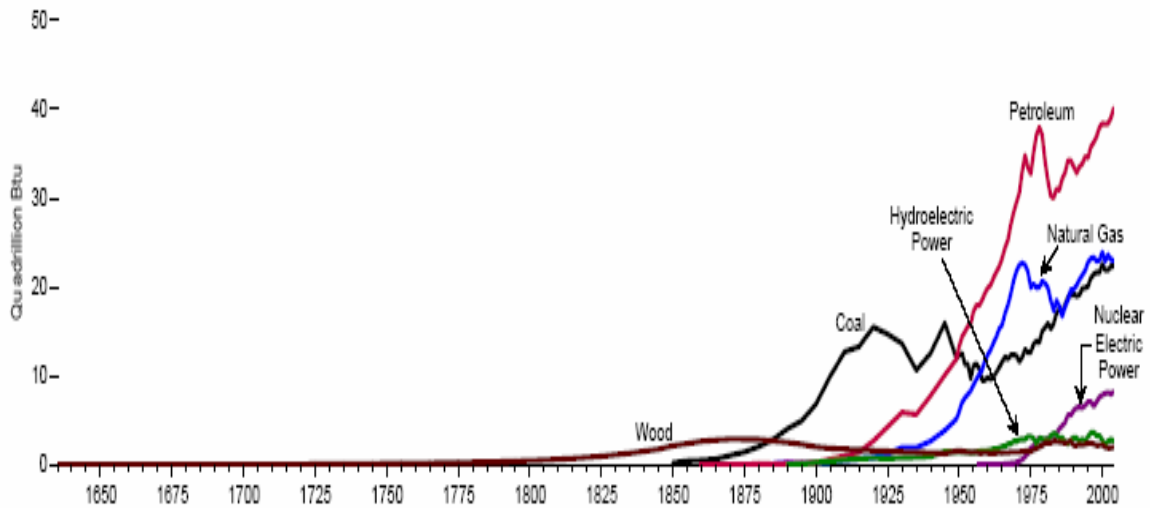


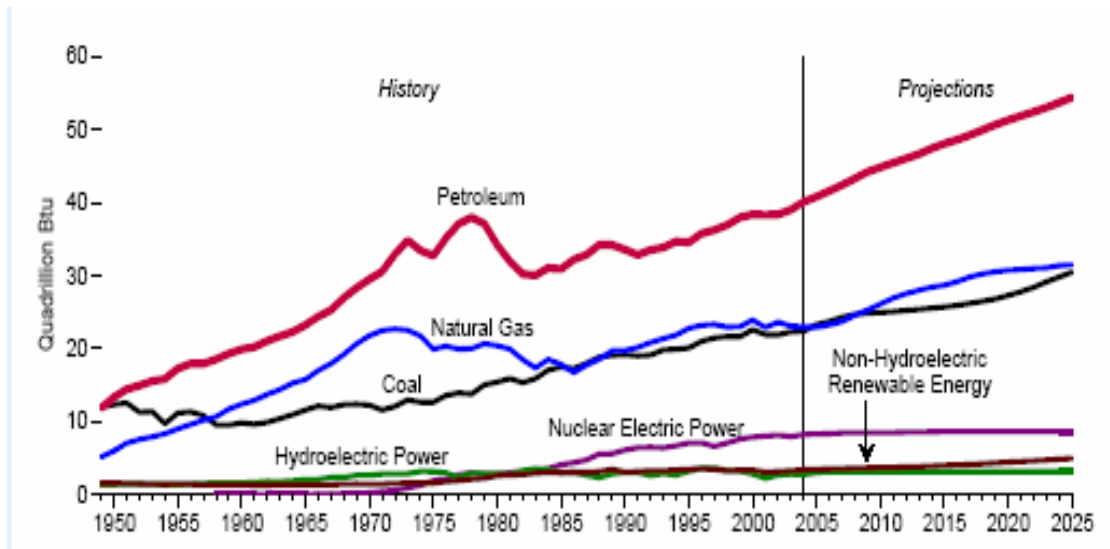
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Figure 1: U.S. Energy Consumption By Source, 1635 -2004



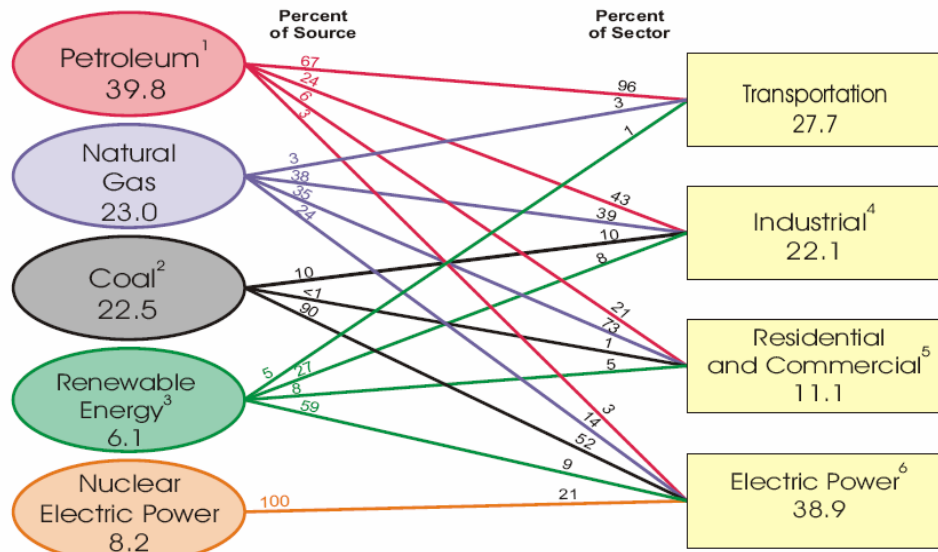
Source: IEA (2005a), Figure5.

Figure 2: Energy Consumption History and Outlook, 1949 - 2025



Source: EIA (2005a), Figure 6.

**Figure 3: U.S. Primary Energy Consumption by Source and Sector, 2004  
(Quadrillion Btu)**



<sup>1</sup>Excludes 0.3 quadrillion Btu of ethanol, which is included in "Renewable Energy."  
<sup>2</sup>Includes coal coke net imports.  
<sup>3</sup>Conventional hydroelectric power, wood, waste, alcohol, geothermal, solar, and wind.  
<sup>4</sup>Includes industrial combined-heat-and-power (CHP) and industrial electricity-only plants.  
<sup>5</sup>Includes commercial combined-heat-and-power (CHP) and commercial electricity-only plants.

<sup>6</sup>Electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public.  
 Note: Sum of components may not equal 100 percent due to independent rounding.  
 Source: Energy Information Administration, *Annual Energy Review 2004*, Tables 1.3 and 2.1b-2.1f.

Source: DOE (2005b)

**Table 1: U.S. Energy Production from Renewable Sources, 2004**

Renewables	2004 Production		Use by Sector				
	Quads	%	Residential	Commercial	Industrial	Transportation	Electrical
Hydroelectric	2.725	44		0.001	0.051		2.673
Wood	1.989	33	0.332	0.041	1.448		0.168
Waste	0.560	10		0.048	0.172		0.340
Alcohol	0.296	5				0.296	
Geothermal	0.340	5	0.018	0.015	0.005		0.302
Wind	0.143	1					0.143
Solar	0.063	2		0.057			0.006
Total	6.116	100	0.407	0.105	1.676	0.296	3.632

Source: U.S. Department of Energy, (2005b) Tables 10.2a and 10.2b.

**Table 2: Electricity, Gasoline and Diesel Use during 2004 and the Proportion from Renewables**

	2004 Consumption	Amount from Renewables	% from Renewables
Gasoline (Bill Gal.)	136.008	3.4	2.5
Diesel (Bill. Gal.)	42.525	0.025	0.06
Electricity (Bill. Kwh)	3,953	358.8	9.08
Hydroelectric		269.6	6.82
Wood		37.3	0.94
Waste		22.7	0.57
Geothermal		14.4	0.36
Wind		14.2	0.36
Solar		0.6	0.02

Source: U.S. Department of Energy (2005a) Tables 5.13c and 8.2a.

**Table 3: U.S. Energy Used by Source of Fuel, 2004 and Projection for 2025**

Source	2004		2025 Projection	
	Quads	%	Quads	%
Petroleum	39.8	40.0	54.4	40.8
Natural Gas	23.0	23.1	31.5	23.7
Coal	22.5	22.6	30.5	22.9
Nuclear Power	8.2	8.2	8.7	6.5
Renewables	6.1	6.1	8.1	6.1
Total	99.6	100.0	133.2	100.0

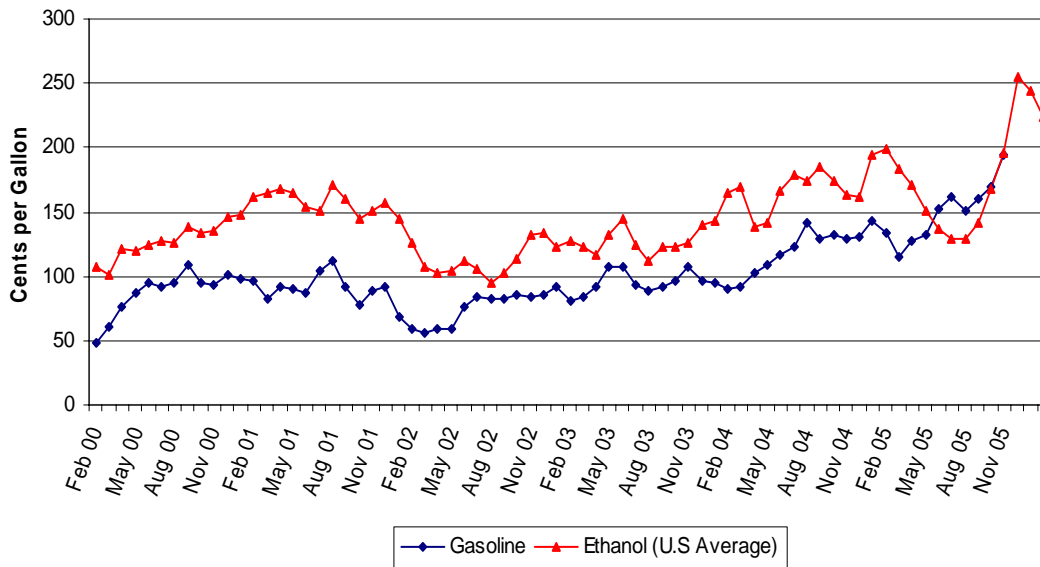
Source: U.S. Department of Energy (2005a) Table 1.

**Table 4: U.S. Energy Consumption by Sector, 2004 and projections for 2025**

	2004		Projections for 2025	
	Quads	%	Quads	%
Transportation	27.7	27.8	39.9	30.0
Industrial	22.1	22.1	26.4	19.8
Residential & Commercial	11.1	11.1	13.4	10.1
Electrical	38.9	39.0	53.4	40.1
Total	99.8	100.0	133.1	100.0

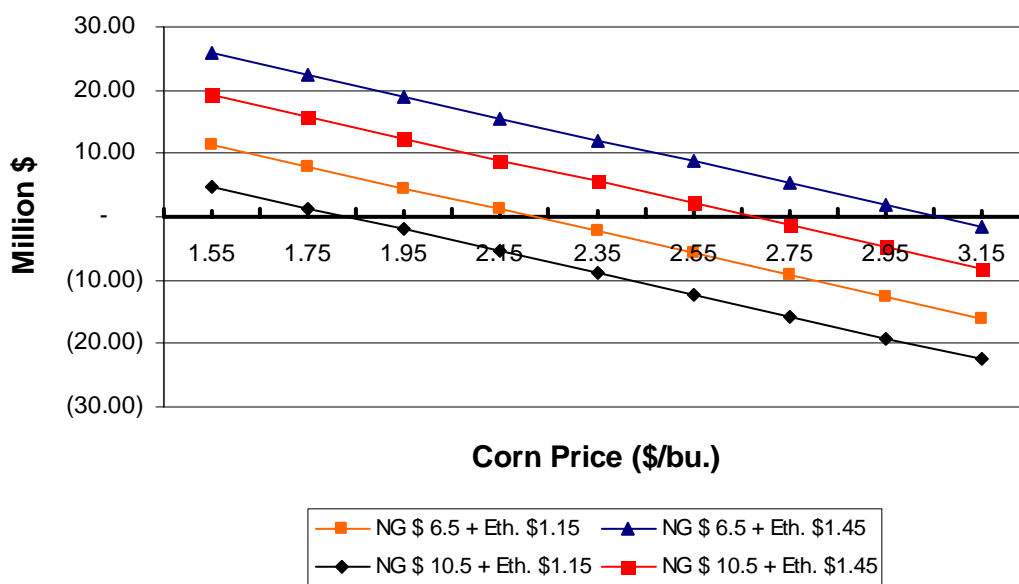
Source: U.S. Department of Energy (2005a) Table 2.

**Figure 4: Rack Ethanol and Wholesale Regular Gasoline 1998 - November 2005**



Source: Hart Energy Publishing LLP and EIA.

**Figure 5: Net Margin for 48 MMGPY Dry Mill Plant for Selected Corn, Ethanol and Natural Gas Price Combinations**



**Table 5: U. S. Ethanol Use 2003 and 2004**

Market Segment	2003		2004	
	Million Gallons	%	Million Gallons	%
Oxy-Fuel Program	250	9	290	8
Reformulated Gasoline Program	1,350	48	1,950	55
Octane booster and Blending	950	34	1,050	29
State Mandate (MN)	260	9	280	8
<b>Total</b>	<b>2,810</b>	<b>100</b>	<b>3,570</b>	<b>100</b>

Source: Renewable Fuels Association

**Table 6: Estimated Production Cost per Gallon of Denatured Ethanol produced from Lignocellulosic Biomass Based on Aden, et. Al., Appendix D**

Conversion Rate Gallons/ Ton	Cost of Feedstock \$/ Ton	Enzyme Cost Per Gal	Plant Output Million Gallons / Year		Cost/Gal. Denatured	Investment Cost/Gal. Denatured
			Anhydrous	Denatured		
<b>Base Case</b>						
<b>67.8</b>	30	0.10	52.3	53.4	1.39	3.70
		0.20			1.49	
	50	0.10			1.68	
		0.20			1.78	
<b>Future Case 89.7</b>	30	0.10	69.3	70.7	1.05	2.79
		0.20			1.15	
	50	0.10			1.27	
		0.20			1.37	

**Table 7. Biodiesel Costs for a 10 mmgpy Plant**

Biodiesel From Soybean Oil Cost Per Gallon			Biodiesel From Yellow Grease Cost Per Gallon		
Degummed Soybean Oil \$/lb.	w/o Tax Credit	w/\$1.00/G al. tax Credit	Yellow Grease \$/lb.	w/o Tax Credit	w/\$0.50/ Gal. Tax Credit
\$0.15	\$1.48	\$0.48	\$0.074	\$0.94	\$0.44
0.20	1.85	0.85	0.098	1.12	0.62
0.25	2.22	1.22	0.122	1.31	0.81
0.30	2.60	1.60	0.147	1.50	1.00
0.35	2.96	1.96	0.168	1.68	1.18

**Table 8. U.S. Supply of Biodiesel Feedstocks**

<b>Oil Type</b>	<b>Million Pounds*</b>	<b>Million Gallons**</b>
<b>Crops</b>		
Soybean Oil	18,309	2,378
Cottonseed Oil	847	110
Sunflower Oil	558	72
Peanut Oil	84	11
Corn Oil	2,436	316
Canola Oil	603	78
<b>Total</b>	<b>22,436</b>	<b>2,965</b>
<b>Other</b>		
Yellow Grease & Grease	2,656	345
Lard	1,090	142
Edible Tallow	1,894	246
Inedible tallow	3,696	480
<b>Total</b>	<b>9,336</b>	<b>1,213</b>
<b>Total Supply</b>	<b>32,173</b>	<b>4,178</b>
<p>* Pounds of oil are a five year average (2000-2004) from Bureau of the Census and Agricultural Marketing Service, USDA. The pounds of yellow grease and inedible tallow are a two-year average for 2002-2003 from US Department of Commerce, US Census Bureau. <i>Current Industrial Report</i>, M311K (03)-13, March 2005.</p> <p>** Pounds are converted to gallons of oil using a 7.7 pounds to gallons conversion ratio.</p>		

**Table 9. US Vegetable Oils and Fats Prices (cents per pound)**

<b>Marketing Year</b>	<b>Soybean Oil</b>	<b>Cottonseed Oil</b>	<b>Sunflower Oil</b>	<b>Peanut Oil</b>	<b>Corn Oil</b>	<b>Lard</b>	<b>Edible Tallow</b>	<b>Canola Oil</b>
2000/01	14.15	15.98	15.89	34.97	13.54	14.16	13.43	17.56
2001/02	16.46	17.98	23.25	32.23	19.14	13.55	13.87	23.45
2002/03	22.04	37.75	33.11	46.70	28.17	18.13	17.80	29.75
2003/04	29.97	31.21	33.41	60.84	28.43	26.13	22.37	33.76
2004/05*	22.75	26.25	43.75	53.75	28.25	22.75	19.50	29.03
* Preliminary								

Source: Ash, M and Dolman, E (June 13, Oil Crops Outlook, OCS-05e. USDA, Economic Research Service.

**Table 10: U.S. Wind Energy Capacity and Production, 2000 – 2005**

	<b>Installed Capacity<sup>a</sup></b>	<b>Production</b>		<b>Capacity</b>
Year	Megawatts	Million Megawatt-hours <sup>b</sup>	Quads <sup>c</sup>	Factor <sup>d</sup>
2000	2,578	5.6	0.057	0.25
2001	4,275	6.7	0.070	0.18
2002	4,685	10.4	0.105	0,25
2003	6,372	11.2	0.115	0.20
2004	6,740	14.2	0.143	0.24
2005	9240	NA	NA	NA
<sup>a</sup> Source: American Wind Association.2005b. U.S. Installed Capacity 1981 – 2004. The estimate for 2005 is from American Wind Association. 2005c.				
<sup>b</sup> Source: DOE, 2005a. Annual Energy Outlook 2005, Table 8.2a.				
<sup>c</sup> Source: DOE, 2005 a. Table 8.4 a				
<sup>d</sup> Computed from Columns 2 and 3.				

**Table 11: Net Generation By State, 2003**

<b>State</b>	<b>Megawatt hours</b>
California	3,845
Texas	2,570
Iowa	982
Minnesota	978
Washington	604
Oregon	444
Wyoming	366
Kansas	366
New Mexico	183
West Virginia	170
Colorado	147
Others	482
Total	11,187

Source: DOE, (2005c), Table 20.

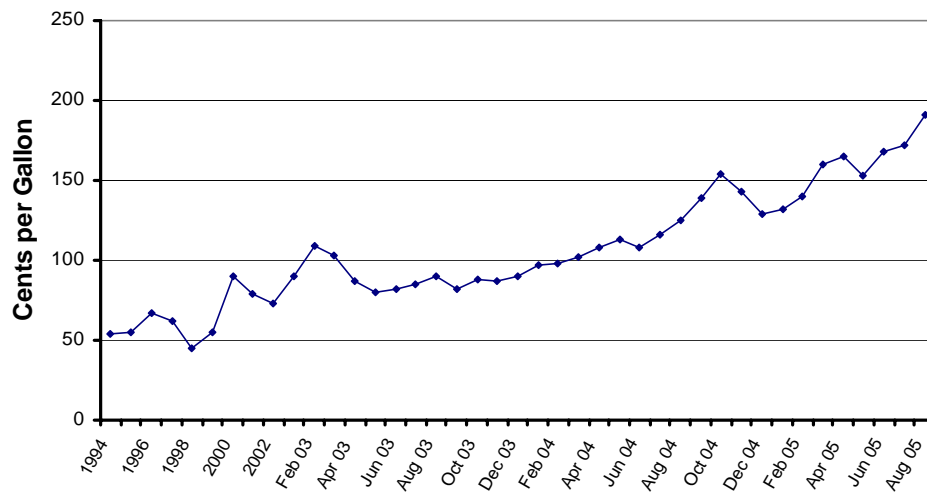


**Table 12: Comparative Emissions in Pounds per Kilowatt-hour Generated in the U.S.**

<b>Fuel</b>	<b>CO<sub>2</sub></b>	<b>SO<sub>2</sub></b>	<b>NO<sub>x</sub></b>
Coal	2.13	0.0134	0.0076
Natural Gas	1.03	0.000007	0.0018
Oil	1.56	0.0112	0.0021
U.S. Average Mix	1.52	0.008	0.0409
Wind	0	0	0

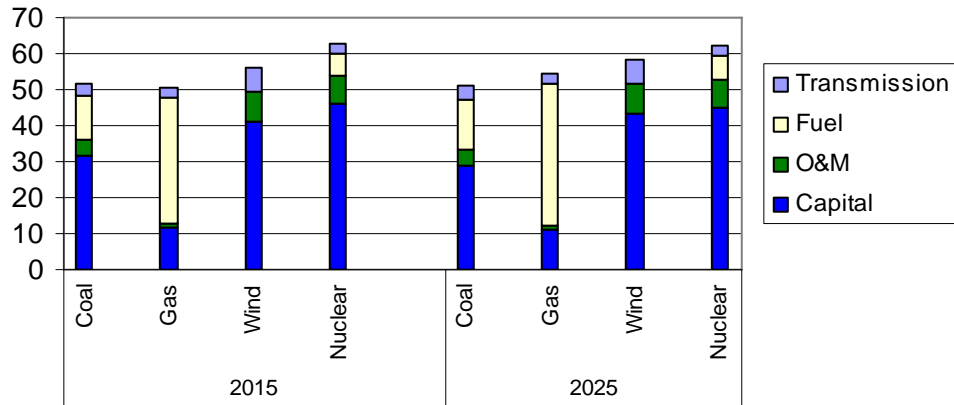
Source: DOE (1998).

**Figure 6: Wholesale Diesel Fuel Prices, 1994-2005**



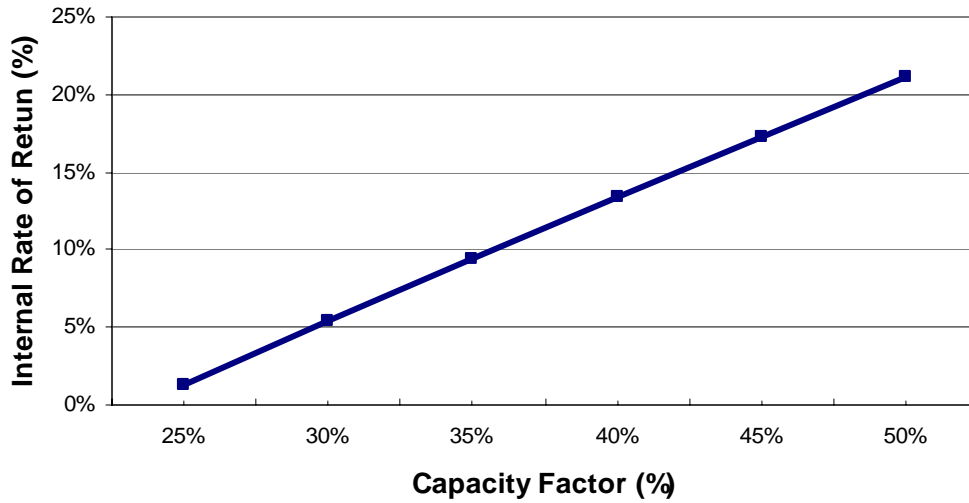
Source: Energy Information Administration.

**Figure 7: Levelized electricity costs for new plants, 2015 and 2025 (2003 mills per kilowatthour)**



Source: DOE, (2005a), Figure 71.

**Figure 8: Internal Rates of Return for Wind Sites with Capacity Factors from 25-50% and Based on Assumptions of Revenues and Costs**



Source: Tiffany (2005), p37.

**Table 13: Summary of Potential Energy Production Based on Three Existing Studies**

Source	Units	Production		Quads
		No. Units	% of 2004 Use	
<b>Grain Ethanol</b>	Bill. Gal.	7.0		
<b>Lignocellulosic Ethanol</b>	Bill. Gal.	23.9		
<b>Total Ethanol</b>	Bill. Gal.	30.9	22.7	2.35
<b>Biodiesel</b>	Mill. Gal.	260	0.6	0.03
<b>Lignocellulosic Electricity</b>	Mill. Megawatt Hrs.	53.4		
<b>Wind Energy</b>	Mill. Megawatt Hrs.	237.2		
<b>Total Electricity</b>	Mill. Megawatt Hrs.	290.6	7.35	2.96
<b>Total Quads</b>				5.34