

# **U.S. Energy Scenarios**

for the **21<sup>st</sup> Century:**

Appendix C: Detailed Model Output

**Prepared for the Pew Center on Global Climate Change**

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GLOBAL BUSINESS NETWORK

*July 2003*

**Pew Center  
Year 2010 Comparisons**

	Historical 2000	Technology Triumphs			Turbulent World			Awash in Oil and Gas		
		Base	Policy	% Change	Base	Policy	% Change	Base	Policy	% Change
<b>I. OVERVIEW DATA</b>										
<b>Macroeconomic Variables (billions of 2000\$)</b>										
Real Consumption	\$6,699	\$9,161	\$9,125	-0.4%	\$7,904	\$7,844	-0.8%	\$9,149	\$9,034	-1.3%
Real Investment	\$1,898	\$2,959	\$2,980	0.7%	\$2,680	\$2,707	1.0%	\$2,962	\$3,007	1.5%
Real Government Purchases	\$1,684	\$2,084	\$2,087	0.1%	\$2,084	\$2,087	0.1%	\$2,084	\$2,088	0.2%
Real Exports	\$1,213	\$2,292	\$2,292	0.0%	\$2,282	\$2,282	0.0%	\$2,292	\$2,291	0.0%
Real Imports	\$1,620	\$2,772	\$2,776	0.1%	\$2,545	\$2,551	0.2%	\$2,766	\$2,756	-0.4%
<b>TOTAL REAL GDP</b>	<b>\$9,873</b>	<b>\$13,723</b>	<b>\$13,707</b>	<b>-0.1%</b>	<b>\$12,405</b>	<b>\$12,370</b>	<b>-0.3%</b>	<b>\$13,721</b>	<b>\$13,664</b>	<b>-0.4%</b>
<b>Program Spending (billions of 2000\$)</b>										
Deployment Programs	\$0.00	--	\$1.20	--	--	\$1.30	--	--	\$1.50	--
Technology R&D	\$0.00	--	\$1.80	--	--	\$1.90	--	--	\$1.80	--
<b>Macroeconomic Investment Components</b>										
<b>Aggregate Investment Totals (billions of 2000\$)</b>										
Electric Utility	\$4	\$12	\$11	-9.6%	\$15	\$11	-27.9%	\$14	\$15	7.8%
Infrastructure	\$0	\$25	\$18	-30.3%	\$22	\$5	-76.8%	\$24	-\$34	-238.1%
Efficient Equipment	\$213	\$252	\$277	9.7%	\$258	\$282	9.6%	\$248	\$287	15.5%
Vehicle Purchases	\$384	\$655	\$454	-30.8%	\$451	\$455	1.0%	\$466	\$442	-5.1%
<b>TOTAL ENERGY-RELATED INVESTMENT</b>	<b>\$601</b>	<b>\$944</b>	<b>\$758</b>	<b>-19.7%</b>	<b>\$746</b>	<b>\$754</b>	<b>1.0%</b>	<b>\$753</b>	<b>\$711</b>	<b>-5.6%</b>
<b>Detailed Investment Totals (billions of 2000\$)</b>										
Electric Facilities - Fossil	\$4	\$8	\$5	-38.4%	\$12	\$6	-53.5%	\$13	\$6	-54.8%
Renewable Electricity	\$0	\$4	\$6	43.2%	\$4	\$6	57.7%	\$1	\$10	611.1%
Distributed Generation	\$0	\$4	\$5	7.7%	\$2	\$4	129.3%	\$3	\$4	44.5%
Hydrogen Infrastructure	\$0	\$0	\$6	--	\$0	\$8	--	\$0	\$2	--
Fuel Supply	\$0	\$21	\$21	-2.2%	\$20	\$20	-1.9%	\$22	\$21	-3.7%
Sequestration Investment	\$0	\$0	\$0	--	\$0	\$0	--	\$0	\$0	--
Residential Efficient Equip.	\$77	\$92	\$97	5.7%	\$94	\$99	6.2%	\$91	\$99	9.2%
Commercial Efficient Equip.	\$72	\$84	\$90	6.9%	\$85	\$92	7.4%	\$83	\$92	11.3%
Industrial Efficient Equip.	\$64	\$76	\$89	17.7%	\$79	\$91	15.8%	\$75	\$95	27.8%
Freight & Air Efficiency	\$0	\$0	\$8	--	\$0	\$8	--	\$0	\$9	--
Business Light-Duty Vehicles	\$173	\$203	\$200	-1.5%	\$203	\$201	-0.7%	\$210	\$195	-7.0%
Non-Energy Production	0									
<b>Expenditures on Imported Oil and Gas (billions of 2000\$)</b>										
Crude Oil Imports	\$92	\$87	\$86	-1.3%	\$223	\$222	-0.3%	\$91	\$89	-1.5%
Petroleum Product Imports	\$31	\$33	\$30	-9.7%	\$77	\$74	-3.9%	\$44	\$41	-8.7%
Natural Gas Imports	\$10	\$14	\$16	10.1%	\$22	\$23	2.8%	\$15	\$17	7.4%
<b>Light-Duty Vehicle Purchases (billions of 2000\$)</b>										
Household Vehicles	\$211	\$249	\$245	-1.4%	\$248	\$246	-0.7%	\$257	\$239	-7.0%
Business Light-Duty Vehicles	\$173	\$203	\$200	-1.5%	\$203	\$201	-0.7%	\$210	\$195	-7.0%
<b>TOTAL LIGHT-DUTY VEHICLES (LDVs)</b>	<b>\$384</b>	<b>\$452</b>	<b>\$445</b>	<b>-1.5%</b>	<b>\$451</b>	<b>\$447</b>	<b>-0.7%</b>	<b>\$466</b>	<b>\$434</b>	<b>-7.0%</b>
Avg Price per Vehicle	\$22,097	\$24,999	\$24,978	-0.1%	\$25,302	\$25,268	-0.1%	\$24,231	\$24,201	-0.1%

**Pew Center  
Year 2010 Comparisons**

	Historical 2000	Technology Triumphs			Turbulent World			Awash in Oil and Gas		
		Base	Policy	% Change	Base	Policy	% Change	Base	Policy	% Change
<b>Energy Expenditures by Major Sector (billions of 2000\$)</b>										
Residential	\$144	\$146	\$177	20.7%	\$167	\$194	16.5%	\$147	\$192	30.2%
Commercial	\$118	\$114	\$141	23.8%	\$131	\$156	18.4%	\$114	\$155	35.3%
Industrial	\$183	\$186	\$240	28.9%	\$227	\$257	13.4%	\$199	\$284	42.7%
Transportation	\$264	\$320	\$334	4.5%	\$538	\$540	0.4%	\$336	\$360	7.0%
TOTAL ECONOMY-WIDE EXPENDITURES	\$709	\$767	\$893	16.4%	\$1,063	\$1,147	7.9%	\$797	\$990	24.3%
Average Primary Energy Price (\$/MBtu)	\$7.07	\$6.82	\$8.18	19.9%	\$9.60	\$10.60	10.4%	\$6.90	\$8.87	28.6%
<b>Energy Consumption (Quads)</b>										
Petroleum Products	38.1	43.4	42.4	-2.4%	42.7	42.2	-1.2%	46.1	45.2	-2.0%
Natural Gas	23.4	28.9	29.6	2.6%	27.2	27.4	0.8%	30.5	31.0	1.9%
Coal	23.4	25.0	21.8	-12.8%	25.5	23.3	-8.6%	24.7	20.3	-17.9%
Renewable Energy	6.9	7.4	7.8	5.3%	7.3	7.7	5.6%	6.9	7.8	12.5%
Nuclear Power	8.1	7.5	7.3	-2.5%	7.7	7.7	-0.1%	6.9	7.0	0.7%
Other	0.4	0.4	0.4	0.0%	0.4	0.4	0.0%	0.4	0.4	0.0%
TOTAL PRIMARY ENERGY	100.3	112.4	109.2	-2.9%	110.7	108.6	-1.9%	115.5	111.6	-3.4%
TPE / GDP (kBtu / 2000\$)	10.2	8.19	7.96	-2.8%	8.92	8.78	-1.6%	8.42	8.17	-3.0%
<b>Carbon Emissions (MtC)</b>										
Transportation Carbon	511	633	612	-3.3%	611	604	-1.1%	658	635	-3.5%
End Use Carbon	458	506	498	-1.6%	488	490	0.4%	529	511	-3.4%
Central Station Carbon	589	668	606	-9.3%	683	626	-8.3%	687	604	-12.1%
Captured & Sequestered	0	0	0	--	0	0	--	0	0	--
ECONOMY-WIDE CARBON EMISSIONS	1,559	1,807	1,716	-5.0%	1,782	1,720	-3.5%	1,875	1,750	-6.7%
Carbon-to-GDP Ratio (grams / 2000\$)										
Emissions per \$ Output	158	132	125	-5.3%	144	139	-3.5%	137	128	-6.6%
<b>II. ENERGY PRICE AND SUPPLY</b>										
<b>Carbon Charge (2000\$)</b>										
Carbon Price (\$/metric ton)	\$0	--	\$137	--	--	\$146	--	--	\$204	--
Carbon Price in Gas (\$/MBtu)	\$0	--	\$2	--	--	\$2	--	--	\$3	--
Carbon Price in Coal (\$/MBtu)	\$0	--	\$3	--	--	\$4	--	--	\$5	--
<b>Oil Prices (2000\$)</b>										
World Oil Price (2000\$/bbl)	\$27.70	\$22.90	\$22.70	-0.9%	\$58.60	\$58.60	0.0%	\$23.20	\$23.00	-0.9%
Crude Oil Price (2000\$/MBtu)	\$4.66	\$3.84	\$3.82	-0.5%	\$9.86	\$9.85	-0.1%	\$3.90	\$3.87	-0.8%
<b>Petroleum Supply (Quads)</b>										
Domestic Crude Oil	15.0	14.5	14.4	-0.7%	14.4	14.3	-0.3%	14.8	14.7	-0.8%
Imports Crude Oil	19.7	22.8	22.6	-0.7%	22.6	22.5	-0.3%	23.3	23.1	-0.7%
Imports Petroleum Products	4.7	6.2	5.6	-9.3%	5.6	5.3	-3.8%	8.1	7.5	-8.0%

**Pew Center  
Year 2010 Comparisons**

	Historical 2000	Technology Triumphs			Turbulent World			Awash in Oil and Gas		
		Base	Policy	% Change	Base	Policy	% Change	Base	Policy	% Change
<b>Natural Gas Supply (Quads)</b>										
Domestic Gas Production	19.6	23.3	23.8	2.3%	21.5	21.7	0.8%	24.6	25.0	1.7%
Imports of Gas	3.9	5.6	5.8	3.8%	5.6	5.7	1.1%	5.9	6.0	2.7%
TOTAL GAS DEMAND	23.4	28.9	29.6	2.6%	27.2	27.4	0.8%	30.5	31.0	1.9%
<b>Natural Gas Prices (2000\$)</b>										
Wellhead Gas Price (\$/Mcf)	\$2.76	\$2.64	\$2.81	6.4%	\$4.04	\$4.10	1.5%	\$2.68	\$2.80	4.5%
Industrial Gas Price (\$/MBtu)	\$3.65	\$3.23	\$5.42	67.8%	\$4.94	\$7.15	44.7%	\$3.27	\$6.40	95.7%
Commercial Gas Price (\$/MBtu)	\$7.39	\$5.13	\$7.47	45.6%	\$8.13	\$10.40	27.9%	\$5.20	\$8.43	62.1%
Residential Gas Price (\$/MBtu)	\$8.51	\$6.25	\$8.59	37.4%	\$9.25	\$11.50	24.3%	\$6.32	\$9.55	51.1%
<b>Electric Utility Gas Price (\$/MBtu)</b>										
Without Carbon Charge	\$3.19	\$3.05	\$3.24	6.2%	-98.1%	\$4.73	-582.3%	\$3.09	\$3.23	4.5%
With Carbon Charge	\$3.19	\$3.05	\$5.23	71.5%	-86.3%	\$6.87	-895.8%	\$3.09	\$6.20	100.6%
<b>Avg Electricity Price (2000\$/MWh)</b>										
Industrial Electricity Price	\$67.00	\$61.00	\$73.00	19.7%	\$63.00	\$74.00	17.5%	\$59.00	\$80.00	35.6%
Commercial Electricity Price	\$45.00	\$44.00	\$57.00	29.5%	\$46.00	\$58.00	26.1%	\$43.00	\$63.00	46.5%
Residential Electricity Price	\$73.00	\$61.00	\$73.00	19.7%	\$63.00	\$74.00	17.5%	\$59.00	\$80.00	35.6%
	\$81.00	\$76.00	\$88.00	15.8%	\$78.00	\$89.00	14.1%	\$74.00	\$95.00	28.4%
<b>III. TOTAL PRIMARY ENERGY SUPPLY BY FUEL AND SECTOR</b>										
<b>Petroleum Products (Quads)</b>										
Transport Petroleum	25.7	31.8	30.7	-3.3%	30.7	30.3	-1.2%	33.0	31.8	-3.5%
Other Petroleum	12.4	11.6	11.7	0.3%	12.1	11.9	-1.4%	13.1	13.3	1.7%
TOTAL PETROLEUM	38.1	43.4	42.4	-2.4%	42.7	42.2	-1.2%	46.1	45.2	-2.0%
<b>Natural Gas (Quads)</b>										
Central Station Natural Gas	4.2	5.5	6.8	23.5%	5.0	5.2	3.0%	7.2	9.0	25.3%
Sector Natural Gas	19.2	23.3	22.7	-2.4%	22.1	22.2	0.4%	23.2	22.0	-5.3%
Transport Natural Gas	0.0	0.1	0.1	0.0%	0.1	0.1	0.0%	0.1	0.1	0.0%
Natural Gas Reformed to Hydrogen	0.0	0.0	0.0	--	0.0	0.0	--	0.0	0.0	--
TOTAL NATURAL GAS	23.4	28.9	29.6	2.6%	27.2	27.4	0.8%	30.5	31.0	1.9%
<b>Coal (Quads)</b>										
Coal Generation	20.8	22.5	19.3	-14.2%	23.0	20.8	-9.5%	22.3	17.8	-19.9%
Other Sector Coal	2.6	2.4	2.4	0.0%	2.5	2.5	0.0%	2.5	2.5	0.0%
IGCC for Hydrogen	0.0	0.0	0.0	--	0.0	0.0	--	0.0	0.0	--
TOTAL COAL	23.4	25.0	21.8	-12.8%	25.5	23.3	-8.6%	24.7	20.3	-17.9%
<b>Renewable Energy (Quads)</b>										
Renewable Energy for Transport	0.2	0.2	0.5	145.5%	0.2	0.4	100.0%	0.2	0.3	60.0%
Electric Generation Renewables	3.8	3.9	4.0	1.8%	3.9	4.0	4.1%	3.6	4.3	19.0%
Wind Power to Produce Hydrogen	0.0	0.0	0.0	--	0.0	0.0	--	0.0	0.0	--
On Site Renewable Energy	2.9	3.2	3.2	0.0%	3.2	3.2	0.6%	3.2	3.2	1.9%
TOTAL RENEWABLE ENERGY	6.9	7.4	7.8	5.3%	7.3	7.7	5.6%	6.9	7.8	12.5%

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Year 2010 Comparisons**

	Historical 2000	Technology Triumphs			Turbulent World			Awash in Oil and Gas		
		Base	Policy	% Change	Base	Policy	% Change	Base	Policy	% Change
<b>Hydrogen Production (Quads)</b>										
Hydrogen from Natural Gas	0.0	0.0	0.0	--	0.0	0.0	--	0.0	0.0	--
Hydrogen from Renewables	0.0	0.0	0.0	--	0.0	0.0	--	0.0	0.0	--
Hydrogen from Coal Gasification	0.0	0.0	0.0	--	0.0	0.0	--	0.0	0.0	--
TOTAL HYDROGEN SUPPLY	0.0	0.0	0.0	--	0.0	0.0	--	0.0	0.0	--
<b>IV. ELECTRICITY SUPPLY</b>										
<b>Electricity Supply-Demand Balance (TWh)</b>										
Electricity End-Use Demand	3,569	4,298	4,209	-2.1%	4,239	4,140	-2.3%	4,405	4,236	-3.8%
Large CHP	369	464	460	-0.9%	410	449	9.5%	435	443	1.8%
Distributed Generation - excluding Wind Power	2	87	98	12.6%	34	83	144.1%	65	76	16.9%
Total Large CHP and Other DG	370	551	558	1.3%	444	531	19.6%	500	519	3.8%
Amount for Own Use	187	292	296	1.4%	235	282	20.0%	265	275	3.8%
Sales to Grid	183	259	262	1.2%	209	250	19.6%	235	244	3.8%
Electric Generators Load	3,458	4,013	3,910	-2.6%	4,062	3,864	-4.9%	4,181	3,980	-4.8%
Net Imports	35	35	35	0.0%	35	35	0.0%	35	35	0.0%
Total to Grid	3,676	4,307	4,208	-2.3%	4,305	4,149	-3.6%	4,451	4,259	-4.3%
Sales from Grid	3,382	4,006	3,913	-2.3%	4,004	3,858	-3.6%	4,140	3,961	-4.3%
T&D Losses	294	302	295	-2.3%	301	290	-3.7%	312	298	-4.5%
<b>CHP and Other Distributed Generation (TWh)</b>										
Conventional CHP	356	518	524	1.2%	423	504	19.1%	485	484	-0.2%
Municipal Solid Waste	14	14	14	0.0%	14	14	0.0%	14	14	0.0%
Fuel Cell CHP	0	13	13	0.0%	4	9	125.0%	0	13	--
Building Integrated PV	1	6	8	33.3%	3	5	66.7%	1	8	700.0%
<b>Electricity Generation, excluding CHP and Other DG (TWh)</b>										
Coal	1,907	2,181	1,913	-12.3%	2,226	2,050	-7.9%	2,156	1,771	-17.9%
Gas and Oil	533	697	844	21.1%	690	650	-5.8%	954	1,069	12.1%
Biomass Gasification	0	0	0	--	0	0	--	0	0	--
Nuclear	752	752	752	0.0%	771	771	0.0%	714	714	0.0%
Hydro	321	321	321	0.0%	321	321	0.0%	321	321	0.0%
Wind	9	46	64	39.1%	39	56	43.6%	23	88	282.6%
Geothermal	16	16	16	0.0%	15	16	6.7%	13	17	30.8%
TOTAL LOAD	3,458	4,013	3,910	-2.6%	4,062	3,864	-4.9%	4,181	3,980	-4.8%
<b>Fuel Use, excluding CHP and Other DG (Quads)</b>										
Coal	20.8	22.5	19.3	-14.2%	23.0	20.8	-9.5%	22.3	17.8	-19.9%
Petroleum	1.2	0.6	0.6	5.5%	1.0	0.9	-16.3%	0.6	0.8	37.9%
Natural Gas	4.2	5.5	6.8	23.5%	5.0	5.2	3.0%	7.2	9.0	25.3%
Biomass Co-firing and Other Fuels	0.1	0.1	0.1	0.0%	0.1	0.1	-7.7%	0.1	0.1	-8.3%
Net Imports Btu Equivalent	0.4	0.4	0.3	-2.9%	0.4	0.4	0.0%	0.3	0.3	0.0%
Fossil HeatRate (Btu/kWh)	10,729	9,930	9,685	-2.5%	9,968	9,947	-0.2%	9,657	9,721	0.7%

**Pew Center  
Year 2010 Comparisons**

	Historical 2000	Technology Triumphs			Turbulent World			Awash in Oil and Gas		
		Base	Policy	% Change	Base	Policy	% Change	Base	Policy	% Change
<b>Conventional Air Emissions</b>										
SO2 (thous tons)	12,767	7,282	7,024	-3.5%	6,376	6,455	1.2%	6,434	6,160	-4.3%
NOx (thous tons)	5,905	3,249	3,179	-2.2%	2,741	2,892	5.5%	2,838	2,699	-4.9%
Mercury (tons)	49	27	26	-4.3%	21	23	10.8%	24	22	-9.6%
<b>Investment Flows (millions of 2000\$)</b>										
Gas Facilities	\$4,124	\$3,453	\$2,306	-33.2%	\$2,820	\$2,355	-16.5%	\$10,801	\$5,678	-47.4%
Coal Facilities	\$0	\$4,336	\$2,521	-41.9%	\$9,023	\$3,118	-65.4%	\$2,038	\$84	-95.9%
Renewable Facilities	\$110	\$4,048	\$5,847	44.4%	\$3,545	\$5,643	59.2%	\$1,353	\$9,566	607.0%
Total (non-DG) Facilities	\$4,234	\$11,838	\$10,674	-9.8%	\$15,389	\$11,117	-27.8%	\$14,192	\$15,328	8.0%
TOTAL DISTRIBUTED GENERATION	\$0	\$4,182	\$4,492	7.4%	\$1,567	\$3,617	130.8%	\$2,559	\$3,719	45.3%
<b>Operations and Maintenance (millions of 2000\$)</b>										
Coal Facilities	\$17,760	\$19,606	\$17,741	-9.5%	\$19,987	\$18,625	-6.8%	\$19,425	\$17,118	-11.9%
Gas Facilities	\$1,141	\$2,148	\$2,135	-0.6%	\$2,153	\$1,907	-11.4%	\$3,037	\$2,542	-16.3%
Hydro Facilities	\$3,120	\$3,120	\$3,120	0.0%	\$3,120	\$3,120	0.0%	\$3,120	\$3,120	0.0%
Renewable Facilities	\$379	\$704	\$862	22.4%	\$675	\$860	27.4%	\$478	\$1,205	152.1%
TOTAL O&M COSTS	\$22,400	\$25,578	\$23,857	-6.7%	\$25,934	\$24,512	-5.5%	\$26,060	\$23,985	-8.0%
<b>IV. TRANSPORTATION ENERGY USE</b>										
<b>Vehicle Miles Travelled (LDVs including Light Commercial Trucks)</b>										
VMT (billions)	2,396	3,269	3,262	-0.2%	3,259	3,257	-0.1%	3,311	3,265	-1.4%
<b>New Vehicle On-Road Average Fuel Economy Calculations</b>										
New Car Avg Fuel Economy	22.8	34.8	34.8	0.0%	34.9	34.8	-0.3%	25.2	26.5	5.2%
New Light Truck Avg Fuel Economy	17.0	26.1	26.1	0.0%	26.2	26.1	-0.4%	19.1	19.9	4.2%
Overall LDV On-Road Fuel Economy	19.8	30.1	30.1	0.0%	30.3	30.1	-0.7%	21.9	23.0	5.0%
<b>New Light-Duty Vehicle Sales by Technology (1000s)</b>										
Conventional Vehicle	17,256	14,181	13,966	-1.5%	13,751	13,880	0.9%	18,419	17,319	-6.0%
Dedicated CNG Vehicle	48	73	72	-1.4%	72	72	0.0%	78	73	-6.4%
Advanced Diesel & Other Advanced ICES	0	2,492	2,477	-0.6%	2,670	2,452	-8.2%	0	0	--
Hybrid Electric Vehicle	52	1,334	1,317	-1.3%	1,318	1,301	-1.3%	748	527	-29.5%
FCV with On-Board Reformer	0	0	0	--	0	0	--	0	0	--
Hydrogen FCV	0	0	0	--	0	0	--	0	0	--
Electric Vehicles	0	0	0	--	0	0	--	0	0	--
TOTAL LDV SALES	17,355	18,080	17,833	-1.4%	17,811	17,705	-0.6%	19,245	17,918	-6.9%

**Pew Center  
Year 2010 Comparisons**

	Historical 2000	Technology Triumphs			Turbulent World			Awash in Oil and Gas		
		Base	Policy	% Change	Base	Policy	% Change	Base	Policy	% Change
<b>Transportation Energy Consumption by Fuel Type (excluding pipeline natural gas use) - Quads</b>										
Motor Gasoline	15.8	18.7	18.9	0.7%	18.6	18.9	1.3%	20.0	20.0	0.0%
Diesel Fuel	5.2	7.3	6.5	-11.0%	6.8	6.3	-6.8%	7.3	6.5	-10.9%
Jet Fuel	3.6	4.5	4.2	-8.0%	4.1	3.9	-3.9%	4.5	4.2	-8.0%
Residual and Other Petroleum	1.1	1.2	1.2	0.0%	1.2	1.2	4.3%	1.2	1.2	0.0%
Petroleum Subtotal	25.7	31.8	30.7	-3.3%	30.7	30.3	-1.2%	33.0	31.8	-3.5%
Natural Gas Fuel	0.0	0.1	0.1	0.0%	0.1	0.1	0.0%	0.1	0.1	0.0%
Biofuels to Replace Gasoline	0.1	0.2	0.4	140.0%	0.2	0.3	93.3%	0.1	0.2	57.1%
Bio-Diesel	0.0	0.0	0.0	--	0.0	0.0	--	0.0	0.0	--
Hydrogen	0.0	0.0	0.0	--	0.0	0.0	--	0.0	0.0	--
Electricity	0.1	0.1	0.1	0.0%	0.1	0.1	0.0%	0.1	0.1	0.0%
TOTAL DELIVERED ENERGY	25.9	32.0	31.2	-2.6%	31.0	30.8	-0.6%	33.3	32.2	-3.2%
<b>New Light-Duty Vehicle Shares by Technology (pct)</b>										
Conventional Vehicle	99%	78%	78%	-0.1%	77%	78%	1.6%	96%	97%	1.0%
Dedicated CNG Vehicle	0%	0%	0%	0.0%	0%	0%	0.0%	0%	0%	0.0%
Advanced Diesel & Other Advanced ICES	0%	14%	14%	0.7%	15%	14%	-8.0%	0%	0%	--
Hybrid Electric Vehicle	0%	7%	7%	0.0%	7%	7%	-1.4%	4%	3%	-25.6%
FCV with On-Board Reformer	0%	0%	0%	--	0%	0%	--	0%	0%	--
Hydrogen FCV	0%	0%	0%	--	0%	0%	--	0%	0%	--
Electric Vehicles	0%	0%	0%	--	0%	0%	--	0%	0%	--
TOTAL PERCENTAGE	100%	100%	100%	0.0%	100%	100%	-0.1%	100%	100%	0.0%
<b>New Light-Duty Vehicle Shares by Detailed Size Class(pct)</b>										
Sub-compact Car	15%	13%	13%	3.1%	13%	13%	0.0%	13%	13%	3.9%
Compact Car	18%	16%	15%	-2.6%	15%	15%	0.0%	16%	15%	-3.2%
Medium Car	20%	21%	21%	0.5%	21%	21%	0.0%	21%	21%	0.5%
X-Large Car	4%	4%	4%	-2.4%	4%	4%	0.0%	4%	4%	-2.4%
Mini-vans	11%	12%	12%	0.0%	12%	12%	0.0%	12%	12%	0.0%
Regulr SUV	10%	12%	12%	1.7%	12%	12%	0.0%	11%	12%	4.5%
Large SUV	1%	4%	4%	-4.8%	4%	4%	0.0%	5%	4%	-13.0%
Pick-up or Van	21%	19%	19%	0.0%	19%	19%	0.0%	19%	19%	0.0%
TOTAL PERCENTAGE	100%	100%	100%	0.0%	100%	100%	0.0%	100%	100%	-0.1%
<b>New Light-Duty Vehicles by Major Size Class (1000)</b>										
Small Car	5,669	5,136	5,066	-1.4%	5,060	5,030	-0.6%	5,468	5,091	-6.9%
Large Car	4,177	4,533	4,471	-1.4%	4,466	4,439	-0.6%	4,826	4,493	-6.9%
Mini-van	1,948	2,084	2,056	-1.3%	2,053	2,041	-0.6%	2,218	2,065	-6.9%
SUV	1,905	2,843	2,804	-1.4%	2,801	2,784	-0.6%	3,026	2,818	-6.9%
Cargo Vehicle	3,657	3,483	3,435	-1.4%	3,431	3,411	-0.6%	3,707	3,452	-6.9%
TOTAL LDV SALES	17,355	18,080	17,833	-1.4%	17,811	17,705	-0.6%	19,245	17,918	-6.9%
<b>Fuel Consumption by Transportation Mode (excludes Specialized Petroleum Products such as Lubricants) - Quads</b>										
Total LDV Fuel Use	15.0	17.9	17.8	-0.3%	17.8	17.8	-0.1%	19.1	18.8	-1.6%
Commercial Truck Fuel	0.7	0.9	0.8	-2.4%	0.8	0.8	0.0%	0.9	0.8	-2.4%
Freight Truck Fuel	4.3	6.2	5.8	-6.0%	5.7	5.6	-1.4%	6.2	5.8	-6.0%
Jet Fuel	3.6	4.5	4.2	-8.0%	4.1	3.9	-3.9%	4.5	4.2	-8.0%
Train Fuel	0.6	0.7	0.7	-1.4%	0.7	0.7	1.5%	0.7	0.7	-1.4%
Marine Fuel	1.5	1.6	1.6	0.0%	1.6	1.6	2.6%	1.6	1.6	0.0%
TOTAL FUEL USE	25.6	31.7	30.9	-2.6%	30.7	30.5	-0.7%	33.0	31.9	-3.3%

**Pew Center  
Year 2020 Comparisons**

	Historical 2000	Technology Triumphs			Turbulent World			Awash in Oil and Gas		
		Base	Policy	% Change	Base	Policy	% Change	Base	Policy	% Change
<b>I. OVERVIEW DATA</b>										
<b>Macroeconomic Variables (billions of 2000\$)</b>										
Real Consumption	\$6,699	\$12,728	\$12,604	-1.0%	\$10,152	\$9,940	-2.1%	\$12,700	\$12,316	-3.0%
Real Investment	\$1,898	\$4,878	\$5,005	2.6%	\$4,161	\$4,296	3.2%	\$4,880	\$5,040	3.3%
Real Government Purchases	\$1,684	\$2,439	\$2,454	0.6%	\$2,439	\$2,459	0.8%	\$2,439	\$2,471	1.3%
Real Exports	\$1,213	\$5,014	\$5,008	-0.1%	\$4,705	\$4,686	-0.4%	\$4,977	\$4,945	-0.6%
Real Imports	\$1,620	\$5,311	\$5,352	0.8%	\$5,372	\$5,400	0.5%	\$5,252	\$5,286	0.6%
TOTAL REAL GDP	\$9,873	\$19,748	\$19,719	-0.1%	\$16,086	\$15,980	-0.7%	\$19,744	\$19,485	-1.3%
<b>Program Spending (billions of 2000\$)</b>										
Deployment Programs	\$0.00	--	\$6.40	--	--	\$9.80	--	--	\$16.10	--
Technology R&D	\$0.00	--	\$6.00	--	--	\$6.30	--	--	\$9.00	--
<b>Macroeconomic Investment Components</b>										
<b>Aggregate Investment Totals (billions of 2000\$)</b>										
Electric Utility	\$4	\$16	\$23	41.0%	\$26	\$24	-9.6%	\$16	\$23	43.9%
Infrastructure	\$0	\$36	\$41	11.9%	\$32	\$25	-23.1%	\$29	-\$63	-317.2%
Efficient Equipment	\$213	\$344	\$405	18.0%	\$346	\$410	18.6%	\$331	\$419	26.4%
Vehicle Purchases	\$384	\$724	\$579	-20.1%	\$501	\$579	15.6%	\$549	\$613	11.8%
TOTAL ENERGY-RELATED INVESTMENT	\$601	\$1,120	\$1,047	-6.5%	\$905	\$1,037	14.6%	\$925	\$992	7.3%
<b>Detailed Investment Totals (billions of 2000\$)</b>										
Electric Facilities - Fossil	\$4	\$8	\$11	41.9%	\$19	\$13	-34.9%	\$13	\$4	-70.1%
Renewable Electricity	\$0	\$8	\$12	41.3%	\$7	\$11	56.3%	\$3	\$19	588.6%
Distributed Generation	\$0	\$10	\$11	5.9%	\$4	\$8	97.2%	\$4	\$8	90.4%
Hydrogen Infrastructure	\$0	\$3	\$31	854.4%	\$7	\$41	508.4%	\$0	\$12	--
Fuel Supply	\$0	\$23	\$20	-13.1%	\$21	\$19	-12.7%	\$25	\$21	-16.7%
Sequestration Investment	\$0	\$0	\$2	--	\$0	\$3	--	\$0	\$2	--
Residential Efficient Equip.	\$77	\$125	\$138	10.0%	\$125	\$139	11.1%	\$121	\$140	15.7%
Commercial Efficient Equip.	\$72	\$116	\$136	17.4%	\$116	\$137	18.2%	\$111	\$140	25.1%
Industrial Efficient Equip.	\$64	\$103	\$132	28.4%	\$104	\$134	27.9%	\$99	\$139	41.0%
Freight & Air Efficiency	\$0	\$0	\$36	--	\$0	\$37	--	\$0	\$49	--
Business Light-Duty Vehicles	\$173	\$225	\$244	8.6%	\$225	\$244	8.1%	\$247	\$254	2.9%
Non-Energy Production	\$0	\$0	-\$24	--	\$0	-\$46	--	\$0	-\$105	--
<b>Expenditures on Imported Oil and Gas (billions of 2000\$)</b>										
Crude Oil Imports	\$92	\$84	\$71	-16.1%	\$171	\$146	-14.9%	\$96	\$80	-16.4%
Petroleum Product Imports	\$31	\$25	\$12	-53.4%	\$29	\$25	-13.1%	\$66	\$22	-66.8%
Natural Gas Imports	\$10	\$18	\$19	4.3%	\$21	\$21	1.3%	\$21	\$16	-25.8%
<b>Light-Duty Vehicle Purchases (billions of 2000\$)</b>										
Household Vehicles	\$211	\$275	\$299	8.6%	\$275	\$298	8.1%	\$302	\$310	2.9%
Business Light-Duty Vehicles	\$173	\$225	\$244	8.6%	\$225	\$244	8.1%	\$247	\$254	2.9%
TOTAL LIGHT-DUTY VEHICLES (LDVs)	\$384	\$500	\$543	8.6%	\$501	\$541	8.1%	\$549	\$564	2.9%
Avg Price per Vehicle	\$22,097	\$26,819	\$29,921	11.6%	\$27,833	\$31,351	12.6%	\$25,050	\$30,568	22.0%



**Pew Center  
Year 2020 Comparisons**

	Historical 2000	Technology Triumphs			Turbulent World			Awash in Oil and Gas		
		Base	Policy	% Change	Base	Policy	% Change	Base	Policy	% Change
<b>Energy Expenditures by Major Sector (billions of 2000\$)</b>										
Residential	\$144	\$164	\$202	23.0%	\$178	\$203	13.5%	\$167	\$220	31.2%
Commercial	\$118	\$132	\$158	20.0%	\$145	\$158	8.6%	\$136	\$173	27.4%
Industrial	\$183	\$189	\$246	30.5%	\$234	\$250	6.6%	\$218	\$293	34.3%
Transportation	\$264	\$304	\$329	8.0%	\$478	\$430	-9.9%	\$381	\$428	12.2%
TOTAL ECONOMY-WIDE EXPENDITURES	\$709	\$789	\$935	18.5%	\$1,035	\$1,040	0.5%	\$902	\$1,113	23.4%
Average Primary Energy Price (\$/Mbtu)	\$7.07	\$6.68	\$9.46	41.7%	\$9.14	\$10.70	17.1%	\$7.00	\$10.70	52.8%
<b>Energy Consumption (Quads)</b>										
Petroleum Products	38.1	41.2	35.4	-14.2%	38.2	34.4	-10.1%	51.8	39.8	-23.1%
Natural Gas	23.4	34.6	34.9	1.0%	29.2	29.3	0.4%	40.0	37.3	-6.7%
Coal	23.4	25.2	11.3	-55.1%	29.0	15.9	-45.2%	23.7	9.4	-60.3%
Renewable Energy	6.9	9.7	10.6	9.7%	9.0	10.4	16.2%	7.1	11.2	57.3%
Nuclear Power	8.1	7.1	6.3	-11.9%	7.6	7.3	-4.1%	5.9	5.9	-0.2%
Other	0.4	0.4	0.4	0.0%	0.4	0.4	0.0%	0.4	0.4	0.0%
TOTAL PRIMARY ENERGY	100.3	118.2	98.9	-16.3%	113.3	97.6	-13.8%	128.8	103.9	-19.3%
TPE / GDP (kBtu / 2000\$)	10.2	5.98	5.01	-16.2%	7.04	6.11	-13.2%	6.52	5.33	-18.3%
<b>Carbon Emissions (MTC)</b>										
Transportation Carbon	511	620	512	-17.4%	574	494	-13.9%	758	569	-24.9%
End Use Carbon	458	576	495	-14.1%	512	462	-9.8%	622	512	-17.7%
Central Station Carbon	589	664	381	-42.6%	727	447	-38.5%	718	381	-46.9%
Captured & Sequestered	0	0	-38	--	0	-38	--	0	-23	--
ECONOMY-WIDE CARBON EMISSIONS	1,559	1,860	1,349	-27.5%	1,813	1,365	-24.7%	2,098	1,439	-31.4%
Carbon-to-GDP Ratio (grams / 2000\$)										
Emissions per \$ Output	158	94	68	-27.7%	112	85	-24.1%	106	74	-30.2%
<b>II. ENERGY PRICE AND SUPPLY</b>										
<b>Carbon Charge (2000\$)</b>										
Carbon Price (\$/metric ton)	\$0	\$0	\$197	--	\$0	\$211	--	\$0	\$295	--
Carbon Price in Gas (\$/MBtu)	\$0	\$0	\$3	--	\$0	\$3	--	\$0	\$4	--
Carbon Price in Coal (\$/MBtu)	\$0	\$0	\$5	--	\$0	\$5	--	\$0	\$7	--
<b>Oil Prices (2000\$)</b>										
World Oil Price (2000\$/bbl)	\$27.70	\$22.50	\$21.40	-4.9%	\$46.60	\$45.90	-1.5%	\$23.50	\$21.40	-8.9%
Crude Oil Price (2000\$/MBtu)	\$4.66	\$3.78	\$3.59	-5.0%	\$7.84	\$7.72	-1.5%	\$3.95	\$3.60	-8.9%
<b>Petroleum Supply (Quads)</b>										
Domestic Crude Oil	15.0	14.2	13.5	-4.9%	13.8	13.4	-3.0%	15.5	14.2	-8.7%
Imports Crude Oil	19.7	22.4	19.7	-11.8%	21.8	18.8	-13.7%	24.2	22.3	-8.1%
Imports Petroleum Products	4.7	4.7	2.3	-51.2%	2.6	2.3	-11.9%	11.9	4.3	-63.5%

**Pew Center  
Year 2020 Comparisons**

	Historical 2000	Technology Triumphs			Turbulent World			Awash in Oil and Gas		
		Base	Policy	% Change	Base	Policy	% Change	Base	Policy	% Change
<b>Natural Gas Supply (Quads)</b>										
Domestic Gas Production	19.6	27.72	27.95	0.8%	22.94	23.02	0.3%	32.03	30.25	-5.6%
Imports of Gas	3.9	6.85	6.97	1.8%	6.21	6.25	0.6%	7.95	7.07	-11.1%
TOTAL GAS DEMAND	23.4	34.57	34.92	1.0%	29.15	29.27	0.4%	39.98	37.32	-6.7%
<b>Natural Gas Prices (2000\$)</b>										
Wellhead Gas Price (\$/Mcf)	\$2.76	\$2.65	\$2.71	2.3%	\$3.46	\$3.49	0.9%	\$2.69	\$2.25	-16.4%
Industrial Gas Price (\$/MBtu)	\$3.65	\$3.13	\$6.09	94.6%	\$4.10	\$7.22	76.1%	\$3.18	\$6.96	118.9%
Commercial Gas Price (\$/MBtu)	\$7.39	\$4.36	\$7.36	68.8%	\$5.87	\$9.01	53.5%	\$4.43	\$7.91	78.6%
Residential Gas Price (\$/MBtu)	\$8.51	\$5.48	\$8.48	54.7%	\$6.99	\$10.10	44.5%	\$5.55	\$9.03	62.7%
<b>Electric Utility Gas Price (\$/MBtu)</b>										
Without Carbon Charge	\$3.19	\$3.05	\$3.13	2.6%	\$3.99	\$4.03	1.0%	\$3.10	\$2.59	-16.5%
With Carbon Charge	\$3.19	\$3.05	\$6.01	97.0%	\$3.99	\$7.12	78.4%	\$3.10	\$6.89	122.3%
<b>Avg Electricity Price (2000\$/MWh)</b>										
Industrial Electricity Price	\$67.00	\$63.00	\$84.00	33.3%	\$69.00	\$84.00	21.7%	\$59.00	\$92.00	55.9%
Commercial Electricity Price	\$45.00	\$46.00	\$67.00	45.7%	\$51.00	\$67.00	31.4%	\$42.00	\$75.00	78.6%
Residential Electricity Price	\$73.00	\$64.00	\$85.00	32.8%	\$69.00	\$85.00	23.2%	\$60.00	\$93.00	55.0%
Residential Electricity Price	\$81.00	\$78.00	\$99.00	26.9%	\$83.00	\$99.00	19.3%	\$74.00	\$107.00	44.6%
<b>III. TOTAL PRIMARY ENERGY SUPPLY BY FUEL AND SECTOR</b>										
<b>Petroleum Products (Quads)</b>										
Transport Petroleum	25.7	31.1	25.7	-17.4%	28.8	24.8	-13.9%	38.0	28.6	-24.8%
Other Petroleum	12.4	10.2	9.7	-4.5%	9.5	9.6	1.5%	13.8	11.3	-18.6%
TOTAL PETROLEUM	38.1	41.2	35.4	-14.2%	38.2	34.4	-10.1%	51.8	39.8	-23.1%
<b>Natural Gas (Quads)</b>										
Central Station Natural Gas	4.2	4.8	9.4	96.0%	3.0	6.0	99.0%	11.1	12.1	8.6%
Sector Natural Gas	19.2	29.7	25.1	-15.5%	26.1	23.1	-11.2%	28.8	25.0	-13.1%
Transport Natural Gas	0.0	0.1	0.1	0.0%	0.1	0.1	-11.1%	0.1	0.1	-27.3%
Natural Gas Reformed to Hydrogen	0.0	0.0	0.4	3500.0%	0.0	0.1	--	0.0	0.2	--
TOTAL NATURAL GAS	23.4	34.6	34.9	1.0%	29.2	29.3	0.4%	40.0	37.3	-6.7%
<b>Coal (Quads)</b>										
Coal Generation	20.8	23.0	9.2	-60.0%	26.6	13.2	-50.4%	21.4	7.7	-64.2%
Other Sector Coal	2.6	2.3	1.8	-19.8%	2.3	1.9	-18.6%	2.3	1.8	-24.2%
IGCC for Hydrogen	0.0	0.0	0.0	--	0.0	0.0	--	0.0	0.0	--
TOTAL COAL	23.4	25.2	11.3	-55.1%	29.0	15.9	-45.2%	23.7	9.4	-60.3%
<b>Renewable Energy (Quads)</b>										
Renewable Energy for Transport	0.2	0.7	1.3	90.0%	0.7	1.4	106.1%	0.2	0.7	270.0%
Electric Generation Renewables	3.8	5.1	5.1	1.6%	4.7	5.3	11.8%	3.5	6.4	82.8%
Wind Power to Produce Hydrogen	0.0	0.0	0.3	3000.0%	0.0	0.1	--	0.0	0.2	--
On Site Renewable Energy	2.9	3.9	3.8	-1.8%	3.6	3.7	3.9%	3.4	3.9	14.1%
TOTAL RENEWABLE ENERGY	6.9	9.7	10.6	9.7%	9.0	10.4	16.2%	7.1	11.2	57.3%

**Pew Center  
Year 2020 Comparisons**

	Historical 2000	Technology Triumphs			Turbulent World			Awash in Oil and Gas		
		Base	Policy	% Change	Base	Policy	% Change	Base	Policy	% Change
<b>Hydrogen Production (Quads)</b>										
Hydrogen from Natural Gas	0.0	0.0	0.0	--	0.0	0.0	--	0.0	0.1	--
Hydrogen from Renewables	0.0	0.0	0.0	--	0.0	0.0	--	0.0	0.1	--
Hydrogen from Coal Gasification	0.0	0.0	0.0	--	0.0	0.0	--	0.0	0.0	--
TOTAL HYDROGEN SUPPLY	0.0	0.0	0.5	--	0.0	0.4	--	0.0	0.2	--
<b>IV. ELECTRICITY SUPPLY</b>										
<b>Electricity Supply-Demand Balance (TWh)</b>										
Electricity End-Use Demand	3,569	4,874	4,307	-11.6%	4,682	4,055	-13.4%	5,201	4,227	-18.7%
Large CHP	369	598	587	-1.8%	425	533	25.4%	495	496	0.2%
Distributed Generation - excluding Wind Power	2	305	331	8.5%	129	277	114.7%	160	243	51.9%
Total Large CHP and Other DG	370	903	919	1.8%	554	810	46.2%	655	739	12.8%
Amount for Own Use	187	482	491	1.9%	296	432	45.9%	350	395	12.9%
Sales to Grid	183	421	428	1.7%	258	377	46.1%	305	344	12.8%
Electric Generators Load	3,458	4,217	3,597	-14.7%	4,373	3,442	-21.3%	4,821	3,698	-23.3%
Net Imports	35	35	35	0.0%	35	35	0.0%	35	35	0.0%
Total to Grid	3,676	4,672	4,060	-13.1%	4,666	3,854	-17.4%	5,161	4,077	-21.0%
Sales from Grid	3,382	4,392	3,816	-13.1%	4,386	3,623	-17.4%	4,851	3,832	-21.0%
T&D Losses	294	280	244	-12.9%	280	231	-17.5%	310	245	-21.0%
<b>CHP and Other Distributed Generation (TWh)</b>										
Conventional CHP	356	714	714	0.0%	465	643	38.3%	614	585	-4.7%
Municipal Solid Waste	14	12	12	0.0%	12	12	0.0%	12	12	0.0%
Fuel Cell CHP	0	126	132	4.8%	60	118	96.7%	21	79	276.2%
Building Integrated PV	1	50	62	24.0%	17	37	117.6%	8	63	687.5%
<b>Electricity Generation, excluding CHP and Other DG (TWh)</b>										
Coal	1,907	2,310	947	-59.0%	2,741	1,359	-50.4%	2,141	820	-61.7%
Gas and Oil	533	629	1,290	105.1%	359	725	101.9%	1,611	1,475	-8.4%
Biomass Gasification	0	1	1	0.0%	0	1	--	0	1	--
Nuclear	752	752	752	0.0%	790	790	0.0%	677	677	0.0%
Hydro	321	321	321	0.0%	321	321	0.0%	321	321	0.0%
Wind	9	166	245	47.6%	131	208	58.8%	56	358	539.3%
Geothermal	16	37	40	8.1%	29	38	31.0%	14	45	221.4%
TOTAL LOAD	3,458	4,217	3,597	-14.7%	4,373	3,442	-21.3%	4,821	3,698	-23.3%
<b>Fuel Use, excluding CHP and Other DG (Quads)</b>										
Coal	20.8	23.0	9.5	-58.6%	26.7	14.0	-47.4%	21.4	7.7	-64.2%
Petroleum	1.2	0.0	0.1	25.0%	0.1	0.1	-44.4%	0.0	0.2	325.0%
Natural Gas	4.2	4.8	9.4	96.0%	3.0	6.0	99.0%	11.1	12.1	8.6%
Biomass Co-firing and Other Fuels	0.1	0.1	0.1	-12.5%	0.1	0.1	-27.3%	0.1	0.1	-12.5%
Net Imports Btu Equivalent	0.4	0.3	0.3	-12.1%	0.3	0.3	-5.9%	0.3	0.3	0.0%
Fossil Heat Rate (Btu/KWh)	10,729	9,464	8,341	-11.9%	9,575	9,176	-4.2%	8,680	8,676	0.0%

**Pew Center  
Year 2020 Comparisons**

	Historical 2000	Technology Triumphs			Turbulent World			Awash in Oil and Gas		
		Base	Policy	% Change	Base	Policy	% Change	Base	Policy	% Change
<b>Conventional Air Emissions</b>										
SO <sub>2</sub> (thous tons)	12,767	5,576	1,992	-64.3%	3,673	1,629	-55.6%	3,516	1,299	-63.1%
NO <sub>x</sub> (thous tons)	5,905	2,750	1,285	-53.3%	2,222	1,376	-38.1%	2,222	1,185	-46.7%
Mercury (tons)	49	19	7	-63.0%	13	8	-39.9%	15	6	-61.8%
<b>Investment Flows (millions of 2000\$)</b>										
Gas Facilities	\$4,124	\$3,847	\$4,728	22.9%	\$2,622	\$768	-70.7%	\$11,200	\$3,280	-70.7%
Coal Facilities	\$0	\$3,765	\$6,037	60.3%	\$16,585	\$11,765	-29.1%	\$1,847	\$643	-65.2%
Renewable Facilities	\$110	\$8,355	\$11,756	40.7%	\$7,231	\$11,345	56.9%	\$2,728	\$18,776	588.3%
Total (non-DG) Facilities	\$4,234	\$15,967	\$22,520	41.0%	\$26,437	\$23,878	-9.7%	\$15,775	\$22,700	43.9%
TOTAL DISTRIBUTED GENERATION	\$0	\$10,200	\$10,830	6.2%	\$4,260	\$8,440	98.1%	\$3,943	\$7,457	89.1%
<b>Operations and Maintenance (millions of 2000\$)</b>										
Coal Facilities	\$17,760	\$19,126	\$8,790	-54.0%	\$22,244	\$12,194	-45.2%	\$17,931	\$8,628	-51.9%
Gas Facilities	\$1,141	\$2,535	\$3,842	51.6%	\$2,134	\$2,394	12.2%	\$5,794	\$4,220	-27.2%
Hydro Facilities	\$3,120	\$3,120	\$3,120	0.0%	\$3,120	\$3,120	0.0%	\$3,120	\$3,120	0.0%
Renewable Facilities	\$379	\$2,164	\$2,923	35.1%	\$1,889	\$2,830	49.8%	\$841	\$4,497	434.7%
TOTAL O&M COSTS	\$22,400	\$26,945	\$18,675	-30.7%	\$29,388	\$20,538	-30.1%	\$27,686	\$20,466	-26.1%
<b>IV. TRANSPORTATION ENERGY USE</b>										
<b>Vehicle Miles Travelled (LDVs including Light Commercial Trucks)</b>										
VMT (billions)	2,396	3,557	3,501	-1.6%	3,498	3,438	-1.7%	3,840	3,528	-8.1%
<b>New Vehicle On-Road Average Fuel Economy Calculations</b>										
New Car Avg Fuel Economy	22.8	40.9	63.4	55.0%	43.5	61.8	42.1%	25.5	54.5	113.7%
New Light Truck Avg Fuel Economy	17.0	30.5	42.7	40.0%	32.4	42.4	30.9%	19.2	39.3	104.7%
Overall LDV On-Road Fuel Economy	19.8	35.1	51.6	47.0%	37.5	50.8	35.5%	22.0	46.1	109.5%
<b>New Light-Duty Vehicle Sales by Technology (1000s)</b>										
Conventional Vehicle	17,256	8,824	0	-100.0%	6,795	0	-100.0%	20,700	0	-100.0%
Dedicated CNG Vehicle	48	112	109	-2.7%	143	138	-3.5%	131	111	-15.3%
Advanced Diesel & Other Advanced ICES	0	3,939	4,114	4.4%	4,152	4,127	-0.6%	0	4,847	--
Hybrid Electric Vehicle	52	4,522	4,310	-4.7%	5,077	4,952	-2.5%	1,067	9,279	769.6%
FCV with On-Board Reformer	0	936	3,458	269.4%	1,216	2,992	146.1%	0	2,815	--
Hydrogen FCV	0	297	6,147	1969.7%	608	5,059	732.1%	0	1,411	--
Electric Vehicles	0									
TOTAL LDV SALES	17,355	18,630	18,138	-2.6%	17,990	17,267	-4.0%	21,898	18,463	-15.7%

**Pew Center  
Year 2020 Comparisons**

	Historical	Technology Triumphs			Turbulent World			Awash in Oil and Gas		
	2000	Base	Policy	% Change	Base	Policy	% Change	Base	Policy	% Change
<b>Transportation Energy Consumption by Fuel Type (excluding pipeline natural gas use) - Quads</b>										
Motor Gasoline	15.8	15.2	12.5	-17.2%	14.3	12.4	-13.6%	22.6	15.6	-30.8%
Diesel Fuel	5.2	9.4	7.4	-21.4%	8.7	7.1	-18.3%	8.7	7.1	-18.4%
Jet Fuel	3.6	5.2	4.5	-14.7%	4.5	4.0	-10.8%	5.4	4.6	-15.6%
Residual and Other Petroleum	1.1	1.3	1.3	1.6%	1.2	1.2	0.0%	1.3	1.3	1.6%
Petroleum Subtotal	25.7	31.1	25.7	-17.4%	28.8	24.8	-13.9%	38.0	28.6	-24.8%
Natural Gas Fuel	0.0	0.1	0.1	0.0%	0.1	0.1	-11.1%	0.1	0.1	-27.3%
Biofuels to Replace Gasoline	0.1	0.4	0.8	79.5%	0.4	0.8	97.6%	0.1	0.5	235.7%
Bio-Diesel	0.0	0.1	0.1	180.0%	0.1	0.1	180.0%	0.0	0.1	--
Hydrogen	0.0	0.0	0.5	2500.0%	0.0	0.4	1333.3%	0.0	0.2	--
Electricity	0.1	0.1	0.1	0.0%	0.1	0.1	0.0%	0.1	0.1	0.0%
TOTAL DELIVERED ENERGY	25.9	31.7	27.3	-14.1%	29.4	26.3	-10.6%	38.3	29.4	-23.1%
<b>New Light-Duty Vehicle Shares by Technology (pct)</b>										
Conventional Vehicle	99%	47%	0%	-100.0%	38%	0%	-100.0%	95%	0%	-100.0%
Dedicated CNG Vehicle	0%	1%	1%	0.0%	1%	1%	0.0%	1%	1%	0.0%
Advanced Diesel & Other Advanced ICEs	0%	21%	23%	7.6%	23%	24%	3.5%	0%	26%	--
Hybrid Electric Vehicle	0%	24%	24%	-2.1%	28%	29%	1.8%	5%	50%	926.5%
FCV with On-Board Reformer	0%	5%	19%	282.0%	7%	17%	154.4%	0%	15%	--
Hydrogen FCV	0%	2%	34%	2018.8%	3%	29%	761.8%	0%	8%	--
Electric Vehicles	0%	0%	0%	--	0%	0%	--	0%	0%	--
TOTAL PERCENTAGE	100%	100%	100%	0.1%	100%	100%	-0.1%	100%	100%	0.0%
<b>New Light-Duty Vehicle Shares by Detailed Size Class(pct)</b>										
Sub-compact Car	15%	12%	19%	59.5%	15%	19%	20.9%	11%	19%	62.3%
Compact Car	18%	14%	13%	-7.6%	17%	13%	-19.4%	15%	13%	-9.5%
Medium Car	20%	21%	19%	-10.0%	18%	19%	6.2%	21%	19%	-10.0%
X-Large Car	4%	4%	2%	-45.2%	3%	2%	-32.4%	4%	2%	-46.5%
Mini-vans	11%	12%	12%	0.0%	12%	12%	0.0%	12%	12%	0.0%
Regulr SUV	10%	13%	15%	13.3%	12%	15%	17.9%	12%	15%	19.8%
Large SUV	1%	5%	2%	-66.7%	4%	2%	-57.5%	6%	2%	-70.2%
Pick-up or Van	21%	19%	19%	-0.5%	19%	19%	0.0%	19%	19%	-0.5%
TOTAL PERCENTAGE	100%	100%	100%	0.0%	100%	100%	-0.1%	100%	100%	-0.1%
<b>New Light-Duty Vehicles by Major Size Class (1000)</b>										
Small Car	5,669	4,860	5,777	18.9%	5,730	5,500	-4.0%	5,712	5,881	3.0%
Large Car	4,177	4,682	3,824	-18.3%	3,793	3,641	-4.0%	5,503	3,893	-29.3%
Mini-van	1,948	2,147	2,091	-2.6%	2,074	1,990	-4.1%	2,524	2,128	-15.7%
SUV	1,905	3,327	2,945	-11.5%	2,921	2,803	-4.0%	3,910	2,997	-23.4%
Cargo Vehicle	3,657	3,614	3,501	-3.1%	3,473	3,333	-4.0%	4,248	3,564	-16.1%
TOTAL LDV SALES	17,355	18,630	18,138	-2.6%	17,990	17,267	-4.0%	21,898	18,463	-15.7%
<b>Fuel Consumption by Transportation Mode (excludes Specialized Petroleum Products such as Lubricants) - Quads</b>										
Total LDV Fuel Use	15.0	15.4	13.6	-11.6%	14.8	13.5	-8.9%	21.6	15.6	-27.7%
Commercial Truck Fuel	0.7	0.9	0.7	-20.7%	0.8	0.7	-17.9%	0.9	0.7	-24.5%
Freight Truck Fuel	4.3	7.3	5.6	-22.9%	6.6	5.4	-18.6%	7.4	5.7	-23.7%
Jet Fuel	3.6	5.2	4.5	-14.7%	4.5	4.0	-10.8%	5.4	4.6	-15.6%
Train Fuel	0.6	0.8	0.8	-3.7%	0.8	0.8	0.0%	0.8	0.8	-3.6%
Marine Fuel	1.5	1.8	1.8	0.0%	1.6	1.7	4.3%	1.8	1.8	-0.6%
TOTAL FUEL USE	25.6	31.4	27.0	-14.2%	29.1	26.0	-10.7%	38.0	29.1	-23.3%

**Pew Center  
Year 2035 Comparisons**

	Historical 2000	Technology Triumphs			Turbulent World			Awash in Oil and Gas		
		Base	Policy	% Change	Base	Policy	% Change	Base	Policy	% Change
<b>I. OVERVIEW DATA</b>										
<b>Macroeconomic Variables (billions of 2000\$)</b>										
Real Consumption	\$6,699	\$18,288	\$18,150	-0.8%	\$13,480	\$13,228	-1.9%	\$18,236	\$17,777	-2.5%
Real Investment	\$1,898	\$7,660	\$7,750	1.2%	\$6,496	\$6,599	1.6%	\$7,671	\$7,770	1.3%
Real Government Purchases	\$1,684	\$3,073	\$3,101	0.9%	\$3,073	\$3,110	1.2%	\$3,073	\$3,137	2.1%
Real Exports	\$1,213	\$7,629	\$7,623	-0.1%	\$7,293	\$7,270	-0.3%	\$7,616	\$7,578	-0.5%
Real Imports	\$1,620	\$8,561	\$8,603	0.5%	\$7,891	\$7,931	0.5%	\$8,511	\$8,572	0.7%
TOTAL REAL GDP	\$9,873	\$28,089	\$28,021	-0.2%	\$22,451	\$22,275	-0.8%	\$28,085	\$27,690	-1.4%
<b>Program Spending (billions of 2000\$)</b>										
Deployment Programs	\$0.00	--	\$14.50	--	--	\$19.90	--	--	\$34.00	--
Technology R&D	\$0.00	--	\$7.40	--	--	\$7.80	--	--	\$14.80	--
<b>Macroeconomic Investment Components</b>										
<b>Aggregate Investment Totals (billions of 2000\$)</b>										
Electric Utility	\$4	\$28	\$30	4.4%	\$39	\$41	5.8%	\$27	\$41	49.2%
Infrastructure	\$0	\$58	\$45	-23.0%	\$64	\$27	-57.8%	\$33	-\$111	-440.5%
Efficient Equipment	\$213	\$422	\$489	15.8%	\$424	\$496	17.0%	\$405	\$504	24.4%
Vehicle Purchases	\$384	\$753	\$545	-27.6%	\$507	\$534	5.4%	\$641	\$601	-6.3%
TOTAL ENERGY-RELATED INVESTMENT	\$601	\$1,261	\$1,108	-12.1%	\$1,034	\$1,098	6.2%	\$1,106	\$1,034	-6.5%
<b>Detailed Investment Totals (billions of 2000\$)</b>										
Electric Facilities - Fossil	\$4	\$13	\$10	-27.0%	\$26	\$22	-16.2%	\$22	\$11	-52.3%
Renewable Electricity	\$0	\$15	\$20	30.8%	\$13	\$19	50.9%	\$5	\$30	534.0%
Distributed Generation	\$0	\$12	\$13	8.0%	\$5	\$10	100.0%	\$4	\$9	123.6%
Hydrogen Infrastructure	\$0	\$22	\$40	79.1%	\$36	\$52	45.0%	\$0	\$15	--
Fuel Supply	\$0	\$24	\$20	-18.0%	\$23	\$19	-17.8%	\$28	\$20	-30.3%
Sequestration Investment	\$0	\$0	\$11	--	\$0	\$21	--	\$0	\$16	--
Residential Efficient Equip.	\$77	\$152	\$165	8.7%	\$152	\$167	10.1%	\$146	\$168	14.5%
Commercial Efficient Equip.	\$72	\$140	\$163	16.3%	\$141	\$165	17.1%	\$134	\$167	24.9%
Industrial Efficient Equip.	\$64	\$130	\$161	23.6%	\$132	\$164	24.7%	\$125	\$169	35.3%
Freight & Air Efficiency	\$0	\$0	\$43	--	\$0	\$46	--	\$0	\$60	--
Business Light-Duty Vehicles	\$173	\$234	\$226	-3.3%	\$228	\$220	-3.7%	\$288	\$243	-15.7%
Non-Energy Production	\$0	\$0	-\$39	--	\$0	-\$75	--	\$0	-\$170	--
<b>Expenditures on Imported Oil and Gas (billions of 2000\$)</b>										
Crude Oil Imports	\$92	\$75	\$29	-61.8%	\$127	\$57	-55.6%	\$99	\$46	-53.5%
Petroleum Product Imports	\$31	\$12	\$10	-11.0%	\$23	\$22	-4.7%	\$92	\$10	-89.5%
Natural Gas Imports	\$10	\$41	\$24	-43.0%	\$39	\$27	-29.8%	\$56	\$15	-72.8%
<b>Light-Duty Vehicle Purchases (billions of 2000\$)</b>										
Household Vehicles	\$211	\$286	\$276	-3.3%	\$279	\$269	-3.7%	\$353	\$297	-15.7%
Business Light-Duty Vehicles	\$173	\$234	\$226	-3.3%	\$228	\$220	-3.7%	\$288	\$243	-15.7%
TOTAL LIGHT-DUTY VEHICLES (LDVs)	\$384	\$519	\$502	-3.4%	\$507	\$488	-3.7%	\$641	\$540	-15.7%
Avg Price per Vehicle	\$22,097	\$26,909	\$27,210	1.1%	\$27,772	\$28,931	4.2%	\$25,089	\$28,407	13.2%

**Pew Center  
Year 2035 Comparisons**

	Historical 2000	Technology Triumphs			Turbulent World			Awash in Oil and Gas		
		Base	Policy	% Change	Base	Policy	% Change	Base	Policy	% Change
<b>I. OVERVIEW DATA</b>										
<b>Energy Expenditures by Major Sector (billions of 2000\$)</b>										
Residential	\$144	\$226	\$239	5.7%	\$246	\$249	1.4%	\$236	\$265	12.2%
Commercial	\$118	\$182	\$176	-2.9%	\$202	\$184	-9.1%	\$192	\$199	3.1%
Industrial	\$183	\$231	\$242	4.9%	\$292	\$250	-14.2%	\$290	\$284	-2.0%
Transportation	\$264	\$271	\$237	-12.6%	\$385	\$274	-28.9%	\$437	\$281	-35.8%
TOTAL ECONOMY-WIDE EXPENDITURES	\$709	\$909	\$894	-1.6%	\$1,125	\$957	-14.9%	\$1,156	\$1,028	-11.1%
Average Primary Energy Price (\$/MBtu)	\$7.07	\$7.36	\$9.27	25.9%	\$9.49	\$10.10	6.4%	\$7.84	\$10.70	36.5%
<b>Energy Consumption (Quads)</b>										
Petroleum Products	38.1	36.8	23.2	-37.1%	32.9	22.1	-32.8%	60.0	29.1	-51.4%
Natural Gas	23.4	43.1	37.0	-14.3%	34.6	31.2	-9.9%	55.7	40.0	-28.2%
Coal	23.4	21.6	10.9	-49.3%	32.6	18.7	-42.7%	19.1	3.1	-83.5%
Renewable Energy	6.9	15.1	18.5	23.0%	12.1	16.1	33.9%	7.8	18.9	141.1%
Nuclear Power	8.1	6.6	6.6	-0.3%	6.1	6.5	7.4%	4.4	4.5	3.0%
Other	0.4	0.4	0.4	0.0%	0.4	0.4	0.0%	0.4	0.4	0.0%
TOTAL PRIMARY ENERGY	100.3	123.5	96.5	-21.9%	118.5	95.0	-19.9%	147.4	96.1	-34.8%
TPE / GDP (kBtu / 2000\$)	10.2	4.40	3.44	-21.8%	5.28	4.26	-19.3%	5.25	3.47	-33.9%
<b>Carbon Emissions (MTC)</b>										
Transportation Carbon	511	554	311	-43.9%	490	294	-40.0%	886	403	-54.5%
End Use Carbon	458	668	519	-22.3%	562	460	-18.1%	749	482	-35.6%
Central Station Carbon	589	573	320	-44.2%	802	479	-40.3%	722	241	-66.6%
Captured & Sequestered	0	0	-183	--	0	-263	--	0	-156	--
ECONOMY-WIDE CARBON EMISSIONS	1,559	1,795	967	-46.1%	1,854	970	-47.7%	2,357	970	-58.8%
Carbon-to-GDP Ratio (grams / 2000\$)										
Emissions per \$ Output	158	64	35	-45.3%	82	44	-46.3%	84	35	-58.3%
<b>II. ENERGY PRICE AND SUPPLY</b>										
<b>Carbon Charge (2000\$)</b>										
Carbon Price (\$/metric ton)	\$0		\$229	--	--	\$245	--	--	\$342	--
Carbon Price in Gas (\$/MBtu)	\$0		\$3	--	--	\$4	--	--	\$5	--
Carbon Price in Coal (\$/MBtu)	\$0		\$6	--	--	\$6	--	--	\$9	--
<b>Oil Prices (2000\$)</b>										
World Oil Price (2000\$/bbl)	\$27.70	\$21.60	\$19.20	-11.1%	\$41.70	\$39.80	-4.6%	\$23.10	\$17.70	-23.4%
Crude Oil Price (2000\$/MBtu)	\$4.66	\$3.63	\$3.23	-11.0%	\$7.01	\$6.68	-4.7%	\$3.88	\$2.98	-23.2%
<b>Petroleum Supply (Quads)</b>										
Domestic Crude Oil	15.0	13.7	12.2	-10.9%	13.3	12.1	-9.2%	16.4	13.0	-20.7%
Imports Crude Oil	19.7	20.7	8.9	-57.0%	18.1	8.5	-53.4%	25.5	15.5	-39.5%
Imports Petroleum Products	4.7	2.3	2.3	0.0%	2.3	2.3	0.0%	16.9	2.3	-86.4%

**Pew Center  
Year 2035 Comparisons**

	Historical 2000	Technology Triumphs			Turbulent World			Awash in Oil and Gas		
		Base	Policy	% Change	Base	Policy	% Change	Base	Policy	% Change
<b>I. OVERVIEW DATA</b>										
<b>Natural Gas Supply (Quads)</b>										
Domestic Gas Production	19.6	32.6	28.7	-11.9%	25.9	23.7	-8.3%	42.1	32.1	-23.6%
Imports of Gas	3.9	10.5	8.2	-21.6%	8.7	7.4	-14.5%	13.7	7.9	-42.3%
TOTAL GAS DEMAND	23.4	43.1	37.0	-14.3%	34.6	31.2	-9.9%	55.7	40.0	-28.2%
<b>Natural Gas Prices (2000\$)</b>										
Wellhead Gas Price (\$/Mcf)	\$2.76	\$4.04	\$2.94	-27.2%	\$4.58	\$3.76	-17.9%	\$4.18	\$1.96	-53.1%
Industrial Gas Price (\$/MBtu)	\$3.65	\$4.72	\$6.78	43.6%	\$5.35	\$7.98	49.2%	\$4.89	\$7.29	49.1%
Commercial Gas Price (\$/MBtu)	\$7.39	\$6.30	\$7.77	23.3%	\$7.21	\$9.41	30.5%	\$6.54	\$7.77	18.8%
Residential Gas Price (\$/MBtu)	\$8.51	\$7.42	\$8.89	19.8%	\$8.33	\$10.53	26.4%	\$7.66	\$8.89	16.1%
<b>Electric Utility Gas Price (\$/MBtu)</b>										
Without Carbon Charge	\$3.19	\$4.66	\$3.39	-27.3%	\$5.28	\$4.34	-17.8%	\$4.82	\$2.26	-53.1%
With Carbon Charge	\$3.19	\$4.66	\$6.73	44.4%	\$5.28	\$7.92	50.0%	\$4.82	\$7.26	50.6%
<b>Avg Electricity Price (2000\$/MWh)</b>										
Industrial Electricity Price	\$67.00	\$69.00	\$92.00	33.3%	\$78.00	\$93.00	19.2%	\$63.00	\$102.00	61.9%
Commercial Electricity Price	\$45.00	\$52.00	\$75.00	44.2%	\$61.00	\$76.00	24.6%	\$46.00	\$86.00	87.0%
Residential Electricity Price	\$73.00	\$70.00	\$93.00	32.9%	\$78.00	\$93.00	19.2%	\$63.00	\$103.00	63.5%
	\$81.00	\$84.00	\$107.00	27.4%	\$92.00	\$108.00	17.4%	\$77.00	\$117.00	51.9%
<b>III. TOTAL PRIMARY ENERGY SUPPLY BY FUEL AND SECTOR</b>										
<b>Petroleum Products (Quads)</b>										
Transport Petroleum	25.7	27.8	15.6	-43.7%	24.5	14.7	-39.9%	44.3	20.2	-54.4%
Other Petroleum	12.4	9.1	7.5	-17.0%	8.3	7.4	-11.6%	15.7	9.0	-42.9%
TOTAL PETROLEUM	38.1	36.8	23.2	-37.1%	32.9	22.1	-32.8%	60.0	29.1	-51.4%
<b>Natural Gas (Quads)</b>										
Central Station Natural Gas	4.2	4.9	5.9	21.5%	2.9	4.2	43.0%	19.3	12.9	-33.4%
Sector Natural Gas	19.2	37.6	29.7	-21.2%	31.5	26.8	-14.7%	36.2	26.4	-27.2%
Transport Natural Gas	0.0	0.1	0.1	-7.7%	0.2	0.2	-11.1%	0.2	0.1	-40.0%
Natural Gas Reformulated to Hydrogen	0.0	0.5	1.3	166.0%	0.0	0.0	--	0.0	0.7	--
TOTAL NATURAL GAS	23.4	43.1	37.0	-14.3%	34.6	31.2	-9.9%	55.7	40.0	-28.2%
<b>Coal (Quads)</b>										
Coal Generation	20.8	19.5	6.5	-66.8%	28.6	12.3	-57.0%	17.0	2.0	-88.1%
Other Sector Coal	2.6	2.0	1.2	-39.3%	2.1	1.3	-36.4%	2.1	1.1	-47.1%
IGCC for Hydrogen	0.0	0.1	3.3	3160.0%	1.9	5.0	163.9%	0.0	0.0	--
TOTAL COAL	23.4	21.6	10.9	-49.3%	32.6	18.7	-42.7%	19.1	3.1	-83.5%
<b>Renewable Energy (Quads)</b>										
Renewable Energy for Transport	0.2	0.8	1.3	57.1%	1.0	1.4	32.7%	0.2	0.9	278.3%
Electric Generation Renewables	3.8	8.1	10.0	23.0%	6.8	9.5	40.6%	3.9	11.5	199.2%
Wind Power to Produce Hydrogen	0.0	0.4	1.1	163.4%	0.0	0.0	--	0.0	0.6	--
On Site Renewable Energy	2.9	5.7	6.2	8.1%	4.3	5.3	23.7%	3.8	5.9	56.8%
TOTAL RENEWABLE ENERGY	6.9	15.1	18.5	23.0%	12.1	16.1	33.9%	7.8	18.9	141.1%



**Pew Center  
Year 2035 Comparisons**

I. OVERVIEW DATA	Historical	Technology Triumphs			Turbulent World			Awash in Oil and Gas		
	2000	Base	Policy	% Change	Base	Policy	% Change	Base	Policy	% Change
<b>Hydrogen Production (Quads)</b>										
Hydrogen from Natural Gas	0.0	0.4	1.0	162.2%	0.0	0.0	--	0.0	0.6	--
Hydrogen from Renewables	0.0	0.1	0.3	166.7%	0.0	0.0	--	0.0	0.2	--
Hydrogen from Coal Gasification	0.0	0.0	1.5	3575.0%	0.9	2.3	164.0%	0.0	0.0	--
TOTAL HYDROGEN SUPPLY	0.0	0.5	2.8	420.8%	0.9	2.3	164.0%	0.0	0.7	--
<b>IV. ELECTRICITY SUPPLY</b>										
<b>Electricity Supply-Demand Balance (TWh)</b>										
Electricity End-Use Demand	3,569	5,739	4,645	-19.1%	5,636	4,539	-19.5%	6,337	4,841	-23.6%
Large CHP	369	792	773	-2.4%	440	632	43.6%	565	528	-6.5%
Distributed Generation - excluding Wind Power	2	777	844	8.6%	335	677	102.1%	296	638	115.5%
Total Large CHP and Other DG	370	1,569	1,617	3.1%	775	1,310	69.0%	861	1,166	35.4%
Amount for Own Use	187	847	873	3.1%	419	707	68.7%	465	630	35.5%
Sales to Grid	183	722	744	3.0%	357	602	68.6%	396	537	35.6%
Electric Generators Load	3,458	4,448	3,234	-27.3%	5,158	3,439	-33.3%	5,816	3,909	-32.8%
Net Imports	35	35	35	0.0%	35	35	0.0%	35	35	0.0%
Total to Grid	3,676	5,205	4,012	-22.9%	5,550	4,077	-26.5%	6,247	4,480	-28.3%
Sales from Grid	3,382	4,892	3,772	-22.9%	5,217	3,832	-26.5%	5,873	4,211	-28.3%
T&D Losses	294	312	241	-22.8%	333	245	-26.4%	375	269	-28.3%
<b>CHP and Other Distributed Generation (TWh)</b>										
Conventional CHP	356	943	920	-2.4%	498	759	52.4%	743	642	-13.6%
Municipal Solid Waste	14	10	10	0.0%	10	10	0.0%	10	10	0.0%
Fuel Cell CHP	0	376	394	4.8%	187	363	94.1%	72	213	195.8%
Building Integrated PV	1	239	292	22.2%	80	177	121.3%	36	301	736.1%
<b>Electricity Generation, excluding CHP and Other DG (TWh)</b>										
Coal	1,907	2,061	540	-73.8%	3,256	1,157	-64.5%	1,771	213	-88.0%
Gas and Oil	533	713	804	12.8%	403	538	33.5%	2,977	1,679	-43.6%
Biomass Gasification	0	43	50	16.3%	34	46	35.3%	11	55	400.0%
Nuclear	752	752	752	0.0%	713	713	0.0%	572	572	0.0%
Hydro	321	321	321	0.0%	321	321	0.0%	321	321	0.0%
Wind	9	382	575	50.5%	300	485	61.7%	118	847	617.8%
Geothermal	16	176	192	9.1%	132	180	36.4%	46	221	380.4%
TOTAL LOAD	3,458	4,448	3,234	-27.3%	5,158	3,439	-33.3%	5,816	3,909	-32.8%
<b>Fuel Use, excluding CHP and Other DG (Quads)</b>										
Coal	20.8	19.6	9.7	-50.3%	30.5	17.3	-43.2%	17.0	2.0	-88.1%
Petroleum	1.2	0.0	0.0	-50.0%	0.0	0.0	-50.0%	0.0	0.0	100.0%
Natural Gas	4.2	4.9	5.9	21.5%	2.9	4.2	43.0%	19.3	12.9	-33.4%
Biomass Co-firing and Other Fuels	0.1	0.0	0.1	25.0%	0.0	0.1	50.0%	0.0	0.1	25.0%
Net Imports Btu Equivalent	0.4	0.3	0.3	0.0%	0.3	0.3	6.7%	0.3	0.3	3.7%
Fossil HeatRate (Btu/kWh)	10,729	8,769	8,734	-0.4%	8,511	9,146	7.5%	7,649	7,887	3.1%

**Pew Center  
Year 2035 Comparisons**

	Historical 2000	Technology Triumphs			Turbulent World			Awash in Oil and Gas		
		Base	Policy	% Change	Base	Policy	% Change	Base	Policy	% Change
<b>I. OVERVIEW DATA</b>										
<b>Conventional Air Emissions</b>										
SO <sub>2</sub> (thous tons)	12,767	2,984	769	-74.2%	2,186	1,039	-52.5%	1,592	198	-87.6%
NO <sub>x</sub> (thous tons)	5,905	1,752	627	-64.2%	1,627	791	-51.4%	1,476	480	-67.5%
Mercury (tons)	49	11	3	-74.5%	9	5	-50.3%	9	1	-91.0%
<b>Investment Flows (millions of 2000\$)</b>										
Gas Facilities	\$4,124	\$5,332	\$708	-86.7%	\$3,475	\$1,701	-51.1%	\$18,213	\$6,514	-64.2%
Coal Facilities	\$0	\$7,823	\$8,904	13.8%	\$22,525	\$20,067	-10.9%	\$4,228	\$4,228	0.0%
Renewable Facilities	\$110	\$15,295	\$20,045	31.1%	\$12,859	\$19,371	50.6%	\$4,700	\$29,788	533.8%
Total (non-DG) Facilities	\$4,234	\$28,449	\$29,657	4.2%	\$38,859	\$41,140	5.9%	\$27,142	\$40,531	49.3%
TOTAL DISTRIBUTED GENERATION	\$0	\$11,671	\$12,627	8.2%	\$4,750	\$9,529	100.6%	\$4,161	\$9,309	123.7%
<b>Operations and Maintenance (millions of 2000\$)</b>										
Coal Facilities	\$17,760	\$15,193	\$7,245	-52.3%	\$25,008	\$12,995	-48.0%	\$13,241	\$3,343	-74.8%
Gas Facilities	\$1,141	\$3,158	\$2,668	-15.5%	\$2,179	\$1,812	-16.8%	\$10,372	\$4,573	-55.9%
Hydro Facilities	\$3,120	\$3,120	\$3,120	0.0%	\$3,120	\$3,120	0.0%	\$3,120	\$3,120	0.0%
Renewable Facilities	\$379	\$7,170	\$9,254	29.1%	\$5,971	\$8,913	49.3%	\$2,220	\$13,520	509.0%
TOTAL O&M COSTS	\$22,400	\$28,641	\$22,287	-22.2%	\$36,279	\$26,840	-26.0%	\$28,954	\$24,556	-15.2%
<b>IV. TRANSPORTATION ENERGY USE</b>										
<b>Vehicle Miles Travelled (LDVs including Light Commercial Trucks)</b>										
VMT (billions)	2,396	3,823	3,673	-3.9%	3,659	3,446	-5.8%	4,682	3,757	-19.8%
<b>New Vehicle On-Road Average Fuel Economy Calculations</b>										
New Car Avg Fuel Economy	22.8	47.1	74.4	58.0%	52.3	71.7	37.1%	25.6	62.8	145.3%
New Light Truck Avg Fuel Economy	17.0	35.7	57.3	60.5%	40.2	55.8	38.8%	19.2	48.6	153.1%
Overall LDV On-Road Fuel Economy	19.8	40.6	65.4	61.1%	45.9	63.4	38.1%	22.0	55.3	151.4%
<b>New Light-Duty Vehicle Sales by Technology (1000s)</b>										
Conventional Vehicle	17,256	6,202	0	-100.0%	4,358	0	-100.0%	24,081	0	-100.0%
Dedicated CNG Vehicle	48	172	164	-4.7%	274	254	-7.3%	227	169	-25.6%
Advanced Diesel & Other Advanced ICEs	0	4,735	2,804	-40.8%	4,353	2,660	-38.9%	0	3,283	--
Hybrid Electric Vehicle	52	4,304	4,536	5.4%	3,301	4,981	50.9%	1,241	11,969	864.5%
FCV with On-Board Reformer	0	0	0	--	0	0	--	0	0	--
Hydrogen FCV	0	3,880	10,935	181.8%	5,975	8,988	50.4%	0	3,604	--
Electric Vehicles	0	0	0	--	0	0	--	0	0	--
TOTAL LDV SALES	17,355	19,292	18,440	-4.4%	18,262	16,883	-7.6%	25,549	19,025	-25.5%

**Pew Center  
Year 2035 Comparisons**

I. OVERVIEW DATA	Historical	Technology Triumphs			Turbulent World			Awash in Oil and Gas		
	2000	Base	Policy	% Change	Base	Policy	% Change	Base	Policy	% Change
<b>Transportation Energy Consumption by Fuel Type (excluding pipeline natural gas use) - Quads</b>										
Motor Gasoline	15.8	10.7	4.5	-58.1%	8.7	4.5	-48.3%	26.8	8.1	-69.7%
Diesel Fuel	5.2	10.5	6.1	-42.4%	10.1	5.8	-42.7%	9.7	6.5	-32.9%
Jet Fuel	3.6	5.2	3.8	-27.2%	4.5	3.2	-28.8%	6.4	4.2	-34.5%
Residual and Other Petroleum	1.1	1.3	1.3	0.0%	1.2	1.3	5.7%	1.3	1.3	-1.5%
Petroleum Subtotal	25.7	27.8	15.6	-43.7%	24.5	14.7	-39.9%	44.3	20.2	-54.4%
Natural Gas Fuel	0.0	0.1	0.1	-7.7%	0.2	0.2	-11.1%	0.2	0.1	-40.0%
Biofuels to Replace Gasoline	0.1	0.5	0.7	57.4%	0.6	0.8	29.0%	0.2	0.5	218.8%
Bio-Diesel	0.0	0.1	0.2	50.0%	0.1	0.2	54.5%	0.0	0.1	--
Hydrogen	0.0	0.5	2.8	420.8%	0.9	2.3	164.0%	0.0	0.7	--
Electricity	0.1	0.1	0.1	0.0%	0.1	0.1	0.0%	0.1	0.1	0.0%
TOTAL DELIVERED ENERGY	25.9	29.1	19.5	-32.9%	26.4	18.2	-30.9%	44.8	21.7	-51.4%
<b>New Light-Duty Vehicle Shares by Technology (pct)</b>										
Conventional Vehicle	99%	32.1	0.0	-100.0%	23.9	0.0	-100.0%	94.3	0.0	-100.0%
Dedicated CNG Vehicle	0%	0.9	0.9	0.0%	1.5	1.5	0.0%	0.9	0.9	0.0%
Advanced Diesel & Other Advanced ICES	0%	24.5	15.2	-38.0%	23.8	15.8	-33.6%	0.0	17.3	--
Hybrid Electric Vehicle	0%	22.3	24.6	10.3%	18.1	29.5	63.0%	4.9	62.9	1183.7%
FCV with On-Board Reformer	0%	0.0	0.0	--	0.0	0.0	--	0.0	0.0	--
Hydrogen FCV	0%	20.1	59.3	195.0%	32.7	53.2	62.7%	0.0	18.9	--
Electric Vehicles	0%	0.0	0.0	--	0.0	0.0	--	0.0	0.0	--
TOTAL PERCENTAGE	100%	100.0	100.0	0.0%	100.0	100.0	0.0%	100.0	100.0	0.0%
<b>New Light-Duty Vehicle Shares by Detailed Size Class(pct)</b>										
Sub-compact Car	15%	10.8	22.4	107.4%	18.8	22.4	19.1%	10.5	22.4	113.3%
Compact Car	18%	13.6	14.9	9.6%	18.6	14.9	-19.9%	13.9	14.9	7.2%
Medium Car	20%	21.1	14.8	-29.9%	14.0	14.8	5.7%	21.0	14.8	-29.5%
X-Large Car	4%	4.3	1.7	-60.5%	2.6	1.7	-34.6%	4.4	1.7	-61.4%
Mini-vans	11%	11.5	11.5	0.0%	11.5	11.5	0.0%	11.5	11.5	0.0%
Regulr SUV	10%	13.6	14.8	8.8%	12.6	14.8	17.5%	12.5	14.8	18.4%
Large SUV	1%	5.6	1.7	-69.6%	3.9	1.7	-56.4%	6.7	1.7	-74.6%
Pick-up or Van	21%	19.5	18.0	-7.7%	18.0	18.0	0.0%	19.5	18.0	-7.7%
TOTAL PERCENTAGE	100%	100.0	100.0	0.0%	100.0	100.0	0.0%	100.0	100.0	0.0%
<b>New Light-Duty Vehicles by Major Size Class (1000)</b>										
Small Car	5,669	4,712	6,890	46.2%	6,824	6,308	-7.6%	6,241	7,109	13.9%
Large Car	4,177	4,896	3,055	-37.6%	3,026	2,797	-7.6%	6,484	3,152	-51.4%
Mini-van	1,948	2,224	2,126	-4.4%	2,105	1,946	-7.6%	2,945	2,193	-25.5%
SUV	1,905	3,704	3,048	-17.7%	3,019	2,791	-7.6%	4,906	3,145	-35.9%
Cargo Vehicle	3,657	3,756	3,321	-11.6%	3,289	3,041	-7.5%	4,974	3,427	-31.1%
TOTAL LDV SALES	17,355	19,292	18,440	-4.4%	18,262	16,883	-7.6%	25,549	19,025	-25.5%
<b>Fuel Consumption by Transportation Mode (excludes Specialized Petroleum Products such as Lubricants) - Quads</b>										
Total LDV Fuel Use	15.0	12.6	8.4	-33.6%	11.1	8.1	-27.7%	25.9	9.9	-61.6%
Commercial Truck Fuel	0.7	0.9	0.5	-46.2%	0.9	0.5	-48.9%	1.0	0.5	-53.8%
Freight Truck Fuel	4.3	7.4	3.9	-46.8%	7.0	3.7	-47.8%	8.3	4.1	-50.5%
Jet Fuel	3.6	5.2	3.8	-27.2%	4.5	3.2	-28.8%	6.4	4.2	-34.5%
Train Fuel	0.6	0.9	0.8	-3.5%	0.8	0.8	-4.8%	0.9	0.8	-8.8%
Marine Fuel	1.5	1.8	1.8	0.0%	1.7	1.7	3.0%	1.8	1.8	-1.6%
TOTAL FUEL USE	25.6	28.8	19.2	-33.3%	26.0	17.9	-31.3%	44.4	21.4	-51.8%