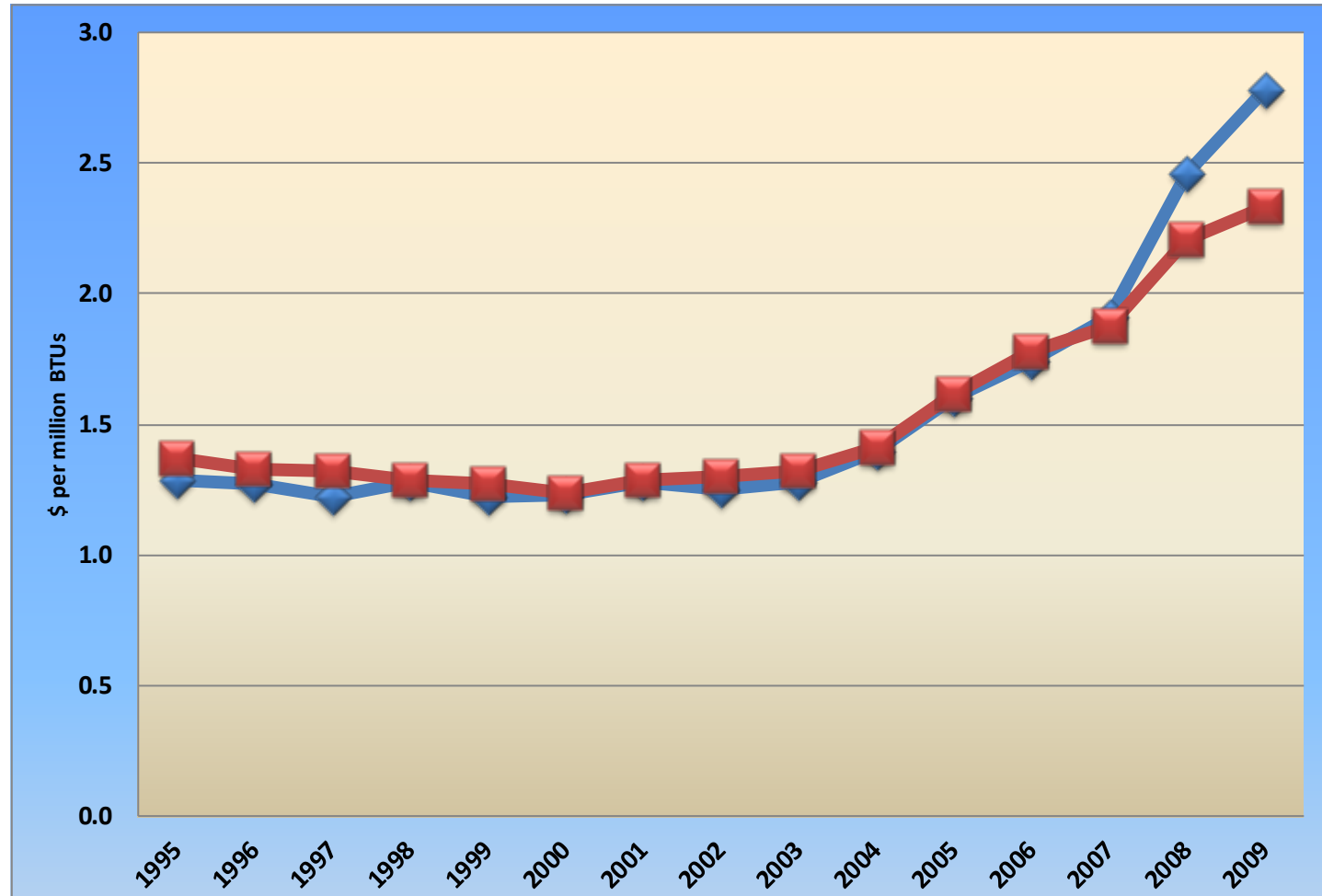
	WV	US
2000	85.4	72.4
2001	85.2	70.4
2002	87.1	72.3
2003	87.7	72.8
2004	89.1	72.1
2005	91.4	73.2
2006	87.0	69.4
2007	90.3	71.6
2008	90.7	71.0
2009	91.7	69.1

2009 household energy consumption per capita in West Virginia was 33 percent greater than for the nation as a whole, and rose by seven percent since 2000 when it was 18 percent greater than the nation.

Chapter 5: Energy Price Histories WV vs. the US

Coal - Total (Dollars per million BTU)

1995 - 2009

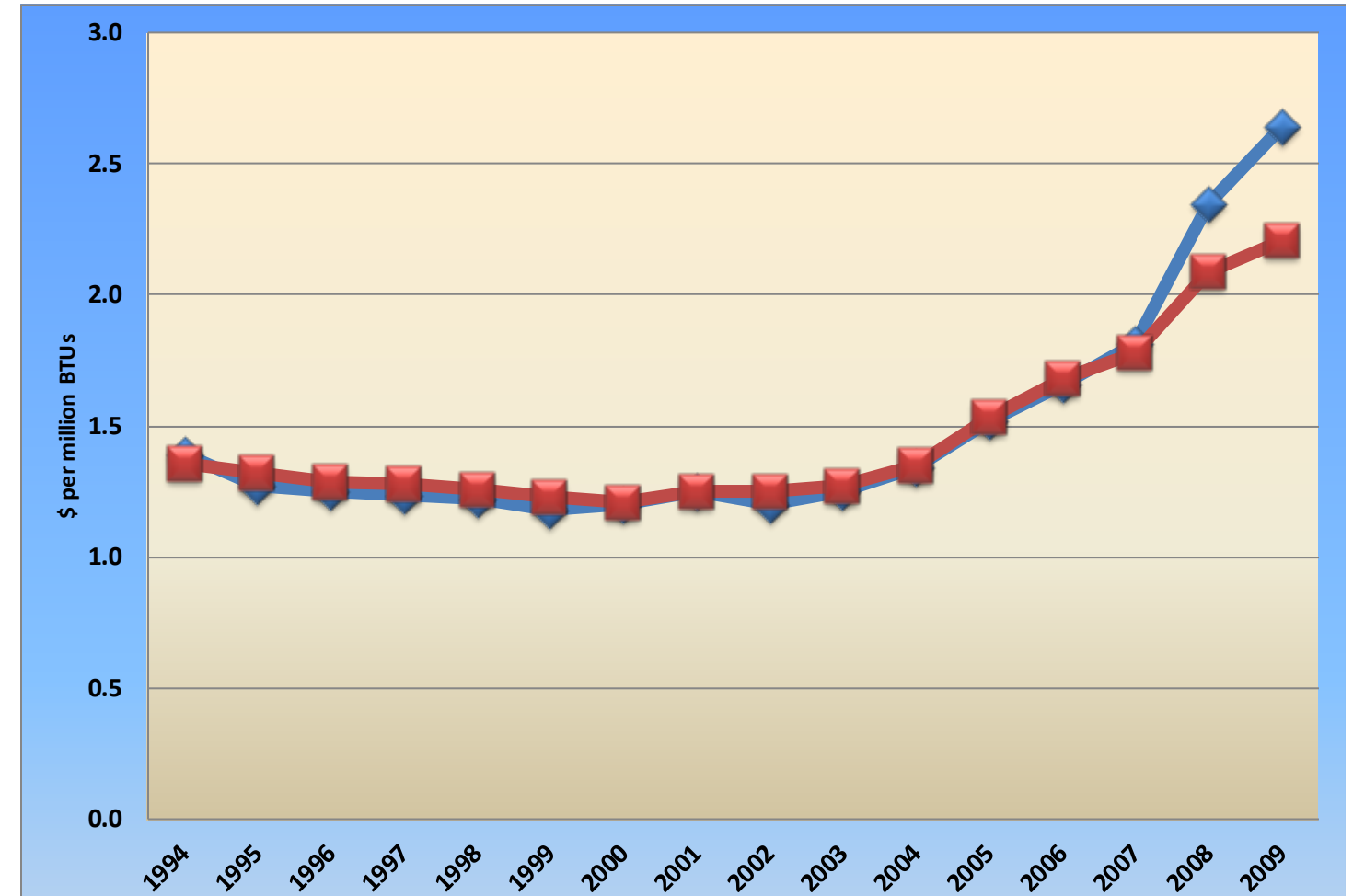


	WV	US
1995	1.29	1.37
1996	1.27	1.33
1997	1.22	1.32
1998	1.28	1.29
1999	1.22	1.27
2000	1.23	1.24
2001	1.28	1.29
2002	1.25	1.30
2003	1.28	1.32
2004	1.40	1.41
2005	1.60	1.62
2006	1.74	1.78
2007	1.91	1.88
2008	2.46	2.21
2009	2.78	2.33

WV Energy Price History

Coal - Electric Power (Dollars per million BTU)

1994 - 2009

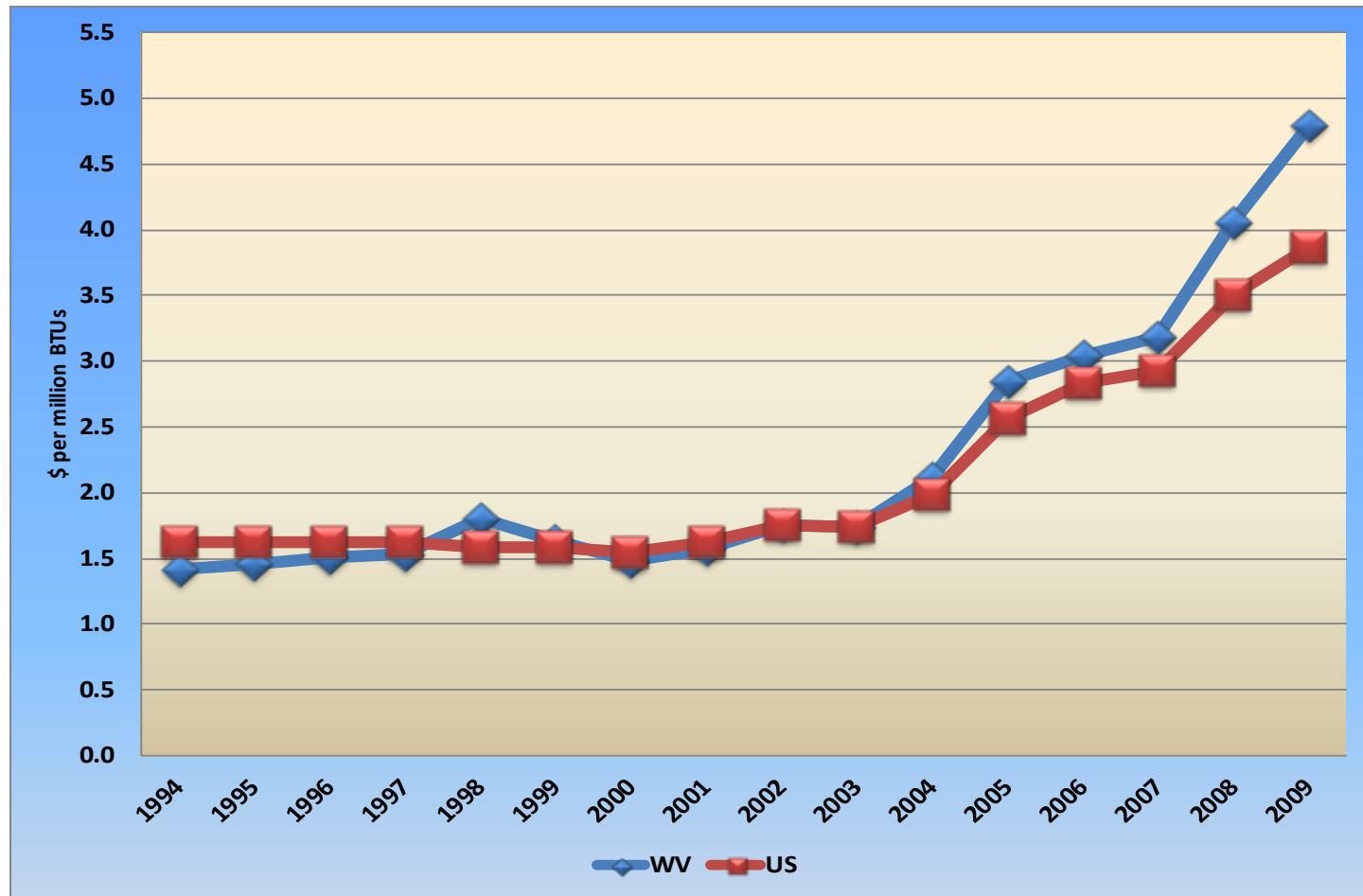


	WV	US
1994	1.39	1.36
1995	1.27	1.32
1996	1.25	1.29
1997	1.24	1.28
1998	1.22	1.26
1999	1.18	1.23
2000	1.20	1.21
2001	1.25	1.25
2002	1.2	1.25
2003	1.25	1.27
2004	1.34	1.35
2005	1.52	1.53
2006	1.66	1.68
2007	1.81	1.78
2008	2.35	2.09
2009	2.64	2.21

WV Energy Price History

Coal - Industrial (Dollars per million BTU)

1994 - 2009

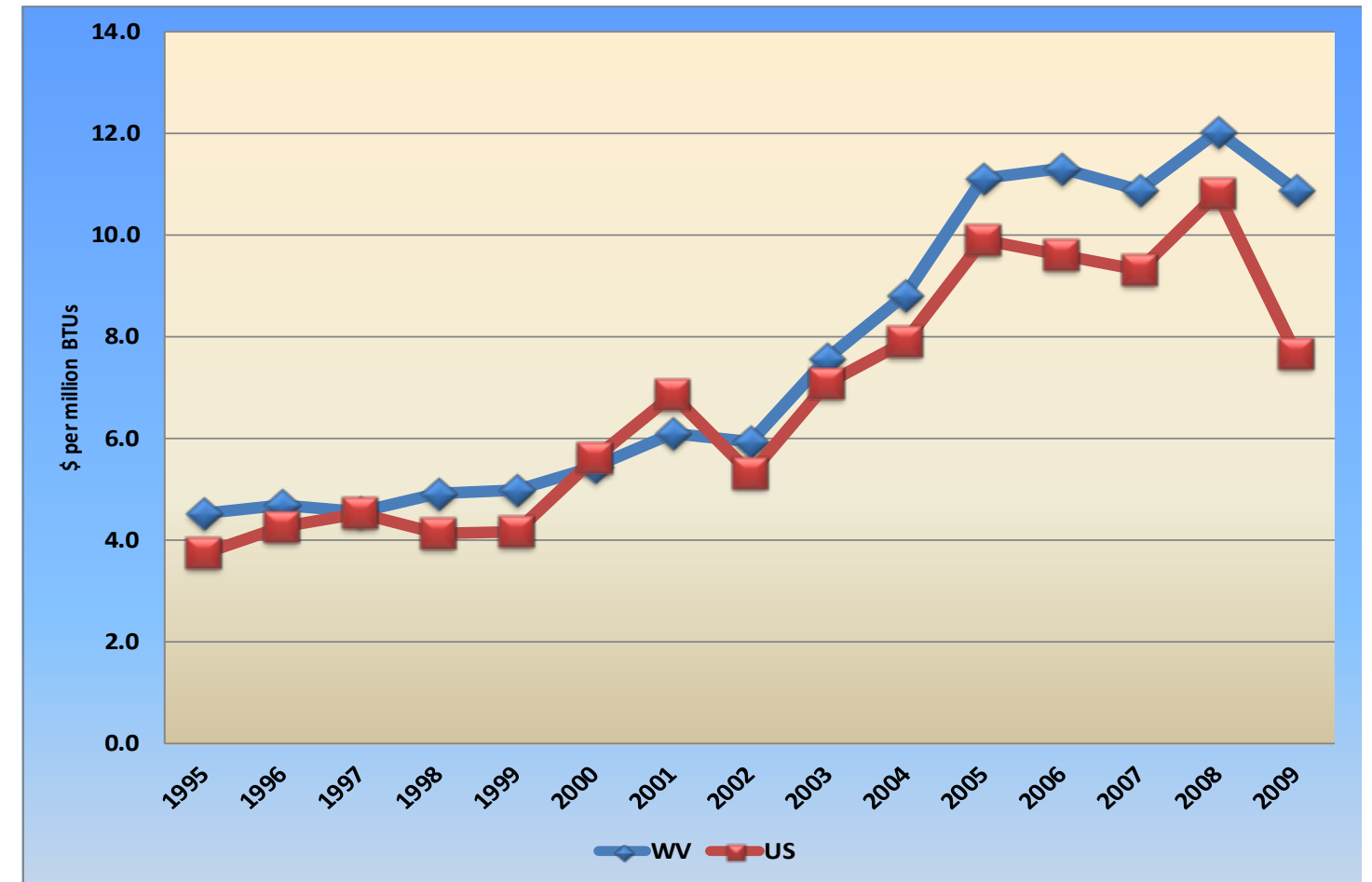


	WV	US
1994	1.42	1.62
1995	1.46	1.63
1996	1.51	1.62
1997	1.53	1.62
1998	1.81	1.58
1999	1.64	1.58
2000	1.48	1.55
2001	1.57	1.63
2002	1.75	1.75
2003	1.74	1.74
2004	2.11	1.99
2005	2.85	2.56
2006	3.04	2.83
2007	3.18	2.92
2008	4.06	3.51
2009	4.79	3.87

WV Energy Price History

Natural Gas - Total (Dollars per million BTU)

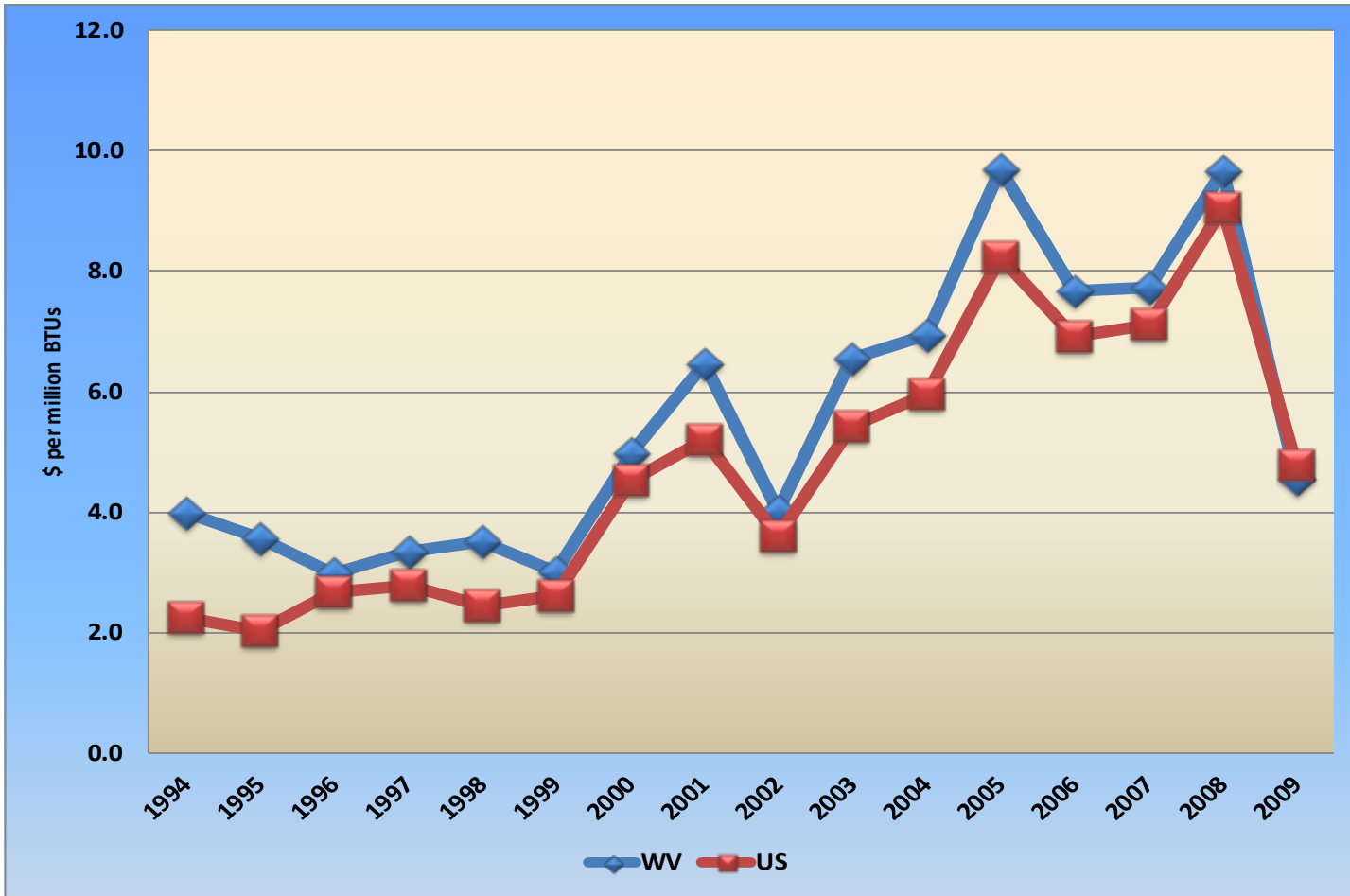
1995 - 2009



	WV	US
1995	4.54	3.73
1996	4.69	4.25
1997	4.56	4.53
1998	4.91	4.13
1999	4.98	4.16
2000	5.46	5.62
2001	6.09	6.87
2002	5.94	5.31
2003	7.58	7.08
2004	8.81	7.91
2005	11.11	9.92
2006	11.33	9.62
2007	10.88	9.31
2008	12.04	10.82
2009	10.89	7.66

WV Energy Price History

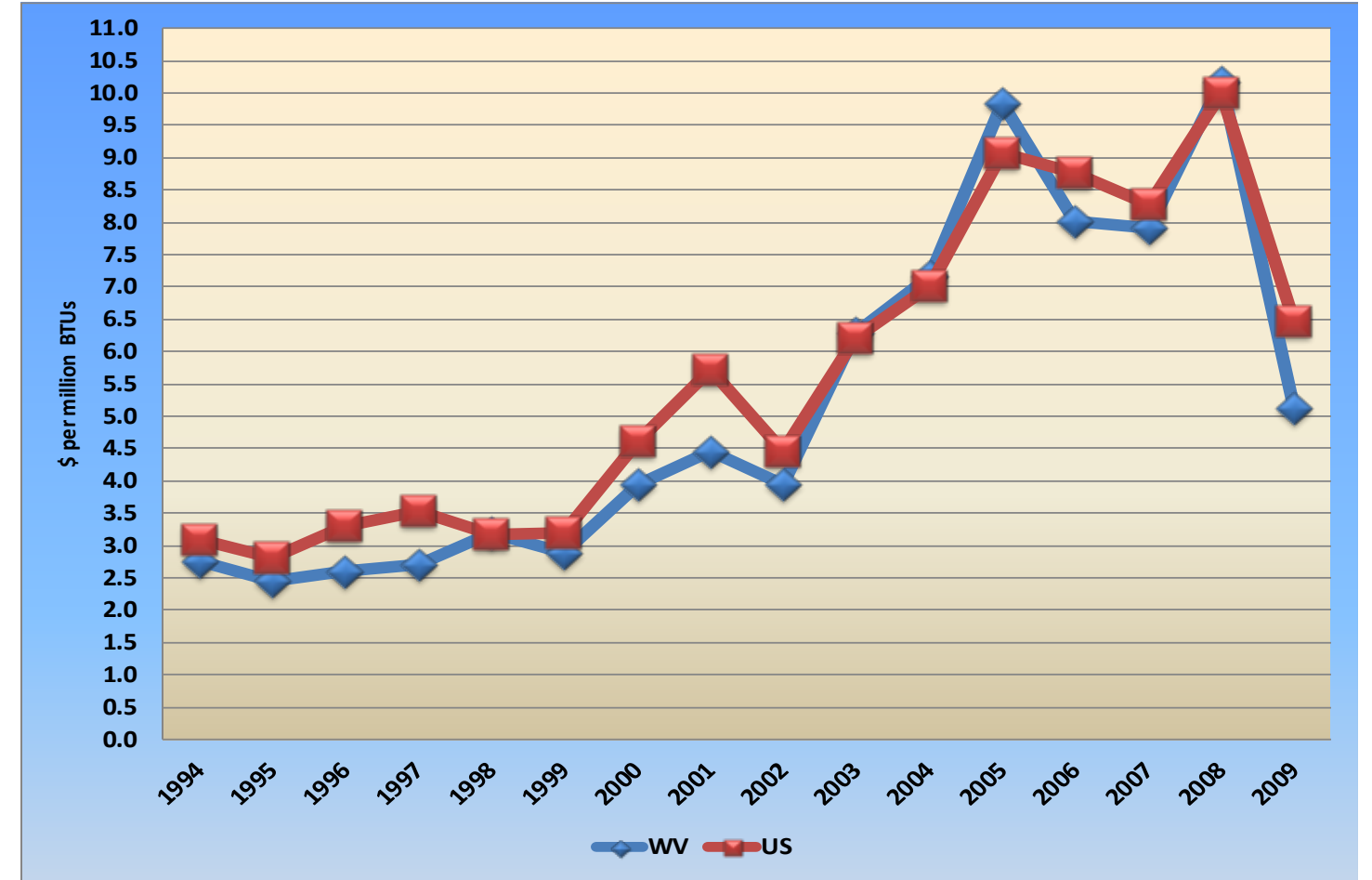
Natural Gas- Electric Power (\$ per million BTU) 1994 - 2009



	WV	US
1994	4.00	2.26
1995	3.58	2.03
1996	2.99	2.68
1997	3.35	2.79
1998	3.51	2.45
1999	3.00	2.62
2000	4.98	4.53
2001	6.46	5.21
2002	4.02	3.60
2003	6.55	5.42
2004	6.94	5.96
2005	9.70	8.25
2006	7.67	6.92
2007	7.74	7.11
2008	9.66	9.04
2009	4.55	4.79

WV Energy Price History

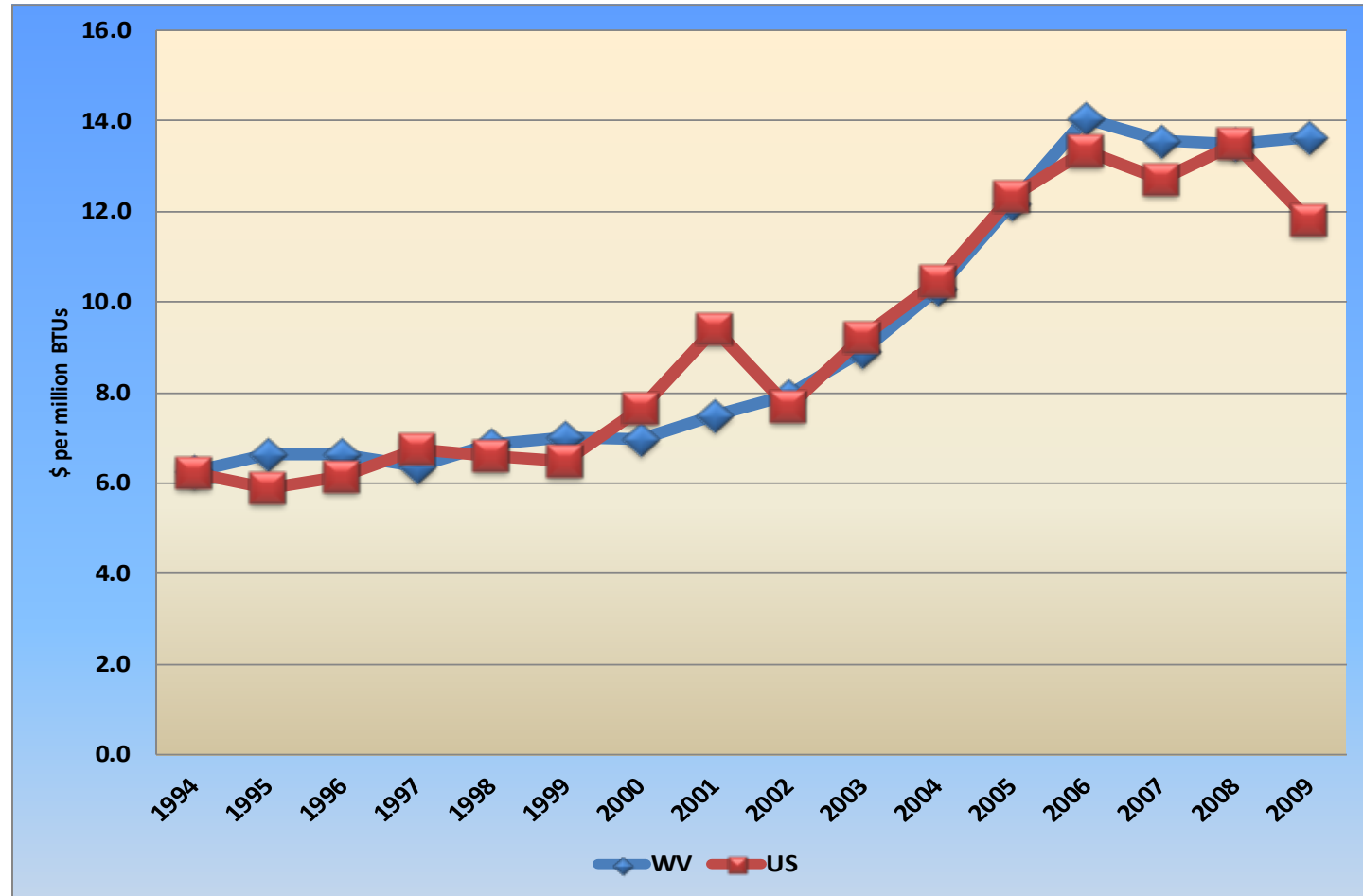
Natural Gas- Industrial (Dollars per million BTU) 1994 - 2009



	WV	US
1994	2.75	3.09
1995	2.45	2.80
1996	2.60	3.30
1997	2.72	3.53
1998	3.19	3.16
1999	2.88	3.21
2000	3.94	4.61
2001	4.46	5.71
2002	3.95	4.47
2003	6.29	6.20
2004	7.17	7.02
2005	9.84	9.08
2006	8.02	8.76
2007	7.92	8.28
2008	10.18	10.00
2009	5.13	6.48

WV Energy Price History

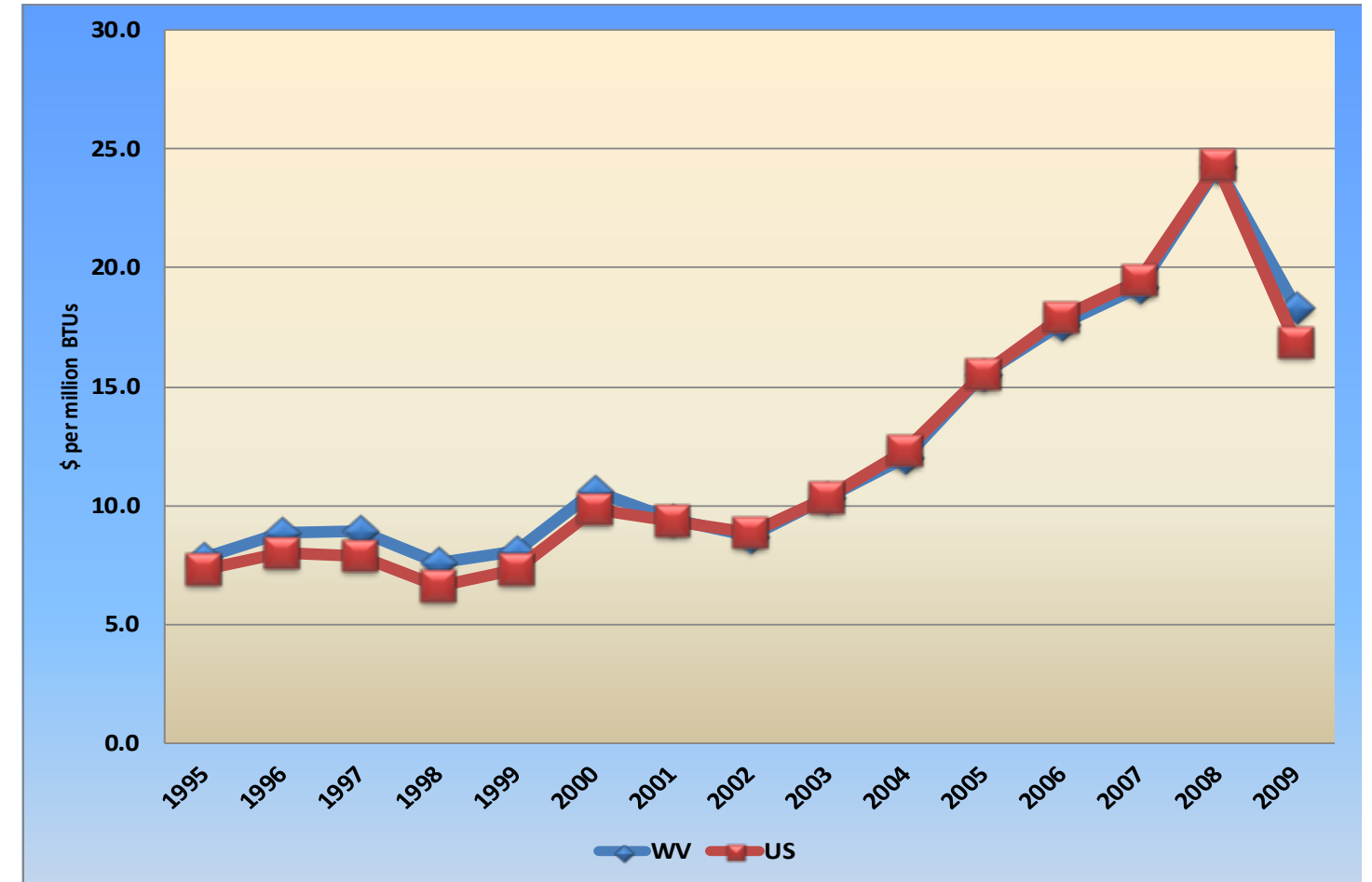
Natural Gas - Residential (\$ per million BTU) 1994 - 2009



	WV	US
1994	6.26	6.23
1995	6.64	5.89
1996	6.62	6.16
1997	6.38	6.75
1998	6.86	6.61
1999	7.03	6.50
2000	6.98	7.64
2001	7.50	9.42
2002	7.94	7.69
2003	8.91	9.24
2004	10.31	10.47
2005	12.18	12.34
2006	14.06	13.35
2007	13.58	12.72
2008	13.50	13.50
2009	13.63	11.81

WV Energy Price History

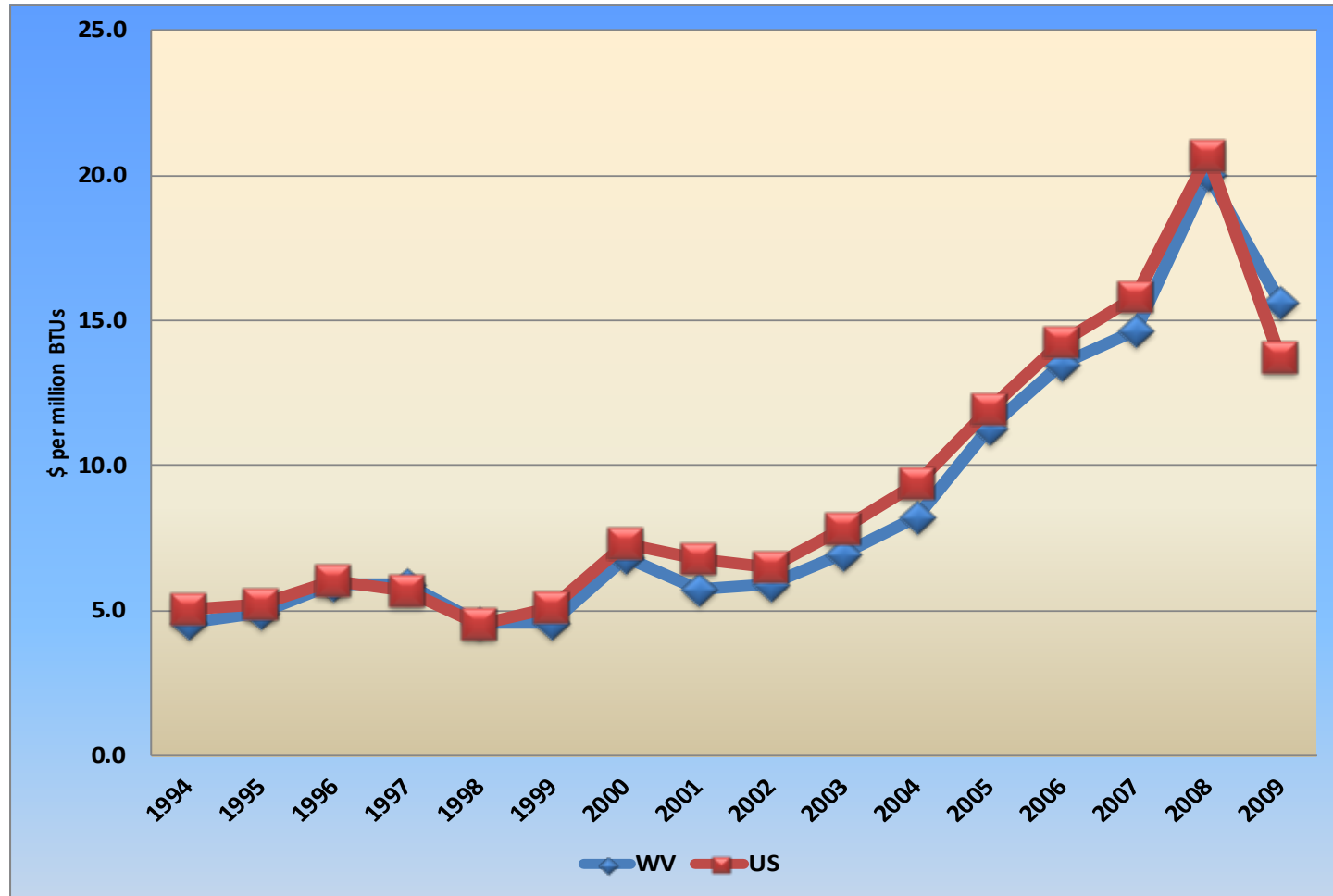
Petroleum - Total (Dollars per million BTU) 1995 - 2009



	WV	US
1995	7.83	7.28
1996	8.87	8.01
1997	8.94	7.86
1998	7.59	6.63
1999	8.07	7.33
2000	10.63	9.82
2001	9.39	9.32
2002	8.74	8.83
2003	10.37	10.31
2004	12.05	12.27
2005	15.55	15.53
2006	17.61	17.92
2007	19.22	19.46
2008	24.28	24.29
2009	18.35	16.86

WV Energy Price History

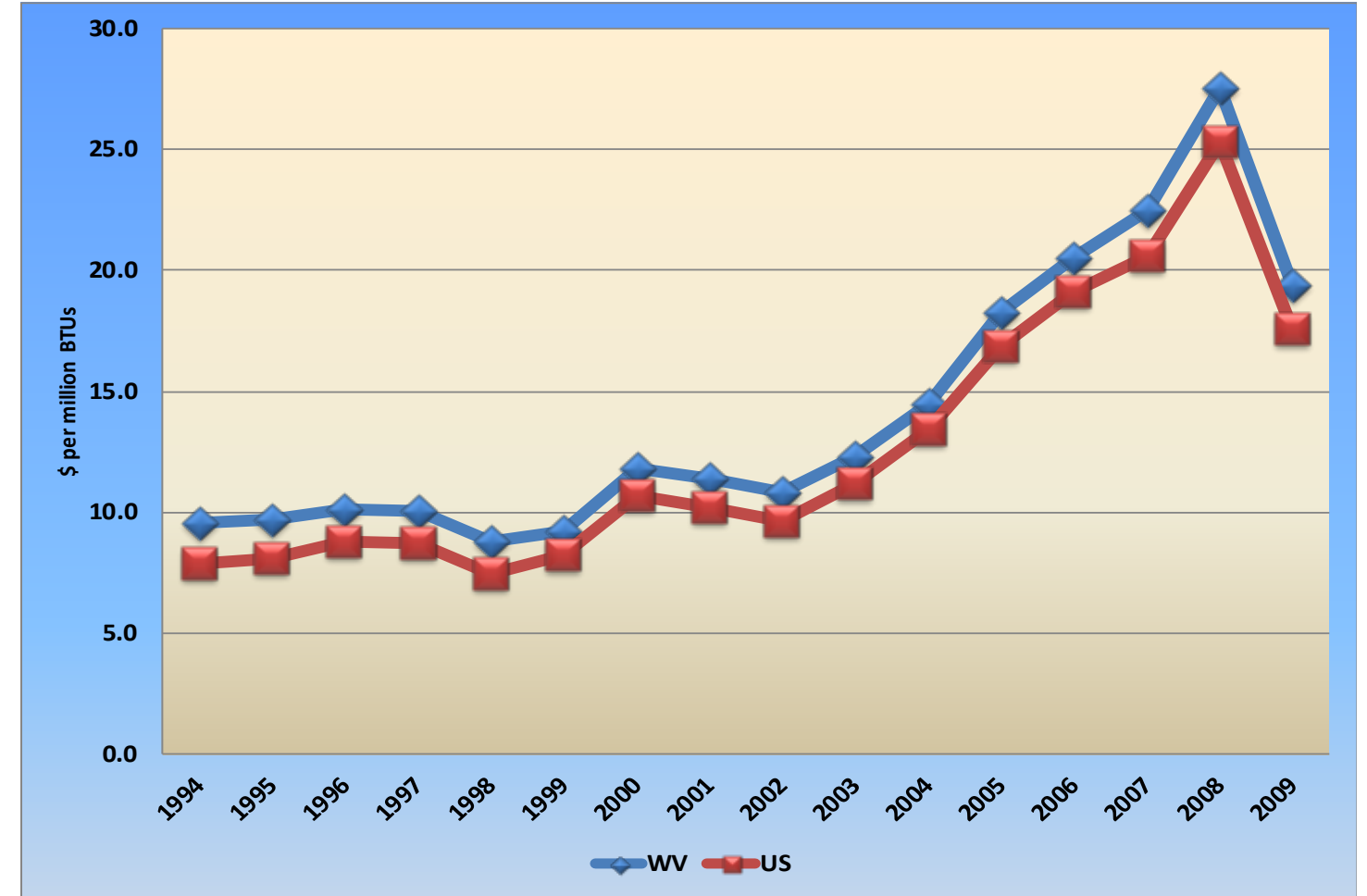
Petroleum- Industrial (Dollars per million BTU) 1994 - 2009



	WV	US
1994	4.57	5.04
1995	4.93	5.20
1996	5.90	6.05
1997	5.91	5.69
1998	4.59	4.53
1999	4.60	5.08
2000	6.86	7.30
2001	5.75	6.77
2002	5.89	6.46
2003	6.97	7.81
2004	8.24	9.36
2005	11.32	11.93
2006	13.48	14.25
2007	14.63	15.79
2008	20.04	20.65
2009	15.62	13.75

WV Energy Price History

Petroleum - Transportation (\$ per million BTU) 1994 - 2009

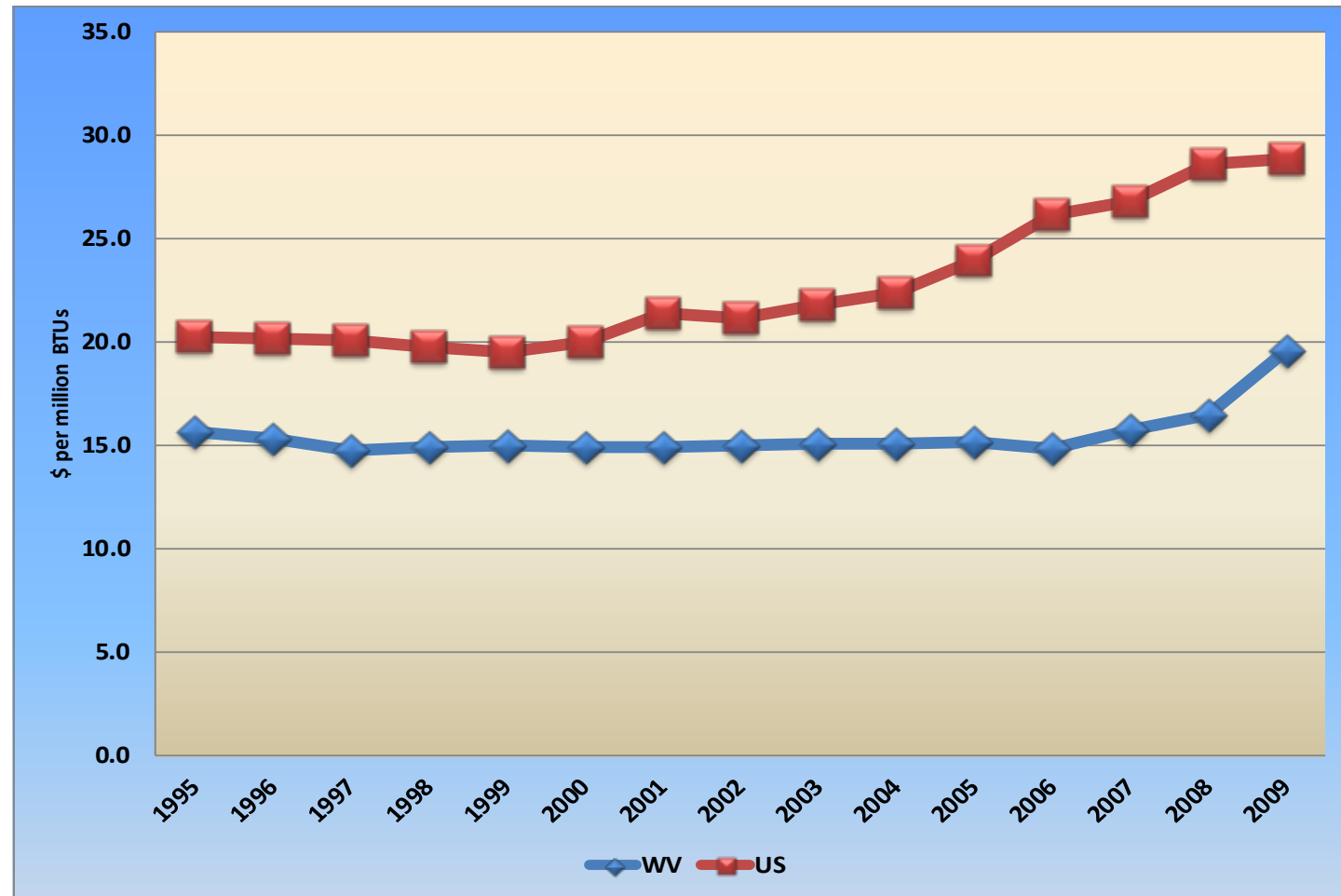


	WV	US
1994	9.56	7.91
1995	9.71	8.08
1996	10.14	8.76
1997	10.08	8.69
1998	8.76	7.47
1999	9.24	8.23
2000	11.81	10.71
2001	11.40	10.20
2002	10.85	9.64
2003	12.33	11.20
2004	14.49	13.43
2005	18.26	16.89
2006	20.50	19.13
2007	22.47	20.61
2008	27.53	25.31
2009	19.37	17.54

WV Energy Price History

Electricity- Total (Dollars per million BTU)

1995 - 2009

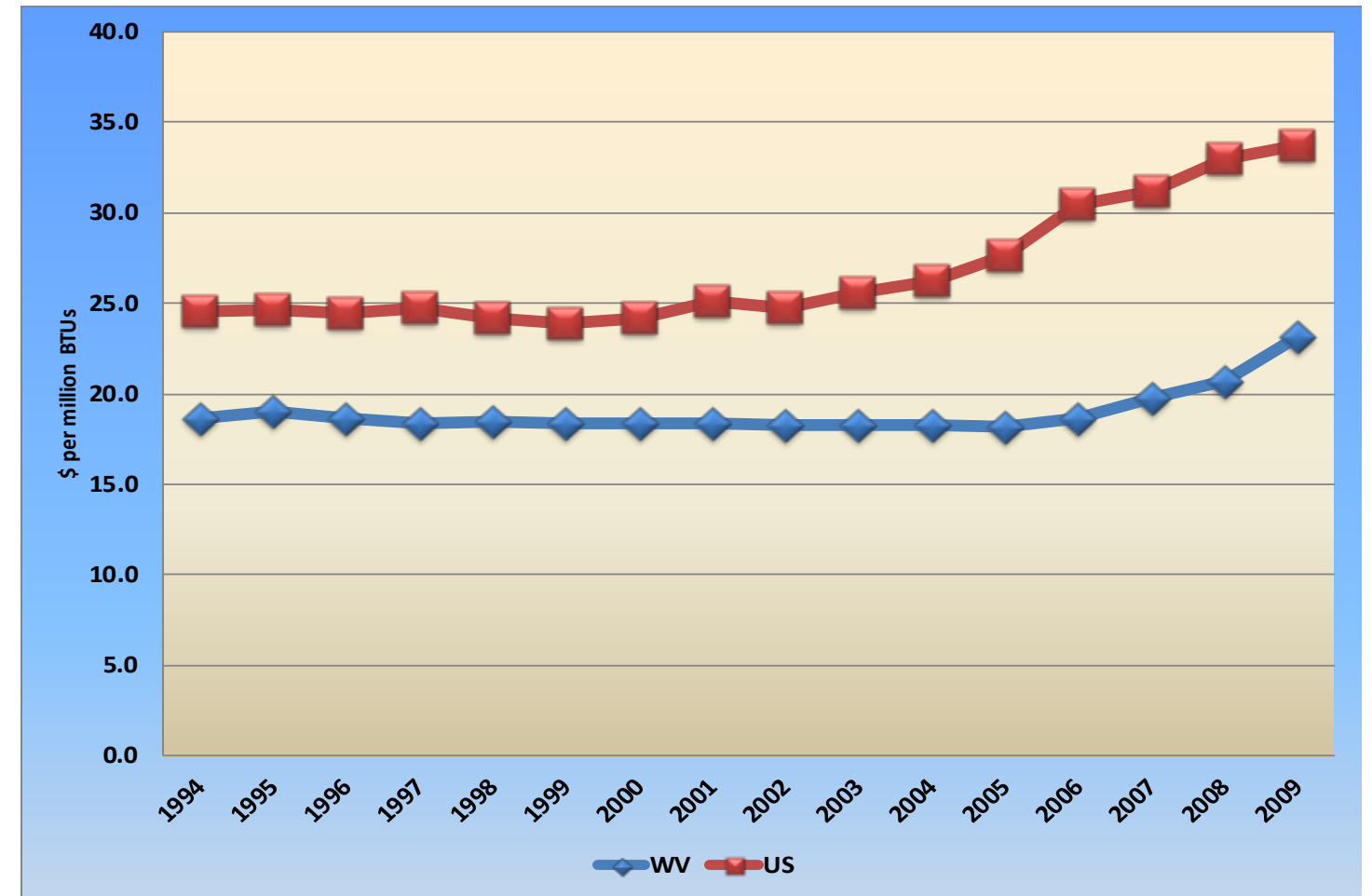


	WV	US
1995	15.68	20.29
1996	15.32	20.16
1997	14.75	20.13
1998	14.91	19.80
1999	14.97	19.52
2000	14.91	20.03
2001	14.9	21.41
2002	15.02	21.15
2003	15.06	21.85
2004	15.09	22.38
2005	15.18	23.92
2006	14.84	26.15
2007	15.72	26.84
2008	16.52	28.64
2009	19.56	28.90

WV Energy Price History

Electricity - Residential (\$ per million BTU)

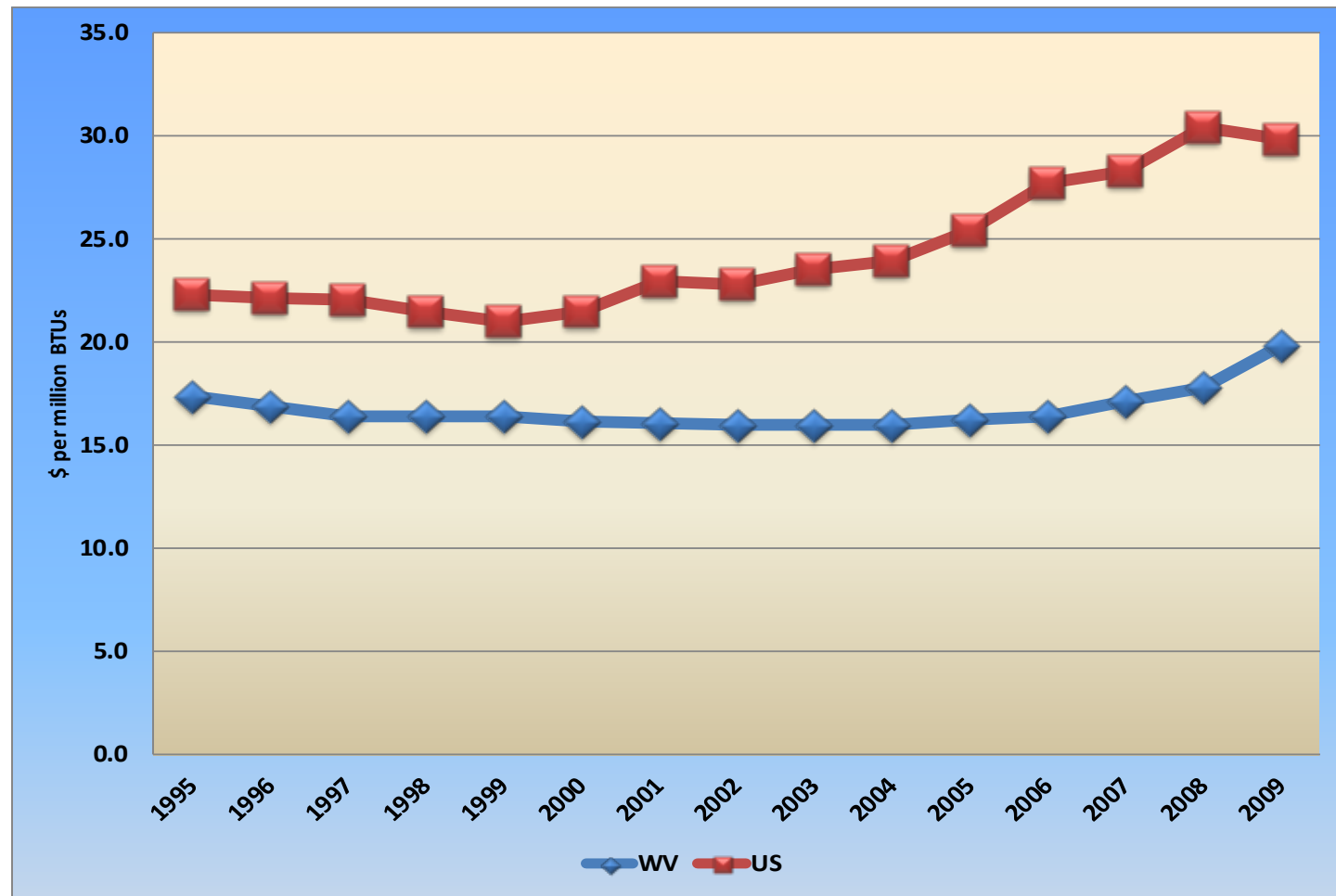
1994 - 2009



	WV	US
1994	18.65	24.57
1995	19.05	24.63
1996	18.69	24.50
1997	18.34	24.71
1998	18.45	24.21
1999	18.39	23.93
2000	18.36	24.14
2001	18.35	25.16
2002	18.27	24.75
2003	18.29	25.56
2004	18.25	26.22
2005	18.19	27.68
2006	18.62	30.49
2007	19.73	31.22
2008	20.70	33.01
2009	23.16	33.72

WV Energy Price History

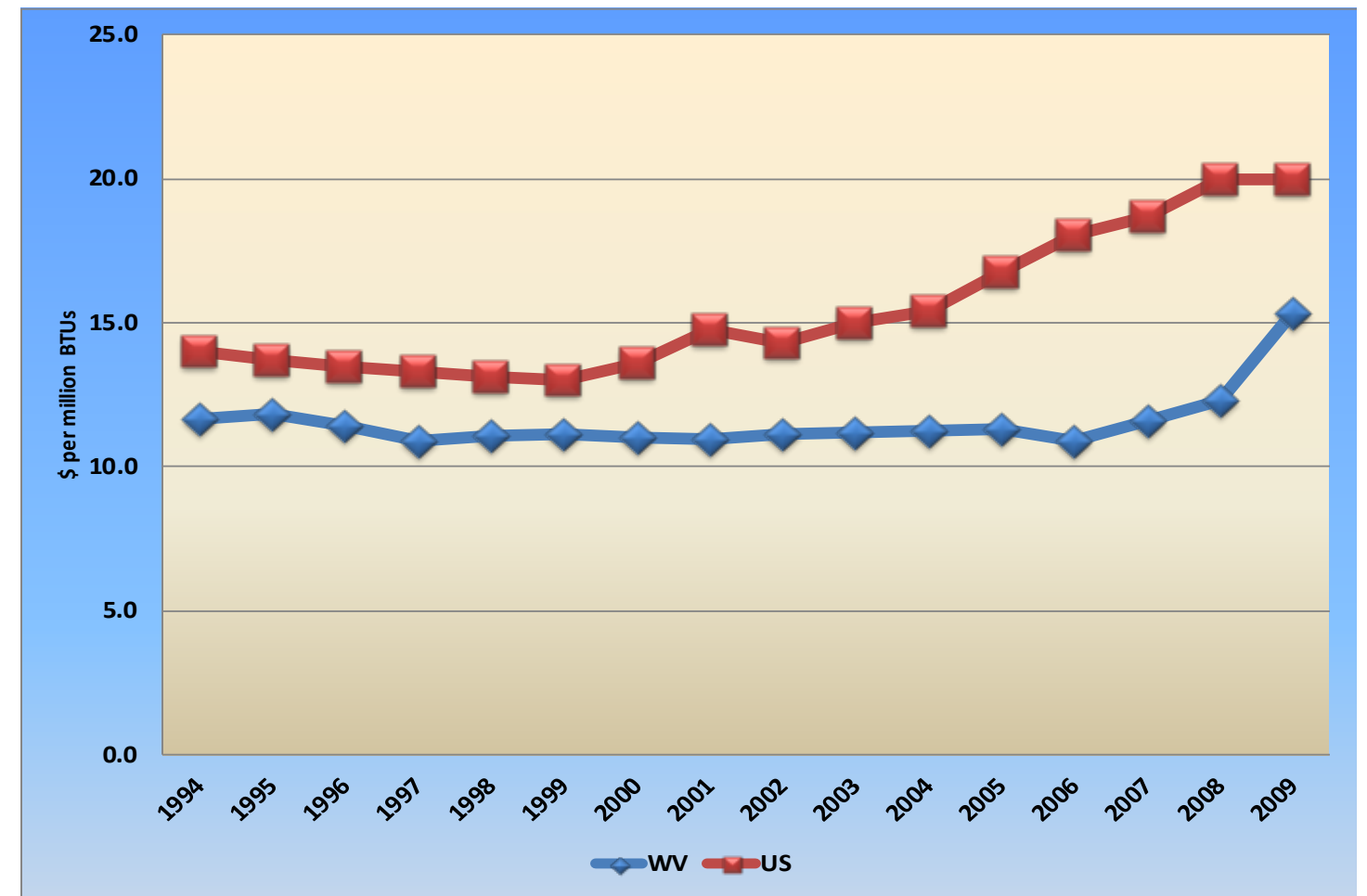
Electricity - Commercial (\$ per million BTU) 1995 - 2009



	WV	US
1995	17.35	22.29
1996	16.90	22.17
1997	16.39	22.03
1998	16.44	21.48
1999	16.37	21.01
2000	16.13	21.52
2001	16.10	22.99
2002	16.00	22.81
2003	15.98	23.54
2004	16.01	23.95
2005	16.21	25.40
2006	16.39	27.72
2007	17.14	28.27
2008	17.81	30.38
2009	19.83	29.81

WV Energy Price History

Electricity - Industrial (\$ per million BTU) 1994 - 2009



	WV	US
1994	11.67	14.00
1995	11.82	13.68
1996	11.45	13.49
1997	10.87	13.29
1998	11.07	13.13
1999	11.15	12.98
2000	11.03	13.60
2001	10.96	14.78
2002	11.15	14.30
2003	11.18	14.97
2004	11.22	15.38
2005	11.28	16.77
2006	10.87	18.02
2007	11.59	18.71
2008	12.32	19.96
2009	15.37	20.00

Sources

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