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Planning & Analysis Issues

Issue Brief 1991-02

January 11, 1991

1991 A.G.A.-TERA Base Case

Background

Natural gas consumption in the United States grew 15.9 percent between 1986 and 1989. Its share of total primary energy use in the United States grew from 22.5 percent to 23.8 percent. Despite unusually warm weather and an economic downturn, natural gas use in the first eight months of 1990 fell only modestly from its 1989 pace -- while its market share of U.S. total primary energy use has remained stable.

The 1986-to-1990 trend of increased natural gas use contrasts sharply with the previous thirteen years. Natural gas use in the United States fell 25.8 percent between 1973 and 1986. Its share of U.S. total primary energy fell from 30.3 percent to 22.5 percent.

The natural gas industry in the United States appears to have "turned the corner" in 1986, and to be overcoming the negative legacy of over-regulation (and ensuing market disruption) preceding enactment of the Natural Gas Policy Act (NGPA) in 1978 and the Natural Gas Decontrol Act (NGDA) in 1989.

Projections ^{1/}

The American Gas Association's **Total Energy Resource Analysis** energy modeling system (A.G.A.-TERA) projects continued growth in natural gas demand and supply. A new twenty-year **Base Case** outlook through 2010 has been developed. It features updated data, revised projections of economic growth, effects of the Persian Gulf crisis, effects of the Clean Air Act Amendments, and many recalibrated equations.

^{1/} Conceived in the early 1970s; updated, recalibrated, expanded, and modernized repeatedly ever since; the A.G.A.-TERA model has been used continuously to simulate the impacts of policies, energy prices, economic trends, and other matters on U.S. energy markets. A.G.A.-TERA Base Cases, produced periodically, represent "no surprises, business as usual" projections incorporating current conditions, economic expectations and policies into the most up-to-date version of the model.

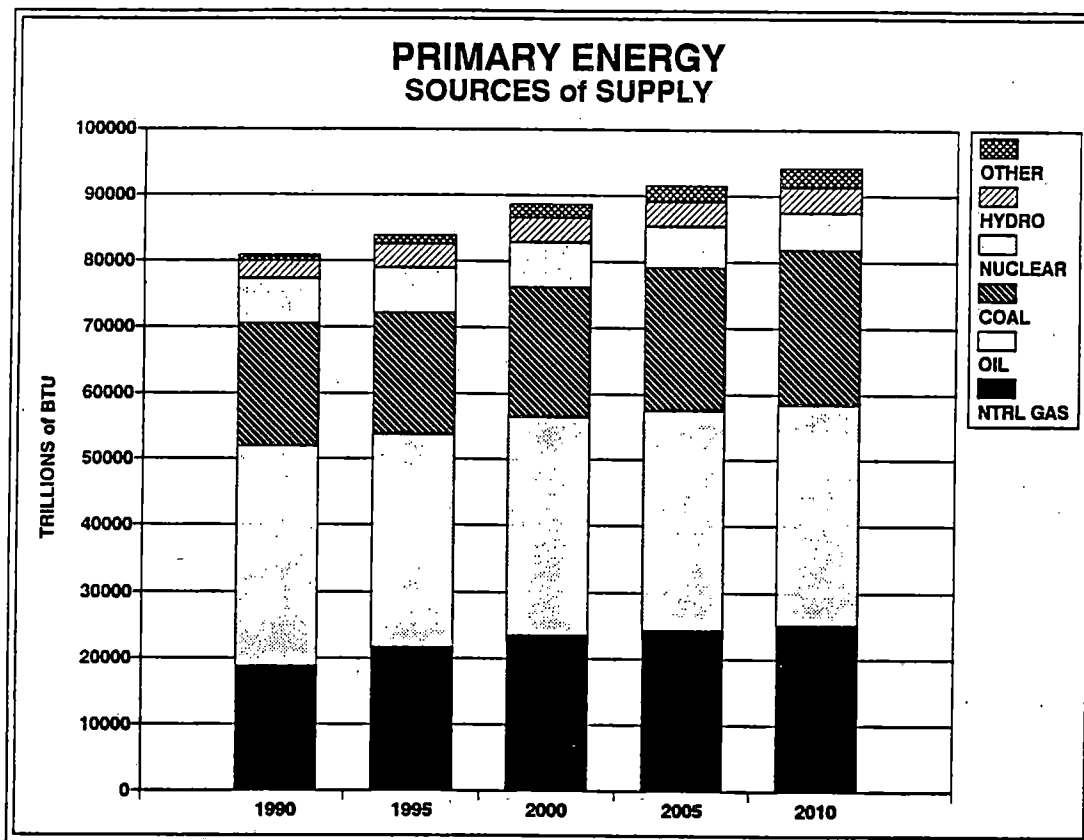
Demand

Natural Gas is projected to gain a growing share of total U.S. primary energy use (see Figure 1).

Total primary energy use in the United States is projected to grow 16.5 percent (0.8 percent-per-year, on average) from 81.3 Quadrillion Btu (Quads) in 1990 to 94.5 Quads in 2010. Natural gas consumption, however, is projected to climb roughly twice as rapidly as overall U.S. energy growth -- and register a 34.0 percent gain over the twenty-year period (1.5 percent-per-year, on average) from 18.8 Quads in 1990 to 25.2 Quads in 2010.

The natural gas share of U.S. primary energy consumption is projected to grow from 23.9 percent in 1990 to 26.6 percent by 2000 and beyond.

Figure 1



Oil use is projected to remain stable at about 33.1 Quads-per-year throughout the projection. Growth in transportation is offset by declines in boilers and other stationary applications. Oil's share of U.S. total primary energy is projected to decline from 40.7 percent in 1990 to 35.3 percent in 2010.

Coal use is projected to grow slightly faster than overall energy use, and increase its share of total primary energy from 23.2 percent in 1990 to 24.9 percent in 2010.

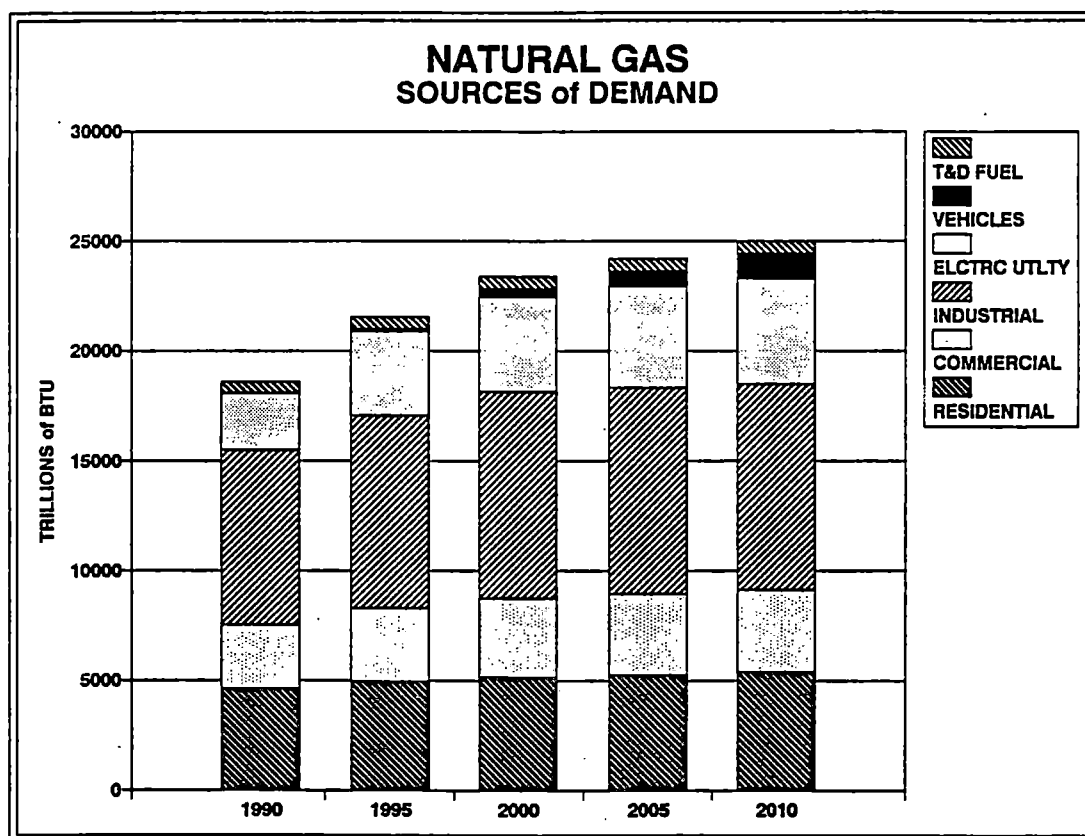
Much of the growth in natural gas demand is projected to occur in applications where stringent environmental regulations favor natural gas (see Figure 2).

Three-quarters of the growth is projected to occur in electricity generation and natural gas vehicles (NGVs). By 2010, electric utilities are projected to consume 4.8 Quads and NGVs 1.2 Quads.

Natural gas consumption in the industrial sector as a whole is projected to grow at an average annual rate of 0.8 percent-per-year between 1990 and 2010 (16.6 percent growth over the period) from 8.0 Quads in 1990 to 9.4 Quads in 2010. Non-utility generators (NUGs), growing 6.2 percent-per-year, are projected to offset declines in traditional industrial applications. NUGs are projected to consume 3.4 Quads by 2010. An additional 6.1 Quads of natural gas is projected to be consumed in traditional industrial applications in 2010.

The commercial sector represents a small but growing component of natural gas use. Its 29.0 percent growth from 1990 to 2010 (1.3 percent-per-year, on average) reflects the effects of such factors as strong growth of service industries and increased competition with electricity and fuel oil in applications (such as cooling) where natural gas has had little historical role.

Figure 2



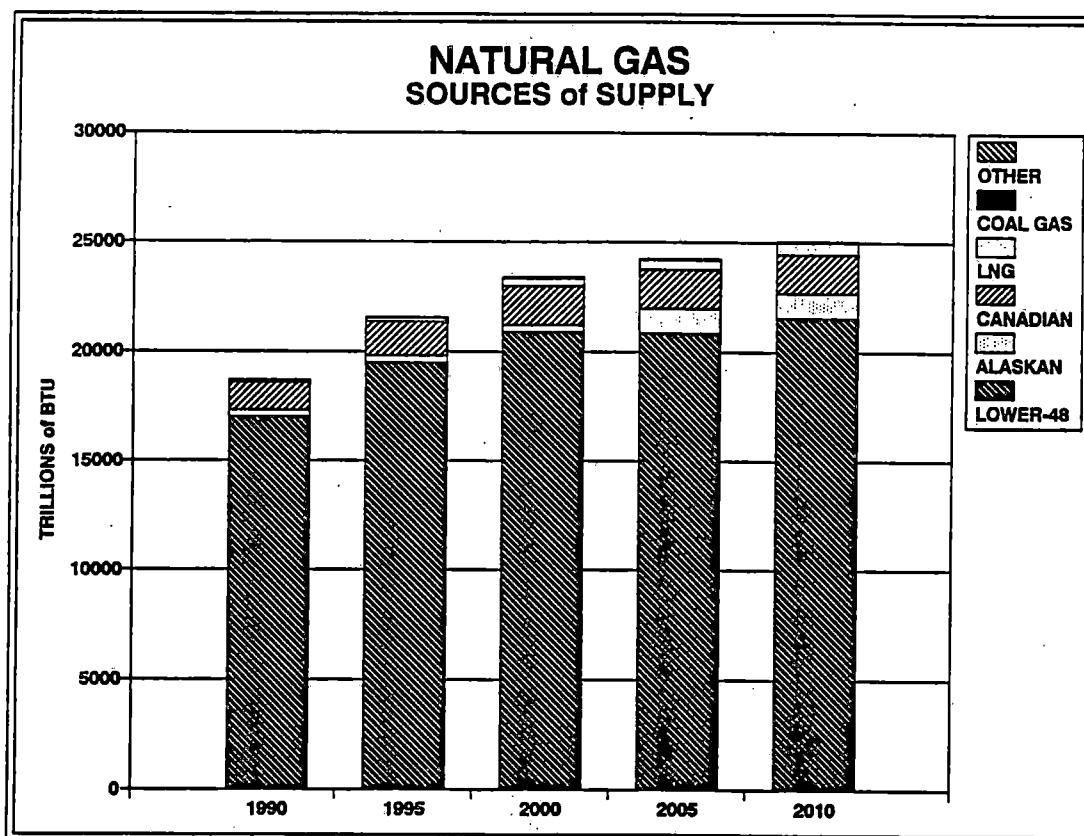
Natural gas use in the residential sector is projected to grow slowly. The assumptions incorporated in the Base Case exclude several not-yet-enacted policy options that could potentially encourage (or mandate) natural gas rather than electricity or oil in some residential applications. If either environmental, conservation, energy security, or demand-side-management concerns result in future policies that shift residential energy use towards natural gas, then growth could be greater than projected in this case.

Supply

Natural gas supply is projected to remain primarily composed of Lower-48 gas (see Figure 3).

Supplemental natural gas supply sources are projected to remain at present levels, except: a) Imports from Canada are projected to grow to 1.8 Tcf-per-year by 2000 and remain at that level, b) imports of LNG are projected to climb to 0.4 Tcf by 2000 and 0.6 Tcf by 2010, and c) pipeline shipments from Alaska to the Lower-48 are projected to reach 0.8 Tcf by 2010. Growth of imports and other supplementals at these levels is consistent with currently envisioned projects to construct new pipeline capacity and reactivate existing decommissioned LNG facilities.

Figure 3



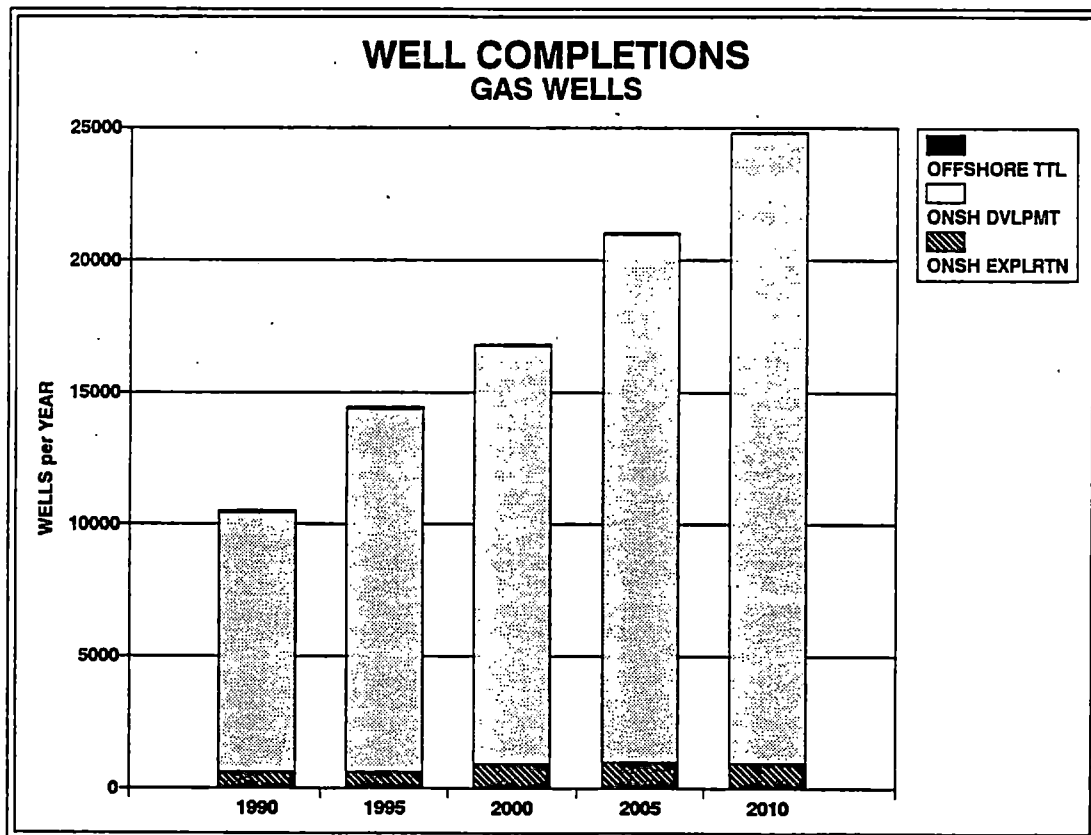
Domestic Lower-48 natural gas is projected to grow from about 16.5 Trillion Cubic Feet (Tcf) in 1990 to 20.8 Tcf in 2010. Since, however, U.S. natural gas consumption is projected to increase even more, the relative role of domestic Lower-48 natural gas is projected to decline -- from 90.0 percent in 1990 to 85.2 percent in 2010.

Increased natural gas imports and additional supplemental natural gas supplies, such as bringing Alaskan natural gas down to the Lower-48, are projected to represent not more than one-sixth of total U.S. natural gas supplies by 2010. Natural gas is projected to remain far less vulnerable than oil to foreign disruptions throughout the period.

Having bottomed-out at 8.0 thousand gas well completions in 1986, drilling for natural gas has increased for four years in a row, and in 1990 is expected to be 30.8 percent above the 1986 low (an average annual growth rate of 6.9 percent-per-year). Gas well completions are projected to grow between 1990 and 2010 (see Figure 4).

Both the 37.4 percent increase to 14.5 thousand gas wells by 1995 (representing an average annual growth rate of 6.6 percent-per-year) and the subsequent 71.5 percent growth to 24.8 thousand gas wells in 2010 (an average annual growth rate of 3.7 percent-per-year between 1995 and 2010) appear well within the demonstrated capabilities of the industry.

Figure 4



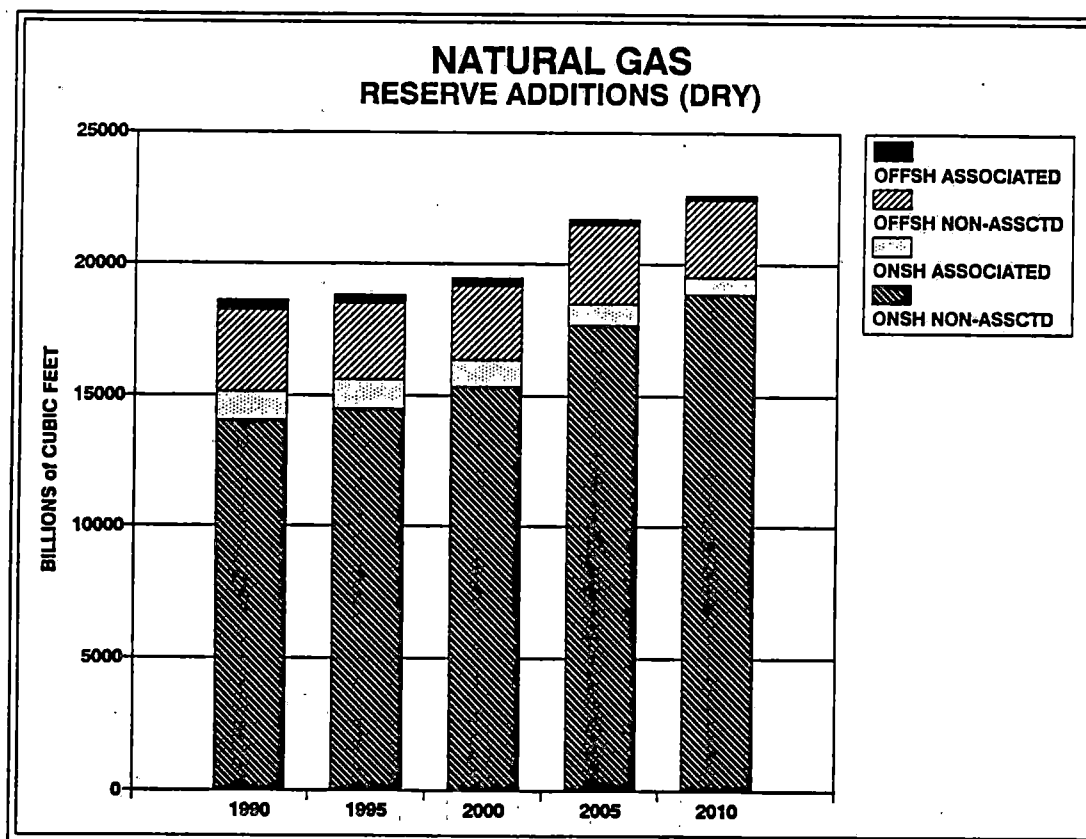
Lower-48 reserve additions of dry natural gas averaged 15.6 Tcf-per-year between 1986 and 1989, nearly double the pre-NGPA rate of the mid-1970s -- a time when conventional wisdom proclaimed the United States was "running out" of natural gas. Recent trends in drilling, findings per well and, consequently, reserve additions -- excluding the tumultuous period from 1979 through 1985 that transformed nearly every aspect of the natural gas industry -- are the very opposite of those in the dark 1960s-to-1970s period.

Continued improvements in technologies for finding, developing and producing natural gas are projected to make economically attractive natural gas resources previously dismissed as unconventional and/or uneconomical. Some newly-emerging technologies enable individual wells to penetrate more producing zones per well -- thus offsetting the declining findings per well trend once thought to signal impending exhaustion of the natural gas resource base.

Growing numbers of gas well completions and continued technological advances, combined, are projected to generate growth in natural gas reserve additions (see Figure 5).

Non-associated natural gas reserve additions are projected to grow steadily, while associated-dissolved additions are projected to decline slightly. The shift reflects the relatively poor prospects for future additions to U.S. oil (and, hence, associated-dissolved natural gas) reserves.

Figure 5



Between 1990 and 2010, reserve additions are projected to total 428.8 Tcf. When these reserve additions are balanced against projected natural gas production (demand minus imports and supplemental gas supplies), the level of reserves is projected to remain adequate to sustain the projected levels of production throughout the period.

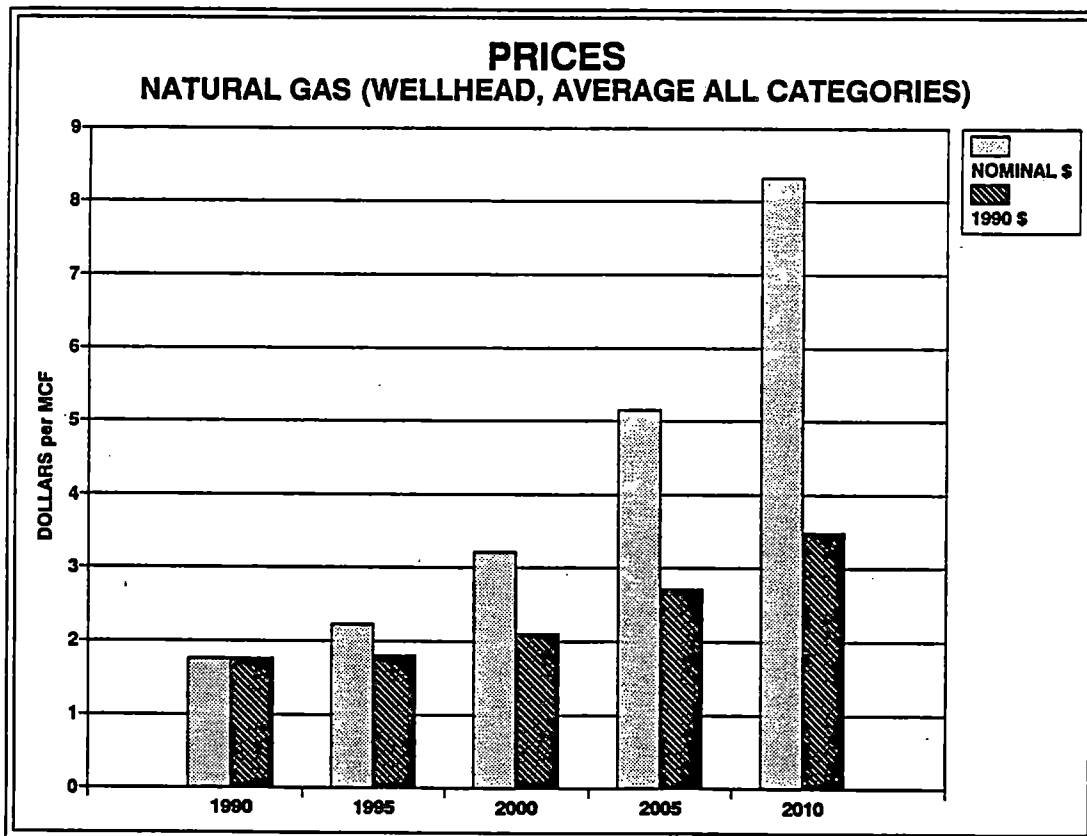
Prices

Natural gas prices are projected to be sufficient to encourage growth in well completions and reserve additions, yet competitive with electricity, fuel oil and other alternative forms of energy.

The composite average wellhead price of natural gas in the United States is projected to increase gradually throughout the period, reaching a level of \$3.50 per Million cubic feet (Mcf) in 2010 -- measured in inflation-free "constant value" 1990 dollars -- (see Figure 6).

Wellhead prices are projected to roughly track inflation through 1995, then begin to rise somewhat faster than inflation. Taking the 1990-to-2010 period as a whole, wellhead prices are projected to rise about 3.5 percent-per-year faster than inflation, on average.

Figure 6

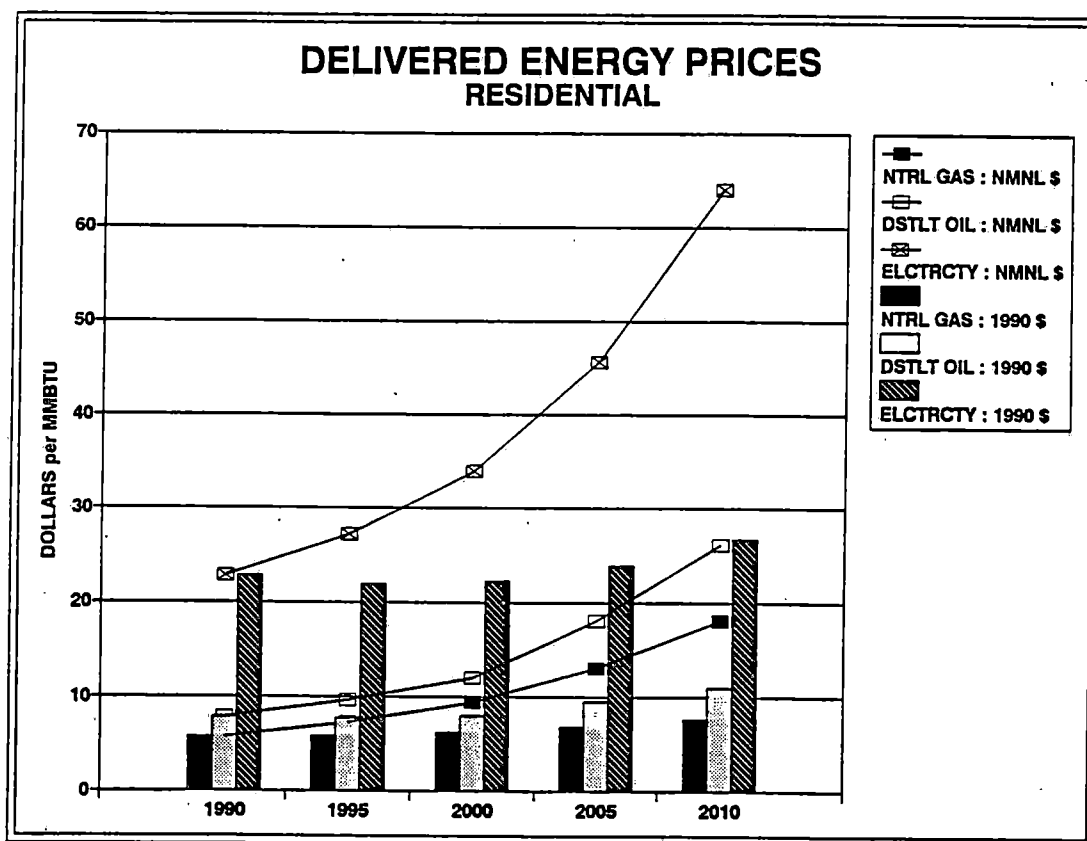


The U.S. average price of natural gas delivered to residential users -- measured in inflation-free "constant value" dollars -- is projected to rise only slightly (see Figure 7).

Delivered residential natural gas prices are projected to roughly track inflation through 1995, then begin to rise somewhat faster than inflation. Taking the 1990-to-2010 period as a whole, the U.S. average price of natural gas to residential users is projected to rise at an average rate of 1.4 percent-per-year, on average.

- o On a Btu basis, electricity is projected to cost residential users in the United States, on average, 3.5 to 4.0 times more than natural gas throughout the period.
- o On a Btu basis, fuel oil is projected to cost residential users in the United States, on average, 30 to 40 percent more than natural gas throughout the period.

Figure 7

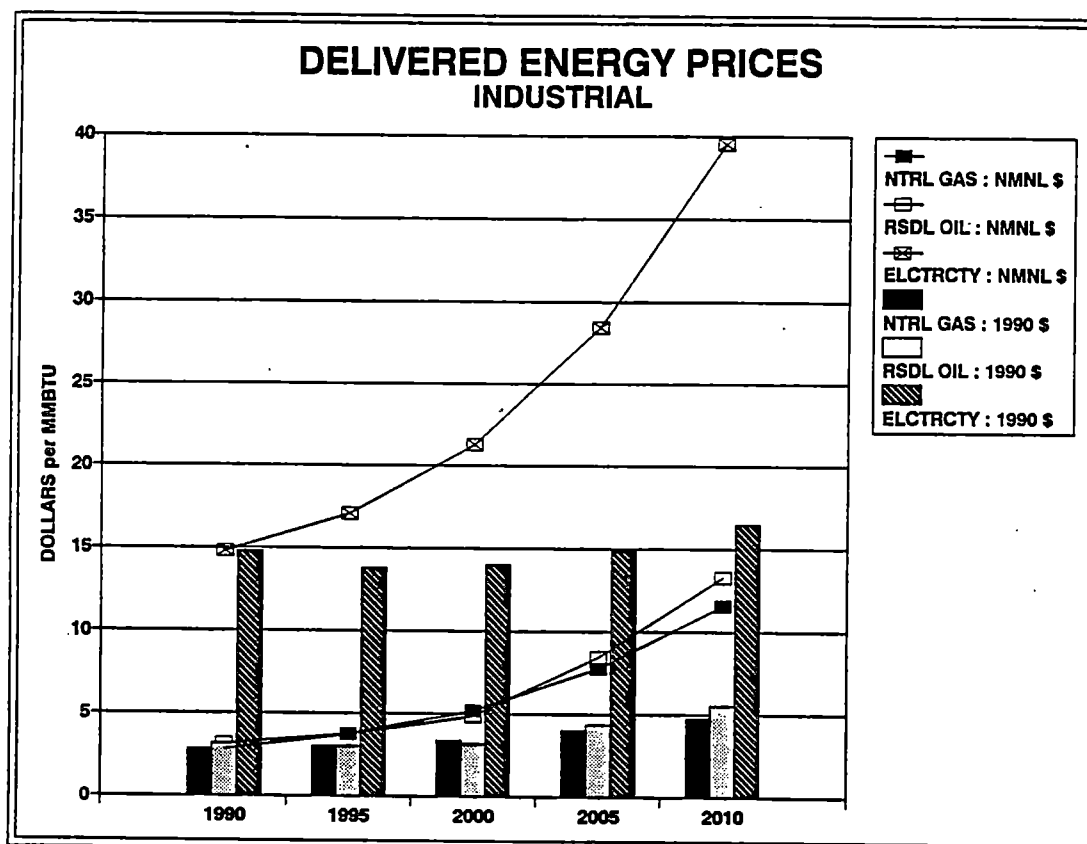


The U.S. average price of natural gas delivered to industrial users -- measured in inflation-free "constant value" dollars -- is projected to rise moderately (see Figure 8).

Delivered industrial natural gas prices are projected to roughly track inflation through 1995, then begin to rise somewhat faster than inflation. Taking the 1990-to-2010 period as a whole, the U.S. average price of natural gas to industrial users is projected to rise at an average rate of 2.6 percent-per-year, on average.

- o On a Btu basis, electricity is projected to cost industrial users in the United States, on average, 3.4 to 4.5 times more than natural gas throughout the period.
- o On a Btu basis, residual fuel oil and natural gas are projected to remain very cost-competitive to industrial users in the United States, on average, throughout the period.

Figure 8



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A.G.A.-TERA

1991 Base Case

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Plotting Points for Graphs

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A.G.A.-TERA 1991 BASE CASE : 12/14/90

PROJECTED WELLHEAD PRICES

YEAR	NOMINAL \$		1990 \$		5-YR AVERAGE GROWTH RATE		AVG GROWTH RATE SINCE 1990	
	OIL	NTRL GAS	OIL	NTRL GAS	OIL	NTRL GAS	OIL	NTRL GAS
	(\$/BL)	(\$/MCF)	(\$/BL)	(\$/MCF)	(PRCNT) (PER YR)	(PRCNT) (PER YR)	(PRCNT) (PER YR)	(PRCNT) (PER YR)
1990	25.00	1.75	25.00	1.75				
1995	28.39	2.23	22.92	1.80	-1.72%	0.57%	-1.72%	0.57%
2000	34.84	3.21	22.89	2.11	-0.03%	3.21%	-0.88%	1.88%
2005	58.77	5.16	30.88	2.71	6.18%	5.16%	1.42%	2.96%
2010	90.53	8.32	37.91	3.48	4.19%	5.14%	2.10%	3.50%

SOURCES

SCENARIO "ON91570Q" : DATED 12/12/90

SCENARIO "DM91570C" : DATED 12/14/90

A.G.A.-TERA 1991 BASE CASE : 12/14/90

ONSHORE WELL COMPLETIONS

YEAR	EXPLORATION WELLS				DEVELOPMENT WELLS				TOTAL WELLS			
	GAS	OIL	DRY	TOTAL	GAS	OIL	DRY	TOTAL	GAS	OIL	DRY	TOTAL
1990	610	590	3,505	4,705	9,840	9,960	4,860	24,660	10,450	10,550	8,365	29,365
1995	630	548	3,336	4,514	13,759	11,024	5,760	30,543	14,389	11,572	9,096	35,057
2000	916	683	4,227	5,826	15,864	11,085	6,000	32,949	16,780	11,768	10,227	38,775
2005	974	762	4,105	5,841	20,023	10,755	6,481	37,259	20,997	11,517	10,586	43,100
2010	952	712	3,546	5,210	23,820	10,005	6,768	40,593	24,772	10,717	10,314	45,803

SOURCES

SCENARIO "ON91570Q" : DATED 12/12/90

A.G.A.-TERA 1991 BASE CASE : 12/14/90

OFFSHORE WELL COMPLETIONS

YEAR	EXPLORATION WELLS				DEVELOPMENT WELLS				TOTAL WELLS			
	GAS	OIL	DRY	TOTAL	GAS	OIL	DRY	TOTAL	GAS	OIL	DRY	TOTAL
1990	8	1	94	103	76	53	70	199	85	55	164	303
1995	6	1	66	73	79	44	61	183	85	44	127	256
2000	6	1	58	65	62	30	44	136	69	31	101	201
2005	5	1	40	46	57	21	34	112	62	22	75	158
2010	4	0	26	29	50	14	26	90	53	15	52	119

SOURCES

SPREADSHEET "OFSHONSH.WQ1" : DATED 10/10/90 & "OFSONS01.WQ1" : DATED 12/05/90

SCENARIO "ON91570Q" : DATED 12/12/90

A.G.A.-TERA 1991 BASE CASE : 12/14/90

TOTAL WELL COMPLETIONS

EXPLORATION WELLS					DEVELOPMENT WELLS				TOTAL WELLS			
YEAR	GAS	OIL	DRY	TOTAL	GAS	OIL	DRY	TOTAL	GAS	OIL	DRY	TOTAL
1990	618	591	3,599	4,808	9,916	10,013	4,930	24,859	10,535	10,605	8,529	29,668
1995	636	549	3,402	4,587	13,838	11,068	5,821	30,726	14,474	11,616	9,223	35,313
2000	922	684	4,285	5,891	15,926	11,115	6,044	33,085	16,849	11,799	10,328	38,976
2005	979	763	4,145	5,887	20,080	10,776	6,515	37,371	21,059	11,539	10,661	43,258
2010	956	712	3,572	5,239	23,870	10,019	6,794	40,683	24,825	10,732	10,366	45,922

SOURCES

SCENARIO "ON91570Q" : DATED 12/12/90

SPREADSHEET "OFSHONSH.WQ1" : DATED 10/10/90 & "OFSONS01.WQ1" : DATED 12/05/90

A.G.A.-TERA 1991 BASE CASE : 12/14/90

ONSHORE NATURAL GAS RESERVE ADDITIONS

YEAR	DISCOVERIES (DRY)			EXTNSNS & RVSNS (DRY)			TOTAL (DRY)		
	ASSOC (BCF)	NON-ASC (BCF)	TOTAL (BCF)	ASSOC (BCF)	NON-ASC (BCF)	TOTAL (BCF)	ASSOC (BCF)	NON-ASC (BCF)	TOTAL (BCF)
1990	71	1,184	1,255	996	12,861	13,857	1,067	14,045	15,112
1995	63	1,100	1,163	1,053	13,383	14,436	1,116	14,483	15,599
2000	74	1,424	1,498	945	13,905	14,850	1,019	15,329	16,348
2005	70	1,403	1,473	757	16,277	17,034	827	17,680	18,507
2010	58	1,252	1,310	608	17,626	18,234	666	18,878	19,544

SOURCES

SCENARIO "ON91570Q" : DATED 12/12/90

A.G.A.-TERA 1991 BASE CASE : 12/14/90

OFFSHORE NATURAL GAS RESERVE ADDITIONS

YEAR	DISCOVERIES (DRY)			EXTNSNS & RVSNS (DRY)			TOTAL (DRY)		
	ASSOC (BCF)	NON-ASC (BCF)	TOTAL (BCF)	ASSOC (BCF)	NON-ASC (BCF)	TOTAL (BCF)	ASSOC (BCF)	NON-ASC (BCF)	TOTAL (BCF)
1990	63	897	960	330	2,245	2,575	393	3,142	3,535
1995	52	774	827	324	2,172	2,496	376	2,946	3,322
2000	54	880	934	255	1,981	2,237	309	2,862	3,171
2005	48	824	872	194	2,203	2,398	243	3,027	3,270
2010	38	698	735	148	2,263	2,411	186	2,961	3,147

SOURCES

SPREADSHEET "OFSHONSH.WQ1" : DATED 10/10/90 & "OFSONS01.WQ1" : DATED 12/05/90
SCENARIO "ON91570Q" : DATED 12/12/90

A.G.A.-TERA 1991 BASE CASE : 12/14/90

TOTAL NATURAL GAS RESERVE ADDITIONS

YEAR	DISCOVERIES (DRY)			EXTNSNS & RVSNS (DRY)			TOTAL (DRY)		
	ASSOC (BCF)	NON-ASC (BCF)	TOTAL (BCF)	ASSOC (BCF)	NON-ASC (BCF)	TOTAL (BCF)	ASSOC (BCF)	NON-ASC (BCF)	TOTAL (BCF)
1990	134	2,081	2,215	1,326	15,106	16,432	1,460	17,187	18,647
1995	115	1,874	1,990	1,377	15,555	16,932	1,492	17,429	18,921
2000	128	2,304	2,432	1,200	15,886	17,087	1,328	18,191	19,519
2005	118	2,227	2,345	951	18,480	19,432	1,070	20,707	21,777
2010	96	1,950	2,045	756	19,889	20,645	852	21,839	22,691

SOURCES

SCENARIO "ON91570Q" : DATED 12/12/90

SPREADSHEET "OFSHONSH.WQ1" : DATED 10/10/90 & "OFSONS01.WQ1" : DATED 12/05/90

A.G.A.-TERA 1991 BASE CASE : 12/14/90

NATURAL GAS SUPPLIES TAKEN

BCF
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YEAR	DOMESTIC NTRL GAS		IMPORTED NATURAL GAS			COAL	MISCEL-	TOTAL
	LOWER-48	ALASKAN	CANADIAN	MEXICAN	LNG	GASIFI-	LANEOUS	
	(BCF)	(BCF)	(BCF)	(BCF)	(BCF)	CATION	OTHER	(BCF)
1990	16,460	350	1,300	0	60	50	60	18,280
1995	18,868	350	1,600	0	210	0	50	21,078
2000	20,227	350	1,800	0	410	0	50	22,837
2005	20,176	1,150	1,800	0	510	0	50	23,686
2010	20,821	1,150	1,800	0	610	0	50	24,431

SOURCES

SCENARIO "DM91570C" : DATED 12/14/90

A.G.A.-TERA 1991 BASE CASE : 12/14/90

NATURAL GAS SUPPLIES TAKEN

TB TU

YEAR	DOMESTIC NTRL GAS		IMPORTED NATURAL GAS			COAL	MISCEL-	TOTAL
	LOWER-48 (TBTU)	ALASKAN (TBTU)	CANADIAN (TBTU)	MEXICAN (TBTU)	LNG (TBTU)	GASIFI- CATION (TBTU)	LANEOUS OTHER (TBTU)	
1990	17,008	350	1,300	0	60	50	60	18,828
1995	19,500	350	1,600	0	210	0	50	21,710
2000	20,912	350	1,800	0	410	0	50	23,522
2005	20,887	1,150	1,800	0	510	0	50	24,397
2010	21,554	1,150	1,800	0	610	0	50	25,164

SOURCES

SCENARIO "DM91570C" : DATED 12/14/90

A.G.A.-TERA 1991 BASE CASE : 12/14/90

NATURAL GAS CONSUMPTION

YEAR	RESIDENTIAL (TBTU)	COMMERCIAL (TBTU)	INDUSTRIAL (TBTU)	ELECTRIC UTILITY (TBTU)	VEHICLES (TBTU)	T&D FUEL (TBTU)	TOTAL (TBTU)
1990	4,654	2,924	8,037	2,675	0	538	18,828
1995	4,954	3,349	8,826	3,852	148	581	21,710
2000	5,129	3,628	9,412	4,375	382	596	23,522
2005	5,261	3,730	9,448	4,648	709	601	24,397
2010	5,395	3,773	9,371	4,848	1,177	600	25,164

SOURCES

SCENARIO "DM91570C" : DATED 12/14/90

A.G.A.-TERA 1991 BASE CASE : 12/14/90

PRIMARY ENERGY CONSUMPTION

YEAR	NATURAL GAS	OIL	COAL	NUCLEAR	HYDRO- ELECTRIC	MISCEL- ANEOUS	TOTAL	NATURAL GAS	OIL	COAL	NUCLEAR	HYDRO- ELECTRIC	MISCEL- ANEOUS	TOTAL
	(TBTU)	(TBTU)	(TBTU)	(TBTU)	(TBTU)	(TBTU)	(TBTU)	(PRCNT) (OF TTL)	(PRCNT) (OF TTL)	(PRCNT) (OF TTL)	(PRCNT) (OF TTL)	(PRCNT) (OF TTL)	(PRCNT) (OF TTL)	(PRCNT) (OF TTL)
1990	18,828	33,086	18,841	6,845	2,826	871	81,297	23.2%	40.7%	23.2%	8.4%	3.5%	1.1%	100.0%
1995	21,710	32,114	18,708	6,800	3,571	1,470	84,373	25.7%	38.1%	22.2%	8.1%	4.2%	1.7%	100.0%
2000	23,522	33,007	19,815	6,754	3,715	2,076	88,889	26.5%	37.1%	22.3%	7.6%	4.2%	2.3%	100.0%
2005	24,397	33,084	21,754	6,280	3,826	2,524	91,865	26.6%	36.0%	23.7%	6.8%	4.2%	2.7%	100.0%
2010	25,164	33,321	23,487	5,705	3,915	2,899	94,491	26.6%	35.3%	24.9%	6.0%	4.1%	3.1%	100.0%

SOURCES

SCENARIO "DM91570C" : DATED 12/14/90

A.G.A.-TERA 1991 BASE CASE : 12/14/90

RESIDENTIAL ENERGY PRICES

YEAR	NOMINAL \$						5-YEAR AVERAGE GROWTH RATE			AVERAGE GROWTH RATE SINCE 1990				RATIO OF ELCTRCTY TO ALTERNATIVE					
	NTRL	GAS	DSTL	OIL	ELCTRCTY	NTRL	GAS	DSTL	OIL	ELCTRCTY	NTRL	GAS	DSTL	OIL	ELCTRCTY	NTRL	GAS	DSTL	OIL
(\$/MMBTU)	(\$/MMBTU)	(\$/MMBTU)	(\$/MMBTU)	(\$/MMBTU)	(\$/MMBTU)	(\$/MMBTU)	(\$/MMBTU)	(\$/MMBTU)	(\$/MMBTU)	(\$/MMBTU)	(PRCNT)	(PRCNT)	(PRCNT)	(PRCNT)	(PRCNT)	(PRCNT)	(PRCNT)	(PRCNT)	(PRCNT)
1990	5.76	7.90	22.80	5.76	7.90	22.80	0.2%	-0.5%	-0.8%	0.2%	-0.5%	-0.8%	395.8%	288.6%					
1995	7.23	9.57	27.18	5.83	7.71	21.90	1.1%	0.5%	0.4%	0.7%	0.0%	-0.2%	375.6%	284.0%					
2000	9.39	12.04	33.98	6.16	7.91	22.31	2.0%	3.7%	1.4%	1.1%	1.2%	0.3%	362.2%	282.0%					
2005	13.01	18.13	45.68	6.81	9.49	23.92	2.1%	2.8%	2.3%	1.4%	1.6%	0.8%	351.2%	252.1%					
2010	18.12	26.10	64.04	7.56	10.90	26.74							353.7%	245.3%					

SOURCES

SCENARIO "DM91570C" : DATED 12/14/90

A.G.A.-TERA 1991 BASE CASE : 12/14/90

INDUSTRIAL ENERGY PRICES

YEAR	NOMINAL \$						5-YEAR AVERAGE GROWTH RATE			AVERAGE GROWTH RATE SINCE 1990				RATIO OF ELCTRCTY TO ALTERNATIVE			
	NTRL (\$/MMBTU)	GAS (\$/MMBTU)	RSDL (\$/MMBTU)	OIL (\$/MMBTU)	ELCTRCTY (\$/MMBTU)	NTRL (\$/MMBTU)	GAS (\$/MMBTU)	RSDL (\$/MMBTU)	OIL (\$/MMBTU)	ELCTRCTY (PER YR)	NTRL (PER YR)	GAS (PER YR)	RSDL (PER YR)	OIL (PER YR)	ELCTRCTY (PER YR)	NTRL (PRCNT)	GAS (PRCNT)
1990	2.90	3.23	14.82	2.90	3.23	14.82										511.0%	458.8%
1995	3.81	3.83	17.10	3.07	3.08	13.77	1.1%	-0.9%	-1.5%	1.1%	-0.9%	-1.5%	448.5%			447.1%	
2000	5.20	4.89	21.29	3.42	3.21	13.98	2.2%	0.8%	0.3%	1.7%	-0.1%	-0.6%	408.8%			435.5%	
2005	7.79	8.49	28.41	4.08	4.44	14.87	3.6%	6.7%	1.2%	2.3%	2.1%	0.0%	364.5%			334.9%	
2010	11.60	13.26	39.48	4.84	5.54	16.48	3.5%	4.5%	2.1%	2.6%	2.7%	0.5%	340.5%			297.5%	

SOURCES

SCENARIO "DM91570C" : DATED 12/14/90

A.G.A.-TERA 1991 BASE CASE : 12/14/90

ECONOMIC INDICATORS

YEAR	1991 BASE CASE		ANNUAL GROWTH RATE		5-YR AVERAGE GROWTH RATE		AVG GROWTH RATE SINCE 1990	
	GNP (10^9) (1982 \$)	GNP DEFLATOR (82=100)	GNP (PRCNT) (PER YR)	GNP DFLT (PRCNT) (PER YR)	GNP (PRCNT) (PER YR)	GNP DFLT (PRCNT) (PER YR)	GNP (PRCNT) (PER YR)	GNP DFLT (PRCNT) (PER YR)
1990	4,220	134	0.7	5.2				
1995	4,715	166	2.9	4.1	2.2%	4.4%	2.2%	4.4%
2000	5,378	204	2.6	4.3	2.7%	4.2%	2.5%	4.3%
2005	5,994	255	2.2	4.6	2.2%	4.6%	2.4%	4.4%
2010	6,677	320	2.2	4.6	2.2%	4.6%	2.3%	4.4%

SOURCES

SCENARIO "DM91570C" : DATED 12/14/90

A.G.A.-TERA 1991 BASE CASE : 12/14/90

COMPARISON OF WELLHEAD PRICES TO THE 1989 MID-YEAR BASE CASE

YEAR	1991 BASE CASE (1990 \$)		1989 MID-YEAR BASE CASE (1989 \$)		1989 MID-YEAR BASE CASE (1990 \$)		COMPARISON OF 1991 BASE CASE TO 89 MD-YR BS CS	
	OIL (\$/BL)	NTRL GAS (\$/MCF)	OIL (\$/BL)	NTRL GAS (\$/MCF)	OIL (\$/BL)	NTRL GAS (\$/MCF)	OIL (91/89)	NTRL GAS (91/89)
1990	25.00	1.75	17.11	1.87	17.88	1.95	139.8%	89.6%
1995	22.92	1.80	20.94	2.25	21.88	2.35	104.8%	76.6%
2000	22.89	2.11	25.64	2.96	26.79	3.09	85.4%	68.2%
2005	30.88	2.71	34.63	3.89	36.18	4.06	85.4%	66.7%
2010	37.91	3.48	46.75	5.13	48.85	5.36	77.6%	65.0%

SOURCES

SCENARIO "DM91570C" : DATED 12/14/90

SCENARIO "DM892061" : DATED 08/16/89

A.G.A.-TERA 1991 BASE CASE : 12/14/90

COMPARISON OF NATURAL GAS CONSUMPTION TO THE 1989 MID-YEAR BASE CASE

1991 BASE CASE								1989 MID-YEAR BASE CASE						
YEAR	RESIDEN-	COMMERC-	INDUS-	ELECTRIC		T&D	TOTAL	RESIDEN-	COMMERC-	INDUS-	ELECTRIC		T&D	TOTAL
	TIAL	IAL	TRIAL	UTILITY	VEHICLES	FUEL		TIAL	IAL	TRIAL	UTILITY	VEHICLES	FUEL	
	(TBTU)	(TBTU)	(TBTU)	(TBTU)	(TBTU)	(TBTU)	(TBTU)	(TBTU)	(TBTU)	(TBTU)	(TBTU)	(TBTU)	(TBTU)	(TBTU)
1990	4,654	2,924	8,037	2,675	0	538	18,828	4,707	2,948	8,268	3,120	0	494	19,537
1995	4,954	3,349	8,826	3,852	148	581	21,710	4,879	3,317	8,930	3,663	0	511	21,300
2000	5,129	3,628	9,412	4,375	382	596	23,522	4,995	3,595	9,164	3,892	0	511	22,157
2005	5,261	3,730	9,448	4,648	709	601	24,397	5,078	3,754	9,082	4,194	0	508	22,616
2010	5,395	3,773	9,371	4,848	1,177	600	25,164	5,141	3,888	9,036	4,519	0	504	23,088

SOURCES

SCENARIO "DM91570C" : DATED 12/14/90

SCENARIO "DM892061" : DATED 08/16/89

A.G.A.-TERA 1991 BASE CASE : 12/14/90

COMPARISON OF NATURAL GAS CONSUMPTION TO THE 1989 MID-YR BS CS

COMPARISON OF 1991 BASE CASE TO 1989 MID-YEAR BASE CASE

RESIDEN- TIAL (91/89)	COMMERC- IAL (91/89)	INDUS- TRIAL (91/89)	ELECTRIC UTILITY (91/89)	VEHICLES (91/89)	T&D FUEL (91/89)	TOTAL (91/89)
98.9%	99.2%	97.2%	85.7%	ERR	108.9%	96.4%
101.5%	101.0%	98.8%	105.2%	ERR	113.7%	101.9%
102.7%	100.9%	102.7%	112.4%	ERR	116.6%	106.2%
103.6%	99.4%	104.0%	110.8%	ERR	118.3%	107.9%
104.9%	97.0%	103.7%	107.3%	ERR	119.0%	109.0%

A.G.A.-TERA 1991 BASE CASE : 12/14/90

COMPARISON OF ECONOMIC INDICATORS TO THE 1989 MID-YEAR BASE CASE

YEAR	1991 BASE CASE				1989 MID-YEAR BASE CASE				COMPARISON OF 1991 CASE TO 1989 MID-YR CASE			
	GNP	GNP	GROWTH	INFLTN	GNP	GNP	GROWTH	INFLTN	GNP	GNP DFLT	GROWTH	INFLTN
	(10^9)	DEFLATOR	(PRCNT)	(PRCNT)	(10^9)	DEFLATOR	(PRCNT)	(PRCNT)				
	(1982 \$)	(82=100)	(PER YR)	(PER YR)	(1982 \$)	(82=100)	(PER YR)	(PER YR)			(91/89)	(91/89)
1990	4,220	134	0.7	5.2	4,200	133	1.9	4.5	100.5%	100.8%	36.3%	115.8%
1995	4,715	166	2.9	4.1	4,807	164	2.7	4.3	98.1%	101.2%	105.5%	95.8%
2000	5,378	204	2.6	4.3	5,432	202	2.5	4.3	99.0%	101.0%	104.8%	98.8%
2005	5,994	255	2.2	4.6	6,055	257	2.2	4.9	99.0%	99.2%	100.0%	94.5%
2010	6,677	320	2.2	4.6	6,747	327	2.2	4.9	99.0%	97.9%	99.5%	94.7%

SOURCES

SCENARIO "DM91570C" : DATED 12/14/90

SCENARIO "DM89206I" : DATED 08/16/89

Planning & Analysis Issues

ISSUE BRIEF 1991-4

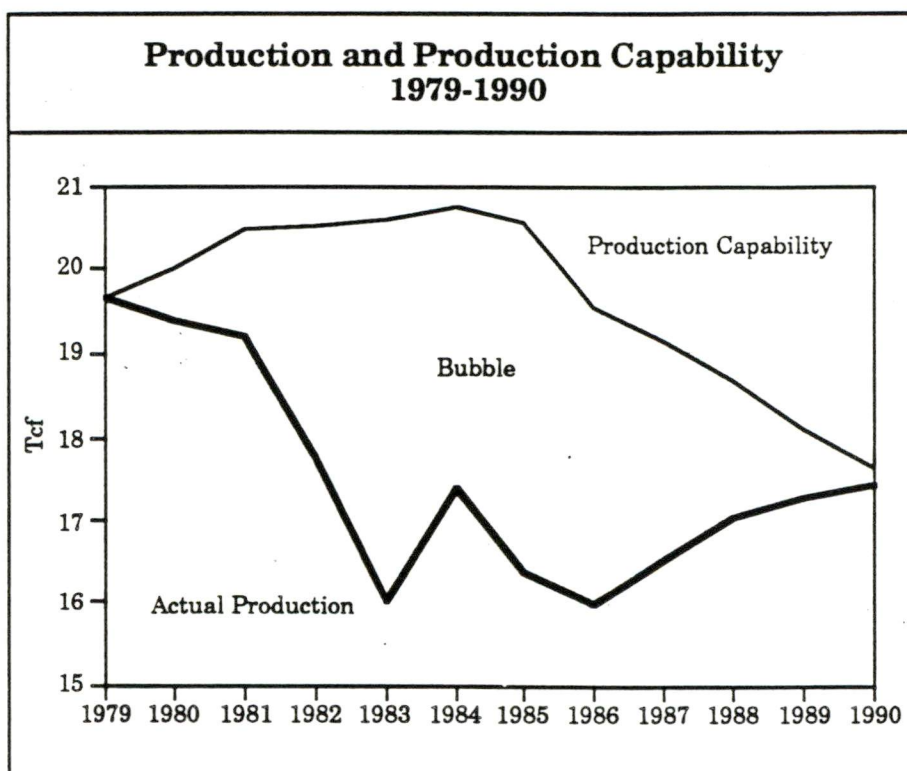
JANUARY 18, 1991

CURRENT NATURAL GAS PRODUCTION CAPABILITY

In Brief

The excess natural gas production capability (the gas "bubble") that has characterized the natural gas market since 1980 has for practical purposes disappeared. The natural gas market during a cold winter heating season is using all of the available production and supplementing those volumes with natural gas from storage and imports. On an annualized basis (see Figure 1) some excess supplies still exist but these excesses occur in the warmer months of the year. This highly seasonal demand in contrast to a more constant natural gas production profile will continue to create excess supplies in warm weather and a balanced supply and demand during cold weather.

Figure 1



NOTE: Throughout this study, gas volumes (i.e., Tcf, Bcf, etc.) are used in lieu of energy values in Btu (i.e., quadrillion Btu or trillion Btu). The conversion factor employed is taken from the EIA Monthly Energy Review of July 1990. This conversion factor is 1,031 Btu per cubic foot of natural gas.

Past studies of the annualized natural gas production capabilities did not stress the seasonal factors. Included in this study is a monthly regional deliverability study that has been included in this analysis to assess the reasonableness of estimated declines in production capability. This part of the evaluation of deliverability is based on 1980 production compared to recently demonstrated peak production levels.

Two factors caused the bubble to decline since the mid-1980s: (1) higher gas demand due primarily to lower natural gas prices; and (2) declining domestic production capability due to reduced drilling (the result of low energy prices and shut-in gas production). Today, the gas bubble has effectively disappeared during the winter heating season and not surprisingly drilling activity has already begun to increase. This increase in gas prone drilling will likely accelerate and reverse the decline in production capability. This analysis assumes that takes of Canadian gas supplies, that were about 1.3 Tcf in 1989, will continue to rise slightly in 1990. Both the Canadian imports and the recently reinstituted LNG imports soften the impact of seasonal demand surges now that supply and demand are nearly equal.

Introduction

This analysis estimates the unused production capability for each year from 1980 through 1990 using the most recent statistics available. This assessment of the domestic unused production capability updates the earlier work and takes into account the variations in domestic production (due to lack of requirements) since 1979. The decline in the estimates for unused production capability is based on generally increasing gas requirements and production from 1986 to 1990.

This analysis does not include in its "bubble" estimates either the large amounts of gas (34.2 Tcf¹ of nonproducing proved reserves) that are not connected to the pipeline system (and thus not presently available to markets) or contracted for but untaken Canadian gas supplies. If gas demand were to grow more rapidly than anticipated, these additional sources of gas could be quickly brought to the market. An earlier study, A.G.A. Energy Analysis 1989-8², examines these and other potential short-term supplies.

Reduced consumption of natural gas from the 1975-81 average of 19.6 Tcf per year, coupled with nearly constant domestic gas delivery capability from 1980-1986, led to the "gas bubble." Several past analyses have evaluated the size of this "bubble." In this study the estimate of the "bubble" size is updated -- that estimate reflects both demand growth and an increased level of drilling -- that together contribute to the continued decline in the size of the bubble.

Natural gas production was 19,663 Bcf in 1979 and declined significantly in the 1980s to a low point of 15,991 Bcf in 1986. An annual production level of over 17.0 Tcf or more is anticipated for 1990. In 1990, the levels of gas requirements equal the sum of Canadian imports, supplemental gas supplies and domestic gas production. Economic conditions, the pricing practices of competitive energy sources, particularly oil products, weather and conservation each play a part in establishing the level of gas requirements.

Methodology

The methodology used in this analysis is based on the extrapolation of individual gas well production trends. With this technique, total U.S. non-associated gas production and the number of producing gas wells in a given year are used to calculate an average production

Table 1
PRODUCTION PER GAS WELL

Year	Total Gas Production in Bcf	Non-Associated Gas Production in Bcf ¹	Ratio of Non-Associated Gas Produced to Total Gas Production ²	Producing Gas Wells	Annual Non-Associated Gas Production per Gas Well MMcf
1975	19,236	15,389	.800	130,364	118.0
1976	19,098	15,259	.799	137,542	110.9
1977	19,163	15,560	.812	147,658	105.4
1978	19,122	15,737	.823	157,454	99.9
1979	19,663	16,320	.830	169,891	96.1
1980	19,403	16,007	.825	182,004	87.9
1981	19,181	15,920	.830	198,839	80.1
1982	17,758	14,597	.822	210,753	69.3
1983	16,033	12,794	.798	221,952	57.6
1984	17,392	14,001	.805	233,853	59.9
1985	16,382	13,007	.794	243,344	53.5
1986	15,991	12,633	.790	241,527	52.3
1987	16,536	13,262	.802	249,225	53.2
1988	17,026	13,910	.817	257,279	54.1
1989	17,260	14,240	.825	262,483	54.3
1990	17,413	14,366	.825	267,000 ³	53.8

¹Based on the total gas production estimates as shown in Column Two.

²The ratio of non-associated gas production to total gas production has generally declined during the period of low demand. With the depletion of the bubble and less gas well production shut-in, the ratio has returned to previously established levels.

³This estimate depends on the number of gas wells completed and abandoned each year. Because of improved market conditions, the number of producing gas wells is estimated to increase by approximately 4,500 wells in 1990.

Sources: A.G.A. Reserves of Crude Oil, Natural Gas Liquids and Natural Gas in the United States and Canada as of December 31, 1979; EIA, Monthly Energy Review; EIA, U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves; EIA, Natural Gas Annual 1990.

NOTE: Throughout the production section of this study, gas volumes (i.e., Tcf, Bcf, etc.) are used in lieu of energy values in Btu (i.e., quadrillion Btu or trillion Btu). The conversion factor employed is taken from the EIA Monthly Energy Review of July 1990. This conversion factor is 1,031 Btu per cubic foot of natural gas.

volume per gas well. This value is compared to the estimate of gas well production capability, which is the result of extrapolation of 1977-1979 production trends that show a decline in production per gas well of about 5 percent per year. This period was chosen because it reflects production per well statistics when there was no significant unused production capability. (The 1980-1989 data reflect variations in production per gas well that were caused in large part by reduced demand.)

An estimate of domestic production capability is dependent upon the total wells drilled, gas well completions and gas wells abandoned. Producing gas well estimates for 1990 were based on an estimated annual rig count of about 1,000. The gradual increase in producing gas wells is compatible with gas well completion increases from 7,880 in 1988, to 9,400 in 1989 and probably about 11,000 by 1990.

The production capability per well, when multiplied by the number of producing wells, yields an estimate of total non-associated gas production capability between 1979-90. Estimates of associated-dissolved gas production (from oil wells) are based on recent production data as reported by EIA and are projected on the basis of the percentages of total production that is associated-dissolved gas. These data are adjusted from reported EIA statistics because EIA reports wet natural gas volumes (i.e., including liquids). In this study, the sum of the non-associated gas production and the associated-dissolved production is made equal to the total dry production as reported by EIA for years through 1989. For 1990, the projection of production capability is estimated as the sum of non-associated gas production capability and of associated-dissolved production implied by the monthly total production estimates which are available.

Table 1 provides the statistical data necessary to develop historical estimates of non-associated gas production per well through 1989. Estimates of production 1990 are based on available EIA statistical data through July 1990.

The historical non-associated gas production in Table 1 has been derived from the EIA annual reserves reports and the EIA **Monthly Energy Review**. The reserves reports are used to obtain ratios of non-associated gas production to total gas production. Producing gas well data are taken from published **Natural Gas Annual 1989** statistics.

Table 2 shows estimates of the non-associated gas production capability per well, the number of producing gas wells, the non-associated production capability and the associated-dissolved gas production. The difference between the capability to produce and actual production is the basis of the calculation of the unused production capability as shown in Table 3.

Maximum Production Capability

The estimates developed here are intended to evaluate what production levels might be achieved with wells already drilled and attached to pipelines. Some additional capacity also exists in wells that are capable of gas production but have not been completed or are not connected to a pipeline. In addition, there are large volumes of gas behind the pipe³ (gas not being produced because production from that well is presently coming from other depths) that are excluded from production capability. In both situations, these volumes of gas represent currently unavailable sources of gas capability that are not utilized.

These estimates include only gas that comes from reservoirs currently capable of producing and connected to pipelines. A larger volume could be produced under different operating

conditions.

Annualized Results

This methodology shows that the unused production capability increased significantly in the early 1980s. (See Table 3 below.) The unused capability rose rapidly to a peak level in 1983 of 4.6 Tcf and then started to decline. This decline was somewhat uneven given the sharp drops in domestic requirements in 1985, 1986 and 1987. The decline in unused production capability is primarily due to reduced drilling activity coupled with increased demand. The declining production per gas well since 1979 was counterbalanced by the increasing number of producing gas wells through 1985 and, as a result, these factors were in equilibrium and production capability remained nearly constant at just over 20 Tcf. The decline in gas well completions (resulting from the low rig count levels) reduced the rate of growth in the number of producing gas wells after 1985. The decline in production per gas well is a major factor in the 1988-1990 time period so that the total productive capacity declines from 20,558 Bcf in 1985 to a low level of about 17,636 Bcf in 1990. This in turn contributes to a decline in the "bubble size" from the 4.2 Tcf of 1985 to less than one Tcf in 1990.

Table 2
ESTIMATES OF PRODUCTION CAPABILITY 1979-1990

Year	Non-Associated Production Capability per Gas Well ¹	Number of Producing Gas Wells	Non-Associated Production Capability in Bcf	Associated-Dissolved Production in Bcf ²
1979	96.06 MMCF	169,891	16,320	3,343
1980	91.26 MMCF	182,004	16,610	3,396
1981	86.69 MMCF	198,839	17,237	3,261
1982	82.36 MMCF	210,753	17,358	3,161
1983	78.24 MMCF	221,952	17,366	3,239
1984	74.33 MMCF	233,853	17,382	3,391
1985	70.61 MMCF	243,344	17,183	3,375
1986	67.08 MMCF	241,527	16,202	3,358
1987	63.73 MMCF	249,225	15,883	3,274
1988	60.54 MMCF	257,279	15,576	3,116
1989	57.51 MMCF	262,483	15,095	3,020
1990	54.64 MMCF	267,000	14,589	3,047

¹The 1980-1990 estimates are based on a 5 percent per year decline from the production capability demonstrated in 1979 (when there was little or no unused production).

²These values are the implied associated-dissolved production based on data in Table 1.

NOTE: Throughout the production section of this study, gas volumes (i.e., Tcf, Bcf, etc.) are used in lieu of energy values in Btu (i.e., quadrillion Btu or trillion Btu). The conversion factor employed is taken from the EIA Monthly Energy Review of July 1990. This conversion factor is 1,031 Btu per cubic foot of natural gas.

Drilling Implications

The implications of these results in regard to drilling more gas wells are critical. In 1989, the difficulty of selling new production into the over-supplied market as well as a soft, volatile spot market still existed. As a result, the major oil companies and independent producers only marginally increased their exploration and production budgets.

In 1990, drilling activity has increased so that the decline in production capability is moderating. The projected annualized "bubble" is close to zero for the coming winter heating season and should not be a major deterrent to the development of new gas resources. After 1990, the winter heating season demand and potential growth in the off-season markets due to the Clean Air Act will allow production to be more easily marketed and, as a result, even greater increases in gas well drilling may be anticipated.

Table 3
PRODUCTION AND PRODUCTION CAPABILITY¹

1979-1990
(in Bcf)

Year	Actual Production ²	Production Capability ³	Unused Production Capability
1979	19,663	19,663	0
1980	19,403	20,006	603
1981	19,181	20,498	1,317
1982	17,758	20,519	2,761
1983	16,033	20,605	4,572
1984	17,392	20,773	3,381
1985	16,382	20,558	4,176
1986	15,991	19,560	3,569
1987	16,536	19,157	2,621
1988	17,026	18,692	1,666
1989	17,260	18,115	855
1990	17,413	17,636	223

¹Expanded from non-associated production capability using extrapolations of ratios established in Table 1 sources.

²EIA Monthly Energy Review, July 1990.

³This estimate is the sum of the non-associated production capability and the associated-dissolved production from Table 2.

NOTE 1: This methodology assumes that prior to 1980 there was no unused production capability.

NOTE 2: Throughout the production section of this study, gas volumes (i.e., Tcf, Bcf, etc.) are used in lieu of energy values in Btu (i.e., quadrillion Btu or trillion Btu). The conversion factor employed is taken from the EIA Monthly Energy Review of July 1990. This conversion factor is 1,031 Btu per cubic foot of natural gas.

Sensitivity of Results

The results of this analysis are generally consistent with the earlier analyses reported in the **Gas Energy Review** ("1985 Outlook", "1986 Outlook", July 1986, "1987 Outlook", July 1987, "1988 Outlook", July 1988, and "1989 Outlook", July 1989, "1990 Outlook"). These estimates for 1990 are, of course, extremely sensitive to the annual statistics for 1990. In this study, A.G.A. has estimated year-end totals when data for only seven or eight months were available. These extrapolations are generally consistent with A.G.A.'s Total Energy Resource Analyses and other recent A.G.A. publications.

Monthly National Production Capability.

The methodology outlined above indicates that the projected total production capability through 1990 has decreased about two Tcf since 1979. Decreasing production per gas well was generally offset by the increase in the number of producing gas wells. This finding is controversial because claims have been made of major losses in national production capability.⁴ These two points of view can be examined by looking at what production has actually been in recent years, as shown in Table 4.

Table 4 is a tabulation of the daily production rates for the month of maximum production for six major gas producing states and the total United States. The final six columns of the table show the ratios of the production in each state for 1985, 1986, 1987, 1988, 1989 and the early months of 1990, compared with 1980. The general conclusion is that while production levels are typically lower in the later years, the capacity to produce gas nationally has been demonstrated at 89-92 percent of the 1980 level. At worst, a decline of eight to eleven percent might be indicated. At best, there has been no loss in production capability at all.

In 1984, many Texas wells experienced damage due to freezing weather (similar to the December 1989 freezing of wells in the Gulf of Mexico) that severely limited production at that time. Subsequently, there has been extensive speculation that the Texas gas production capability could be significantly lower than it was in 1980.⁴ Table 4 statistics on Texas production indicate that as recently as early in 1990, the Texas production level was demonstrated at 91.3 percent of the maximum production level achieved in any year since 1980.

A number of other deliverability studies are in progress and some has been completed. DOE, FERC, NPC and NGSA⁵ have each done some work in this area. Interestingly, the methodologies employed are radically different so that the diverse sources of data should establish a high level of confidence if the results are similar.

Annualized Short Term Gas Supplies

This study does not reflect the full deliverability from other gas supplies. The alternative sources of gas are discussed in Energy Analysis 89-8, titled "Short-Term Gas Supply Potential -1989 Update." These sources, as shown in Table 5, include gas from uncommitted nonproducing gas reserves, additional Canadian gas, accelerated infill drilling and imports of liquefied natural gas. Energy Analysis 89-8 demonstrates a potential to market an additional 1,400 Bcf within twelve months and as much as 2,100 Bcf by 1993 if needed. Some of this capability is already in use (especially Canadian gas), and some is increasing rapidly (LNG).

Table 4

DEMONSTRATED NATURAL GAS PRODUCTION IN PEAK MONTHS

State	Daily Production Demonstrated in Peak Month*									Ratios					
	1980	1983	1984	1985	1986	1987	1988	1989	1990 ¹	<u>1985</u> 1980	<u>1986</u> 1980	<u>1987</u> 1980	<u>1988</u> 1980	<u>1989</u> 1980	<u>1990</u> 1980
KS	3,270	2,057	1,967	2,194	1,903	1,929	2,342	2,162	1,850	.671	.582	.590	.716	.661	.566
LA	20,446	15,928	18,535	16,537	15,814	15,112	15,347	15,415	15,627	.809	.773	.739	.751	.754	.764
NM	3,339	2,972	3,061	3,148	2,420	2,804	2,757	2,708	2,835	.943	.725	.840	.826	.811	.849
OK	6,444	5,608	6,182	6,246	5,846	5,932	5,992	6,338	6,019	.969	.907	.921	.930	.984	.934
TX	20,143	17,483	18,482	18,284	18,036	18,382	18,562	17,613	18,394	.908	.895	.913	.922	.874	.913
WY	1,308	1,509	1,588	1,356	1,502	1,690	1,616	2,095	2,030	1.037	1.148	1.292	1.235	1.602	1.552
U.S.	59,061	51,763	55,881	53,054	52,077	51,862	53,348	52,735	54,049	.898	.882	.878	.903	.893	.915

*in MMcf

1. January-May only.

Source: EIA, Natural Gas Monthly, July 1990.

NOTE: Throughout this study, gas volumes (i.e., Tcf, Bcf, etc.) are used in lieu of energy values in Btu (i.e., quadrillion Btu or trillion Btu). The conversion factor employed is taken from the EIA Monthly Energy Review of July 1990. This conversion factor is 1,031 Btu per cubic foot of natural gas.

Supply-Demand Balance

The emerging natural gas market is highly price sensitive and competitive. Today, gas production clears the market by the mechanism of price adjustments in the spot market. As a result, major swings in spot market prices have been observed. These

Table 5
Possible Incremental Short Term Gas Supply Potential
(in Bcf)

	<u>Within 12 Months</u>	<u>Within Three Years</u>
Nonproducing Reserves	250-750	500-1,000
Canadian Gas ¹	400	500
Accelerated Infill Drilling	50-100	100-400
LNG ²	40-100	200
Total Additional Supply Available	700-1,350	1,300-2,100

¹Volumes are in addition to the 1,400 Bcf estimated to be imported in 1990.

²Volumes are well below the physical limitations of the existing terminals.

price variations have so far been more characteristic of selling the available gas rather than customers bidding for limited gas supplies. However, during future winter heating seasons, significant spot market price volatility should be expected.⁶ The ability of price variations to allocate gas supplies so as to permit high priority customers who require service to gain access to adequate supplies has been demonstrated only once (December 1989) during a severely cold winter. Nevertheless, these price fluctuations are likely to cause interruptible and dual-fuel capable customers to switch to less expensive fuels when severe weather causes sharp increases in gas demand. As a result, a relatively long period of supply-demand balance is considered possible over the next few years. Price volatility, with the resulting loss of dual-fuel customers to oil over peak periods, has occurred during the past two winters.

Conclusions

Natural gas production in during the warm months of 1990 was again limited by the demand for natural gas. However, during the 1989/1990 winter available supplies were almost fully utilized. Estimates of seasonal production capability are highly susceptible to error; however, the unused production capability could be close to zero for any very cold periods during the winter of 1990-91. The current, less-regulated gas market should be able to operate successfully with such a nearly balanced supply and demand picture. However, one should anticipate price volatility to be a key element in the seasonal allocation of gas supplies.

Footnotes

¹U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves -1989 Annual Report, EIA, October 1990.

²Short-Term Gas Supply Potential - 1989 Update, A.G.A. Energy Analysis 1989-8, August 25, 1989.

³"Behind the pipe" reserves are gas volumes that are known to exist in producing reservoirs but are at depths other than the zones currently being produced (usually shallower depths). When the strata that are being produced have been depleted, the well will be sealed at those production levels and production of the "behind the pipe" reserves will commence.

⁴Natural Gas Deliverability Study - Final Report, Interstate Oil Compact Commission, December 1984.

⁵Natural Gas Deliverability and Capacity Utilization as of January 1, 1990, Natural Gas Supply Association, October 1990.

⁶Natural Gas for the Coming Winter Heating Season, A.G.A., September 1990.

Appendix

Wells Drilled and Rig Count 1973-1990

<u>Year</u>	<u>Gas Well Completions¹</u>	<u>Total Wells Drilled¹</u>	<u>Rig Count²</u>
1973	6.98	27.69	1,194
1974	7.17	33.04	1,472
1975	8.17	38.89	1,660
1976	9.44	40.94	1,658
1977	12.12	45.86	2,001
1978	14.41	50.06	2,259
1979	15.17	51.91	2,177
1980	17.22	69.84	2,909
1981	19.91	90.03	3,970
1982	18.85	83.93	3,105
1983	14.39	75.29	2,232
1984	16.89	84.63	2,428
1985	14.18	69.93	1,980
1986	8.11	39.49	964
1987	7.55	35.46	936
1988	8.34	31.93	936
1989	9.40	28.28	869
1990	11.00 ³	32.49 ³	1,000 ³

1. In thousands of wells.

2. Weekly average.

3. Estimated using trends established in first eight months of 1990.

SOURCE: EIA, Monthly Energy Review, July 1990.

NOTE: Throughout this study, gas volumes (i.e., Tcf, Bcf, etc.) are used in lieu of energy values in Btu (i.e., quadrillion Btu or trillion Btu). The conversion factor employed is taken from the EIA Monthly Energy Review of July 1990. This conversion factor is 1,031 Btu per cubic foot of natural gas.

EDUCATION 2000

The natural gas industry's campaign
for educational excellence



Photocopy-Preservation

EDUCATION 2000
STRATEGIC PLAN

Drafted for
Education Committee
American Gas Association

By
Planning Task Force

Assisted By
Sextant Consultants, Inc.

June 1991

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INTRODUCTION

Since the National Commission on Excellence in Education issued its landmark report, "A Nation At Risk," eight years ago, there has been a growing concern and actions to improve American education. The nation's governors and the President have developed national education goals and proposed innovations such as the New American Schools. Business-education partnerships have been formed to change and improve education and there is extensive work being done by the Business Roundtable, the Conference Board, the Committee for Economic Development, and Chambers of Commerce at the national, state and local levels.

The A.G.A. Board of Directors' Resolution on National Education Goals adopted August 1, 1990¹ set the direction for the association. The resolution states both the need for such an effort and A.G.A.'s commitment to a "decade of active support of the new national effort to reform America's Education System."

The Education Committee charged the Planning Task Force to prepare a strategic plan for Education 2000, a ten year effort to improve America's education. The Planning Task Force has carried out the following efforts in preparing this plan:

- conducted a mail survey of all A.G.A. member companies,
- held background meetings in Washington, D.C., and Portland, Oregon culminating in a two-day planning workshop in Washington, D.C. on May 22-23, 1991,
- reviewed education reform literature and consulted with national education experts,
- retained Sextant Consultants, Inc. to develop background papers, facilitate the planning workshop, and assist in preparing the plan.

We believe this Strategic Plan and the work of the Planning Task Force provides a firm foundation upon which A.G.A. can implement an effective Education 2000 effort.

¹ For the full text of the resolution see Appendix A.

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I. EXECUTIVE SUMMARY

MISSION

The mission of Education 2000 is for the American Gas Association and its member companies to lead and support a ten year effort to help American education systems develop a nation of well educated citizens, consumers, and employees.

VISION

The vision for Education 2000 is that it will be an integral part of on-going efforts to advance education in America through the sustained involvement of A.G.A. and its member companies in education systems at all levels.

Education 2000 is an opportunity to involve all member companies and each of their employees in education initiatives, and an opportunity for the natural gas industry to lead and support partnerships with others involved in educational change.

CONSTITUENT GROUPS

A.G.A. member companies
Employees and retirees
Students and their parents
Educators and administrators
Government (federal, state, local)
Allied organizations

GOALS

Support member company efforts to be involved in educational change that make quality education available to all students, that improves the quality of school management, and that stimulates active and retired employees and their families to actively support efforts which improve education in their communities.

Advocate reform in education at state and local levels and support initiatives that help achieve the national education goals,² including linkages of education, social services and employment.

Develop partnerships with allied organizations to help achieve the national education goals.

1992 OBJECTIVES

Support Member Efforts:

Increase participation in Education 2000 by A.G.A. member companies to 60 percent by December 1992.

Establish an annual awards program to recognize the accomplishments of members and individuals by November, 1992.

Establish a clearinghouse for education issues and the education programs of members by January, 1992.

Develop a "how to" manual describing how a member company can become involved and be effective in education reform by December 1992.

Continue to publish four "Education Exchange" newsletters annually.

Publish a white paper on "What is an effective, model school?" which defines the type of school and school system that Education 2000 efforts are striving to achieve by September 1992.

Evaluate and obtain financial and human resources needed to implement Education 2000 by October, 1991.

² See Appendix B for a list of the National Education Goals.

Develop and implement a communications strategy for Education 2000 by January 1992.

Initiate a scholarship program for the training of new math and science teachers by December 1992.

Inform and brief other A.G.A. committees and regional gas associations about Education 2000.

Advocate Reform:

Host a national education summit meeting in Washington, D.C. in late 1992 for member companies and allied organizations. Invite President Bush to participate.

Secure the endorsement of ten state public utility commissions of the NARUC resolution in support of Education 2000 by December, 1992.

Sponsor a 1992 presidential debate on education issues.

Develop Partnerships:

Develop a national utility coalition for Education 2000 with electric, telephone, water, cable television and other local utilities by January, 1992.

Formalize a role for A.G.A. with the U.S. Department of Education concerning the New American Schools program by October, 1991.

Initiate discussions with the National Education Association, the American Federation of Teachers and other education organizations by October, 1991.

1995 OBJECTIVES

Support Member Efforts:

Increase participation in Education 2000 by A.G.A. member companies to 80 percent by December 1995.

Continue to recognize the accomplishments of members and individuals with annual awards.

Publish a white paper for members on a broad education issue every two years.

Develop technical support, training and planning assistance teams ("Smart Teams") made up of representatives from member companies and provide assistance on request to at least 10 member companies annually.

Prepare case studies and "lessons learned" reviews of member company efforts in Education 2000.

Advocate Reform:

Host a national education summit meeting in late 1995.

Secure the endorsement of twenty five state public utility commissions of the NARUC resolution in support of Education 2000 by December, 1995.

—
Sponsor a presidential debate on education issues in 1996.

Develop Partnerships:

Support involvement of at least 20 member companies in the Department of Education's New American Schools Program by September 1996.

Involve the national utility coalition in specific joint programs for educational improvement.

2000 OBJECTIVES

Support Member Efforts:

Increase participation in Education 2000 by A.G.A. member companies to 100 percent by December 1995.

Continue to recognize the accomplishments of members and individuals with annual awards.

Continue to publish a white paper for members on a broad education issue every two years.

Continue to provide "Smart Teams" to at least 15 member companies annually.

Prepare case studies and "lessons learned" reviews of member company efforts in Education 2000.

Advocate Reform:

Host a national education summit meeting in late 1998.

Secure the endorsement of 40 state public utility commissions of the NARUC resolution in support of Education 2000 by January, 2000.

Sponsor a presidential debate on education issues in 2000.

Develop Partnerships:

Support involvement of at least 40 member companies in the Department of Education's New American Schools Program by September 1996.

Continue existing efforts and initiate new joint programs for education improvement by the national utility coalition.

II. MISSION

The mission succinctly states the overall purpose of Education 2000 and explains why it exists.

The mission of Education 2000 is for the American Gas Association and its member companies to lead and support a ten year effort to help American education systems develop a nation of well educated citizens, consumers, and employees.

III. VISION

The vision describes what Education 2000 will be like in the future. The vision begins to define the direction of the initiative and what are anticipated results.

The vision for Education 2000 is that it be an integral part of on-going efforts to advance education in America through the sustained involvement of A.G.A. and its member companies in education systems at all levels.

Education 2000 is an opportunity to involve all member companies and each of their employees in education initiatives, and an opportunity for the natural gas industry to lead and support partnerships with others involved in educational change.

The Education 2000 effort will involve all A.G.A. member companies. Natural gas companies will be an important, constructive, unifying force for positive educational change in their communities. The Education 2000 initiative will be on the leading edge of educational change. Natural gas companies will be among the leaders in partnerships with education and coalitions with other businesses for educational reform and restructuring.

Starting with a few member companies involved in a planned effort at local educational change, there will develop an ever expanding group of natural gas companies with experience and competence in educational restructuring.

The educational partnership efforts of member companies can start at what can be considered "helping hands" efforts to education. The efforts will increase in commitment and impact to include programmatic initiatives, compacts and collaborative efforts aimed at systemic change, and fundamental policy shifts and changes. Partnership opportunities at every level will be both welcomed and encouraged.

Ultimately all member A.G.A. companies will be involved in Education 2000. Further, every employee of every member company will come to know both the challenge and have the opportunity to be a part of Education 2000's initiatives.

On a biannual basis the A.G.A. will sponsor an Education Summit which includes member companies, major educational organizations, the U.S. Department of Education and others involved in educational reform and restructuring.

The Education 2000 effort will be a well-managed, self-sustaining process combining planning, research, program implementation, communication, and evaluation.

Member companies will also find there is a highly competent, well prepared and motivated work force to draw from. Company spending on remedial training will be virtually eliminated and there will be reduced need for adult literacy programs as the school systems are better educating the work force. Because both gas company employees and customers will be better educated, employees and customers will be able to use and adapt to new technologies used or offered by natural gas companies.

IV. CONSTITUENT GROUPS

Constituent groups, or "stakeholders," are groups which can have a positive or negative impact on the success of Education 2000. They can assist and support the activities or create problems by disagreeing with the activities.

Education 2000 is aimed at the following constituent groups:

- A.G.A. member companies
- Employees and retirees
- Students and their parents
- Educators and administrators
- Government (federal, state, local)
- Allied organizations (utilities, business groups, labor)

A.G.A. Member Companies

Education 2000's primary activities will be at the local level in which member companies provide leadership and partnership with education for change. Local natural gas companies can should become part of the education change efforts in their communities and states so that whenever educational change is being considered, natural gas companies are recognized as one of the important players.

Whether a gas company's current education efforts are extensive or few, the company can start where it is and build on its existing knowledge, relationships, and experience.

PUBLIC EDUCATION REFORM: A BUSINESS NECESSITY

Address by

John H. Croom
First Vice Chairman
American Gas Association
and
Chairman and CEO
The Columbia Gas System, Inc.

before the National Association of
Regulatory Utility Commissioners
Committee on Administration

and

**A National Association of Regulatory Utility
Commissioners Resolution Endorsing Utility
Education Reform Programs**

February 27, 1991
Washington, D.C.



Printed in U.S.A.

INTRODUCTION:

Announcing their six national education goals in 1990, President Bush and the nation's governors called for "sweeping fundamental changes" in the U.S. public education system and urged all Americans, and especially the business community, to become involved in "meeting the challenge."

The nation's gas, electric, telephone and water utilities recognize that their ability to continue to provide safe, reliable and efficient service in the future depends on the availability of a work force that is adequately educated in the basic skills demanded by our very competitive and technological world. Presently, our nation's primary and secondary schools are not preparing that work force.

As the chairman and CEO of a one of the nation's largest diversified natural gas companies and the vice chairman of the American Gas Association, John Croom has come face-to-face with the education related business issues confronting the utility industry. His presentation, "Public Education Reform: A Business Necessity" before the National Association of Regulatory Utility Commissioners, discusses these critical issues and opportunities to address them.

The National Association of Regulatory Utility Commissioners, a quasi-governmental organization whose members are the government agencies from the 50 states and the District of Columbia engaged in the regulation of utilities, also has recognized that utility education reform initiatives are necessary business activities in the best interests of utility consumers, the utilities and state commissions. The Association's resolution that follows details this concern and commitment to action.

John H. Croom serves as the chairman, president and CEO of The Columbia Gas System, Inc. and as vice chairman of the American Gas Association. He is also chairman of A.G.A.'s Education and Government Relations Committees, a member of the business Roundtable and a member of the Delaware Business/Public Education Council. The Columbia Gas System, Inc. is active in all phases of the natural gas business. Its transmission, storage and distribution operations serve, directly or indirectly, over eight million customers in 14 states.

Founded in 1918, the American Gas Association (A.G.A) is the national trade association for the natural gas distribution and transmission industries. Its more than 250 members account for over 80 percent of the natural gas energy delivered to U.S. consumers. In August 1990, the Association committed its resources to a decade of active support of the education reform goals set out by President Bush and the nation's governors. This campaign is called "Education 2000."

The National Association of Regulatory Utility Commissioners (NARUC) is a quasi-governmental nonprofit corporation founded in 1889. Within its membership are the governmental agencies of the fifty states and of the District of Columbia, Puerto Rico and the Virgin Islands engaged in the regulation of utilities and carriers. The chief objective is to serve the consumer interest by seeking to improve the quality and effectiveness of public regulation in America.

For addition copies of this brochure or more information on A.G.A.'s Education 2000 commitment please contact: Steven C. Kussmann, American Gas Association, 1515 Wilson Boulevard, Arlington, VA 22209, (703) 841-8670

(iv) the economic and social vitality of the Nation and the communities served by utilities, communities with which these utilities have a historic and on-going commitment, depends on a literate and well educated citizenship; therefore, be it

Resolved, that the National Association of Regulatory Utility Commissioners recognizes the importance to the nation's utilities, their customers and the communities they serve of the national efforts to effect fundamental changes and improvements in the nation's primary and secondary education systems, and be it further

Resolved, that the National Association of Regulatory Utility Commissioners recognizes the unique position and skills of the nation's utilities in their communities to assist in having such fundamental changes adopted; and be it further

Resolved, that the National Association of Regulatory Utility Commissioners endorses, as consistent with a utility's long-range business planning for safe, reliable and efficient operations, those efforts and programs undertaken by utilities in furtherance of the national effort to reform and improve the American education system; and be it further

Resolved, that the National Association of Regulatory Utility Commissioners urges its members to support the various efforts and programs of their utilities directed to the reform and improvement of the education systems in their communities.

Sponsored by:
Commissioner James A. Burg, South Dakota
Judge Thomas P. Harwood, Jr., Virginia

Adopted NARUC Executive Committee
February 27, 1991

PUBLIC EDUCATION REFORM: A BUSINESS NECESSITY

by
John H. Croom

The issue of education reform that you are considering today is of critical importance to National Association of Regulatory Utility Commissioners, the utilities it oversees and the millions of customers these utilities serve.

I appreciate the opportunity to speak before the committee on this subject. While I appear directly for the American Gas Association and its members, I know that my views are shared by executives in all the utility industries, to say nothing of many other businessmen now engaged in efforts to improve the nation's public schools.

In fact, the letters Commissioner Burg has received from the Edison Electric Institute, the United States Telephone Association and the National Association of Water Companies endorsing the education reform resolution before you demonstrate the utility industry's shared commitment to the vital task of improving the nation's primary and secondary education systems.

In the time available, I won't burden you with a long recitation of the country's education problems. As public officials you must be aware of the concerns that have been expressed in your states about the increasing failure of today's education system to prepare adequately young people with the basic skills demanded by a very competitive and technological world.

Too often utilities and other businesses find high school graduates unable to complete

simple job applications or solve ordinary math problems. We read that the standard SAT scores for youngsters seeking to go on to college are below those of past years. And not only are today's youngsters poorly prepared in comparison to those graduated in earlier years, but American students rank well below those in most other industrial nations in such basic subjects as math and science.

The governors of all the states have met with the President in a historic summit to consider how the nation is at risk from an outdated education system. The President has laid out six special education goals to be achieved by the year 2000, and the National Governors Association has endorsed those same goals. As you may know, the governors' statement called for "sweeping fundamental changes in our education system."

The effort to improve the public education process requires the support of many segments of society. Business has been especially called upon by the President and the governors to devote its resources to bringing about the national education goals.

Many business organizations - The Conference Board, the Business Roundtable, the U.S. Chamber of Commerce, the National Alliance of Business, the National Association of Manufacturers and others - have undertaken to mobilize resources and conduct programs aimed at helping the education reform effort. The American Gas Association has committed itself to a 10-year program in aid of the national education goals entitled Education 2000 and is encouraging its 250 members in their individual efforts.

The concern of business in general and of the nation's utilities in particular for education reform is very, very real. We face a

must be made... All Americans have an important stake in the success of our education system, and every part of our society must be involved in meeting the challenge;" and

Whereas, as part of the National Energy Strategy, Federal Agencies and the President are recognizing that the Nation's ability to confront its energy challenges is as much dependent on the success of its educational system and the development of its human resources as on the wise use of its natural resources; and

Whereas, the National Association of Regulatory Utility Commissioners recognizes that the future quality and success of the utility regulatory process will depend heavily on the quality of the nation's primary and secondary school system; and

Whereas, the National Association of Regulatory Utility Commissioners recognizes that the safety, reliability and efficiency of future utility service will depend heavily on the success of the "sweeping fundamental changes in our education system" recommended by the Governors' Association because:

- (i) the nation's utilities, their contractors and suppliers and the businesses they serve must have access to an adequately educated work force;
- (ii) the future ability of the Nation's utilities to provide safe, reliable and efficient service is threatened by the current inadequacies and declining quality of our primary and secondary education system and the growing lack of qualified human resources;
- (iii) the ability of the Nation's utilities to communicate effectively with all their customers depends upon a broad base of literate consumers supported by an effective education system; and

NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS

Resolution Endorsing Utility Programs That Support National Education Reform Goals

Whereas, the National Association of Regulatory Utility Commissioners has a long history of commitment to educational excellence; and

Whereas, the Nation has come to recognize that the primary and secondary schooling process needs to be reformed if it is to adequately educate young people in the basic skills needed to maintain and enhance the social and economic vitality on which our democracy depends; and

Whereas, it is recognized that the Nation's ability to remain competitive globally and to commercialize technology depends on the availability of a skilled, scientifically literate work force and that the current low level of achievement among precollege students, particularly in the areas of math and science, is resulting in a growing shortage of technically skilled workers; and

Whereas, this recognition resulted in the new national education goals announced by President Bush in his 1990 State of the Union message and adopted by the National Governors' Association in February 1990; and

Whereas, in adopting these goals, the Governors' Association said: "Sweeping fundamental changes in our education system

serious problem in maintaining the quality of work force needed to operate our systems efficiently, safely and dependably. The issue is as simple as that.

At your national convention just last November, Richard Metzler and Associates laid out the problem in graphic detail in a presentation titled "The Coming Crunch in Utility Human Capital."

The presentation made clear that America will experience a shrinking population and one with a different cultural and ethnic mix than now exists. One clear message for utilities is that there will be fewer potential future employees to choose from and the background of many will be different from those in the labor pool today.

The two specific points stood out for me in reading what you were told:

First, seven out of ten of these new utility employees will be a woman, or from an ethnic minority, or an immigrant, or a combination thereof.

Second, unless we achieve those sweeping changes the governors called for, the educational qualifications of those new workers will be lower than in years past.

The Metzler report was a prudent assessment of the problems which utilities will face, and I commend you for examining the work force issue in a timely manner.

The American Gas Association conducted a similar study of its long-range human capital needs several years ago and reached many of the same conclusions as the Metzler organization. The electric, telephone and water utilities view these issues with equal concern.

Both studies also made clear that the nature of utility work is changing. Jobs are more and more high tech, and more frequently they call for employees to be decision makers. Required skill levels are rising. The prospective employees who come through the door today should be better equipped in the three Rs than their older siblings, and those we see five years from now should be even better. As we are finding, such is not the case; far from it.

The message is clear and incontestable. If utilities are to maintain the ability to serve their customers properly in the future, they must act now to assure the availability of skilled people to operate their properties. And that simply means getting involved at the community level in the national effort to raise the quality of the K-12 education being provided to young people.

Beyond the concern for its work force, utilities must also consider the nature of their customer groups if today's education trends continue. Will customers fully understand their bills, comprehend safety messages and generally grasp the communications directed to them? Will the employees of the contractors on whom utilities must depend be as well trained as those available today? And will the public generally be sufficiently literate to consider, much less comprehend, business-related issues that come before them?

More broadly, will the businesses and industries we serve and on which community economic health depends find the quality of employee they need to compete in an increasingly technical world? Who can say that youngsters in Europe and Asia who outscore American high school graduates in scholastic tests won't also best them in the marketplace?

This brings me to the resolution that your committee is considering today. I believe it is important for several reasons.

First, it endorses efforts which utilities already have underway to support education improvement and reform. It also encourages other companies to become involved.

Second, and more importantly, it recognizes that efforts to improve public education are a necessary and legitimate business expense, that they are in fact prudent outlays that forestall more costly remedial actions in the future. That message is important for companies to hear and for state commissions to understand.

Regulators realize that reasonable efforts and related expenses to provide a skilled and dependable work force are as much operating costs as wages and benefits, maintenance, materials and supplies, taxes or depreciation.

As the human capital crunch develops, utilities will be judged in the future on how they responded to the warnings that were given of the emerging crunch in human resources.

Regulators will be similarly judged. Did they fulfill their responsibility to see that skilled work forces are in place to provide adequate and reliable utility services at reasonable rates? Did they encourage efforts to deal with the national educational crises?

The resolution provides a positive response to those questions.

I thank you for the opportunity to discuss with you this important problem jeopardizing our nation and its future security.

By contrast, our current training and re-training programs covering all distribution employees run to about \$4.50 per customer annually. These are costs certain to rise unless the current trends in the quality of high school graduates improve, and the human capital crunch envisioned by the Metzler study will surely boost training and other personnel costs even more.

Consider the comparison: roughly 24 cents toward strengthening the skill of young people before they leave high school and enter the work force versus \$4.50 after they've found a job.

Now, I will grant that those numbers might vary to even a considerable extent when spread over the whole gas industry distribution segment of more than 200,000 employees, not to speak of 64,000 in the transmission segment. But even if the 24 cents doubled and training costs halved, the economic good sense of putting money into improving the basic learning process can't reasonably be questioned. And many benefits of a better schooling for young people do not lend themselves to precise measurement.

A popular TV advertisement for a gasoline additive proclaimed "You can pay me now or you can pay me later." How very appropriate that message is when talking about education. The dollars we invest in a more educated work force and a more literate society can return real gains that we can measure in our business, in our economy and in the very quality of our lives. On the other hand, the "...or pay me later" can be translated into high costs for unemployment benefits, welfare, law enforcement, and the higher training costs I cited. On a broader scale, as a society we will pay the cost of being a weaker competitor in the global economy we see developing. From a practical point of view, a business sense, the "pay me later" way makes no sense at all.

Such questions may strike some as unreal worries, but when surveys show that a shockingly small percentage of graduating seniors can write simple job application letters or handle basic two-step math problems, the concerns take on a sad reality.

There should be no doubt that for utilities the education problems for our nation are a legitimate business issue. The issue of securing literate employees is no less important than securing capital at reasonable rates, investing prudently in pipeline building projects, or guarding against environmental damages.

Having identified an issue to be dealt with, utilities then face several questions: What actions can they take to aid in overcoming the problem? What resources do they bring to the effort? Is the use of these resources prudent?

In answering such questions utilities can draw somewhat on their recent experience in the educational effort to inform the public on how utility rates are decided. The highly successful "The Balancing Act" program developed in cooperation with NARUC provided a model for reaching out to schools and enlisting the aid of employees to deal with an educational effort.

Similarly, the programs which many utilities have maintained to provide energy information for teachers and schools provides useful experience for working with educators.

Building on such a base, utilities are working generally on what in the Columbia system we are calling a three C approach to the three Rs. The three Cs are communication, cooperation and collaboration.

Communication focuses mainly on helping create awareness among employees, customers and the public of the education problems facing the country. It utilizes existing publications and other communications tools in response to the request of government leaders and educators to raise the cry of alarm. Because their operations touch broad audiences, utilities are especially well equipped to carry such messages.

Cooperation means that utilities will help organize community and state coalitions to tackle education issues. It is clear that all elements of society must have a hand in raising the education standards. All must cooperate. Business can bring its talents and experience in problem solving to such efforts. Chambers of Commerce in many cities are mobilizing local concern for education. Again, utilities can play a leading role, involved as they are in most segments of a community.

Collaboration responds to the calls from the education community - teachers and principals - that they need help right in the schools. They need tutors to work with youngsters who need a hand with their reading, math and other subjects. They need business people to demonstrate how learning pays off in holding a job. They need people with special talents in science or math or other fields to expand on difficult lesson material. They need the advice of business people on matters related to running a school property more efficiently.

All of these activities are essentially people-intensive programs. They use the skills, interests and talents of utility people to further the basic training of young people now in the public schools, to enhance the efficiency of school organizations, or to help mobilize community efforts for education reform.

I want to make clear that the programs of the type I am describing are not public relations ventures. There are better ways to win friends than stirring community concerns about education and being in some cases the burr under the saddle to stimulate action. Those who work for education improvement seldom can offer the proverbial spoon full of sugar to help the medicine go down. We are talking about securing needed business resources, not a public relations exercise.

The Metzler presentation to NARUC last fall suggested a number of possible solutions to the coming crunch in human capital. For the most part these would result in higher expenses for the utilities: more training and re-training, higher salaries, increased benefits, increased recruiting and extended retirement dates.

Some of these steps may eventually be necessary. However, much of these expenses can be avoided by a more timely and direct effort to lift the whole quality level of high school graduates, and thereby create a larger pool of qualified applicants. Business can make more effective investments in human capital by helping young people get a sound grounding in the three Rs.

Let me cite just two figures that we developed in my company.

As Columbia has mobilized its efforts to aid education reform along the people-intensive lines I have described, we established a policy which allows employees to be away from the job site for up to four hours a month without loss of pay for approved education support activities. Our studies show that if as many as 1000 or 20 percent of our 5,000 distribution company employees volunteer for some school activity under this policy, our cost would be exceedingly moderate, expressed on a per customer basis it would amount to about 24 cents a year.

Employees and retirees

Employees at every level within a gas company can play a role in Education 2000. Their roles might be as a more informed and effective parent with their own children's learning; they may be on school committees or school boards, their participation facilitated by release time policies of their companies; they may serve on task forces jointly with educators or students in solving real community problems; or they may be tutors and mentors. The range of roles is as varied as there are challenges and opportunities for partnerships with schools.

Retirees are a special human resource who can work effectively with schools and their former employers in educational change efforts.

Students and their parents

The ultimate "customer" in education is the student. Students are not "products" who are processed and given education. Rather they are people who are active participants in the process of education. Parents are instrumental in the educational process, both in the value they hold education, the role models they provide, and the early learning of youngsters before they enter the education system. Involvement of both students and parents in the educational change process is an important factor of any change effort.

Educators and administrators

Teachers and school staff are the people involved in education day to day. Natural gas companies will want to form partnerships with educators and administrators to formulate educational change. This is not an adversarial relationship, but one of mutual support, cooperation, and involvement.

Government (federal, state, local)

At the local level, approximately half of local government revenues are devoted to public schools. This makes local school districts as governmental entities a vitally important institution in community life. State governments play a critically important role in both funding education and setting school standards. In our system, the federal government's role is more limited, although there are important areas of leadership and innovation, education research, and programs for specialized populations. Natural gas companies may be interacting with each of these levels of government in the educational change process.

Allied organizations (utilities, business organizations, labor)

Education 2000's partnership efforts can extend to other utilities (electric, telephone, water, cable television). The utility industry can form a partnership to help education in its change and renewal efforts and multiply its effectiveness through collaborative efforts.

The partnership of A.G.A. should include major organizations representing working teachers, administrators and support staff including the National Education Association and the American Federation of Teachers. The partnership of management and labor in education can build a force for change just as it has in many natural gas companies and other industries. If divided and adversarial, change efforts can be frustrated and stalled.

V. EDUCATION 2000 GOALS

Goals are the fundamentals that guide the effort. A goal usually is enduring and timeless; a direction towards which the effort is directed.

- Goal 1: Support member company efforts to be involved in educational change to provide quality education to all students and improve the quality of school management, and to stimulate active and retired employees and their families to actively support efforts which improve education in their communities.
- Goal 2: Advocate reform in education at state and local levels and support initiatives that help achieve the national education goals including linkages of education, social services and employment.
- Goal 3: Develop partnerships with allied organizations to help achieve the national education goals.

VI. OBJECTIVES FOR 1992

Objectives are specific targets which are quantifiable so that their achievement can be determined. Objectives are developed for three time periods: the short terms (1992), the mid-term (1993-1996) and the long term (1996-2000).

The 1992 objectives establish a foundation for the Education 2000 effort. Building blocks include establishing relationships with other utilities and national organizations, developing a "how to" education planning workbook, developing a "White Paper" on what desirable school systems are like, and the first bi-annual Education Summit meeting.

Objectives for Goal 1. Support member company efforts to be involved in educational change.

Increase participation in Education 2000 by A.G.A. member companies to 60 percent by December 1992.

Establish an annual awards program to recognize the accomplishments of members and individuals by November, 1992.

Establish a clearinghouse for education issues and the education programs of members by January, 1992.

Develop a "how to" manual describing how a member company can become involved and be effective in education reform by December 1992.

Continue to publish four "Education Exchange" newsletters annually.

Publish a white paper on "What is an effective, model school?" which defines the type of school and school system that Education 2000 efforts are striving to achieve by September 1992.

Evaluate and obtain financial and human resources needed to implement Education 2000 by October, 1991.

Develop and implement a communications strategy for Education 2000 by January 1992.

Initiate a scholarship program for the training of new math and science teachers by December 1992.

Inform and brief other A.G.A. committees and regional gas associations about Education 2000.

Objectives for Goal 2: Advocate reform in education at state and local levels.

Host a national education summit meeting in Washington, D.C. in late 1992 for member companies and allied organizations. Invite President Bush to participate.

Secure the endorsement of ten state public utility commissions of the NARUC resolution in support of Education 2000 by December, 1992.

Sponsor a 1992 presidential debate on education issues.

Objectives for Goal 3: Develop partnerships with allied organizations.

Develop a national utility coalition for Education 2000 with electric, telephone, water, cable television and other local utilities by January, 1992.

Formalize a role for A.G.A. with the U.S. Department of Education concerning the New American Schools program by October, 1991.

Initiate discussions with the National Education Association, the American Federation of Teachers and other education organizations by October, 1991.

VII. OBJECTIVES FOR 1995

The objectives for the mid-range period builds on the foundation established in 1992. Member companies will be encouraged and assisted in undertaking their own Education 2000 efforts. This will start with an appraisal of their current educational efforts and development of a strategic educational plan to build partnership relations with local educational institutions.

A fundamental premise of Education 2000 is that the effort will "learn as it goes" building on the experiences of A.G.A. and member companies in becoming increasingly involved in educational change.

Objectives for Goal 1. Support member company efforts to be involved in educational change.

Increase participation in Education 2000 by A.G.A. member companies to 80 percent by December 1995.

Continue to recognize the accomplishments of members and individuals with annual rewards.

Publish a white paper for members on a broad education issue every two years.

Develop technical support, training and planning assistance teams ("Smart Teams") made up of representatives from member companies and provide assistance on request to at least 10 member companies annually.

Prepare case studies and "lessons learned" reviews of member company efforts in Education 2000.

Objectives for Goal 2: Advocate reform in education at state and local levels.

Host a national education summit meeting in late 1995.

Secure the endorsement of twenty five state public utility commissions of the NARUC resolution in support of Education 2000 by December, 1995.

Sponsor a presidential debate on education issues in 1996.

Objectives for Goal 3: Develop partnerships with allied organizations.

Support involvement of at least 20 member companies in the Department of Education's New American Schools Program by September 1996.

Involve the national utility coalition in specific joint programs for educational improvement.

VIII. OBJECTIVES FOR 2000

The objectives for the long-term are sketched out here. These will be reviewed and revised in 1996 by A.G.A. based upon the experiences in Education 2000 for 1992-1996.

Objectives for Goal 1. Support member company efforts to be involved in educational change.

Increase participation in Education 2000 by A.G.A. member companies to 100 percent by December 1995.

Continue to recognize the accomplishments of members and individuals with annual rewards.

Continue to publish a white paper for members on a broad education issue every two years.

Continue to provide "Smart Teams" to at least 15 member companies annually.

Education 2000.

Objectives for Goal 2: Advocate reform in education at state and local levels.

Host a national education summit meeting in late 1998.

Secure the endorsement of 40 state public utility commissions of the NARUC resolution in support of Education 2000 by January, 2000.

Sponsor a presidential debate on education issues in 2000.

Objectives for Goal 3: Develop partnerships with allied organizations.

Support involvement of at least 40 member companies in the Department of Education's New American Schools Program by September 1996.

Continue existing efforts and initiate new joint programs for education improvement by the national utility coalition.

APPENDIX A

A.G.A. BOARD OF DIRECTORS RESOLUTION ON NATIONAL EDUCATION GOALS

Whereas, the future competitiveness of the natural gas industry is threatened by the critical state of the nation's educational system; and

Whereas, the future work force of the natural gas industry will be inadequately educated to meet the industry's human resource need; and

Whereas, the economic and social vitality of the communities served by the natural gas industry are being adversely affected by the quality of the educational services in those communities; and

Whereas, the ability of natural gas company customers to be informed and literate consumers depends on the quality of the educational system; and

Whereas, the natural gas industry has a historical commitment to the economic and social vitality of the nation; and

Therefore, be it so resolved that the American Gas Association commits its resources to a decade of active support of the new national effort to reform America's Education System.

-- Developed by the A.G.A. Educational Programs Subcommittee and
the A.G.A. Education Advisory Council.
Adopted August 1, 1990.

APPENDIX B

AMERICA'S EDUCATION GOALS

By the year 2000:

1. All children in America will start school ready to learn.
2. The high school graduation rate will increase to at least 90 percent.
3. American students will leave grades four, eight and twelve having demonstrated competency in challenging subject matter including English, mathematics, science, history, and geography; and every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our modern economy.
4. U.S. students will be first in the world in science and mathematics achievement.
5. Every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.
6. Every school in America will be free of drugs and violence and will offer a disciplined environment conducive to learning.

Source: "America 2000, An Education Strategy", U.S. Department of Education, April 1991. Copies available from 1-800-872-5327.

APPENDIX C

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EDUCATION 2000
BACKGROUND PAPERS

Prepared for
Planning Task Force
Of the
Education Committee
American Gas Association

By
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Portland, Oregon

June 1991

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INTRODUCTION

These papers were prepared for the Planning Task Force by a team of education and planning specialists. The papers provide the necessary foundation for the work of the Task Force to prepare a Strategic Plan for Education 2000. The papers and their authors are as follows:

1. Restructuring Today's Schools to Meet Tomorrow's Challenges.

This paper provides an understanding of why today's schools are undergoing a basic restructuring and some of the leading efforts towards change and renewal. It was prepared by John Villaume and Gary Obermeyer.

2. Business Education Partnerships: Strategic Opportunities to Help Achieve America's National Education Goals.

This paper focuses on business-education partnerships and summarizes the activity as well as the lessons learned from the extensive work that has been done. The paper was prepared by Mimi Maduro.

3. The Education 2000 Process: A Method For Local Educational Change.

This paper outlines a method for A.G.A. member companies to plan and implement an educational change process at the local or state level. The paper was prepared by Kent Layden and Kurt Wehbring.

4. The Education 2000 Survey: A Survey of A.G.A. Member Companies.

This paper summarizes a mail survey conducted by A.G.A. in January 1991 to provide benchmark data on existing efforts and perceptions about educational change and reform. The paper was prepared by Kurt Wehbring.

I. RESTRUCTURING TODAY'S SCHOOLS TO MEET TOMORROW'S CHALLENGES

EXECUTIVE SUMMARY

This paper discusses some of the major issues underlying the current movement to reform and restructure schools. The paper is intended to provide A.G.A. and its members an understanding as they become engaged in discussion and actions that will make difference in American schools.

Since "A Nation at Risk" appeared in 1983, concern about the crisis in America's schools has steadily grown. Parents, teachers, school administrators, civic and business leaders have noted high drop-out rates, declining test scores, poor academic performance, high teen-age pregnancy, drug abuse and violence in schools. The continued and thoughtful dialogue within and among various stakeholder groups has developed an awareness that many of the problems in America's schools are symptoms of much deeper and more fundamental problems facing both schools and society. The governors' education goals for the year 2000 adopted by the President are a reflection of a deepening consensus that the time has come for fundamental change.

Fundamental change in education is not unique, nor is the involvement of business. The crisis education faces today has similarities to a crisis a century ago. At that time leaders of business and industry helped reshape social institutions to meet the needs of the Industrial Age. Currently, educational and business leaders, each undergoing their own transformations, have begun to explore ways they can work together.

The transformation of America's schools has already begun. It is based on practices and principles which parallel organizational change and innovation in the corporate world. Schools and school systems across the nation are responding to the call for restructuring as a fundamentally different approach to change and improvement. The parallel developments of restructuring schools and organizational restructuring in business present a special opportunity for collaboration between and among education and business leaders.

1. Today's schools are built on a century-old vision.

In the mid-1800's, powerful currents of change were sweeping the nation. Industrialization, immigration, urbanization, and technological innovations were quickly outstripping the capacity of an educational system that had been developed to serve a largely rural and agricultural society. In response to that crisis, educators led by Horace Mann, along with the captains of business, industry, and labor mounted the Common School Crusade. They succeeded in forging their varied perspectives into a vision of schooling to serve the emerging society.

Over the course of the next few decades, school practice evolved as a mirror image of the industrial economy--dominated by the methodology of high-volume production. Borrowing from the Prussian system of education, schools were organized for factory-like instruction through an assembly-line curriculum, taught in predictable units of time, to homogenous age-graded groups, and controlled by a system of standardized evaluation intended to grade and sort students.

Underlying the Common School Crusade was the belief that only about 20 percent of young people needed to be educated as leaders, thinkers and goal-setters. Another 30 percent needed enough education to effectively and efficiently implement the leaders' decisions. Another 30 percent would be needed to carry out the mindless, repetitive tasks of the factory. Thinking was not only unnecessary; it was problematic in the authoritarian work place. The last 20 percent were not needed by industry and were considered probably incapable of learning anyway.

The Common School Model accomplished what it was designed to do. U.S. schools produced many cohorts of dependable workers, able mid-level managers, and top-level leaders to produce industrial and commercial development far beyond anything the world had seen before. But the age of limitless resources and wealth through high-volume production is waning; the age of information and innovation has arrived.

2. The pace and direction of social and economic change are rapidly outstripping the capacity of factory-style schooling.

The real crisis in today's schools arises from the fact they reflect and operate on a model of an industrial society which no longer fits the realities of a changing, information-age economy.

Since World War II, massive currents of economic, political, and social change again have swept the country. The information revolution, international economic competition, shifts away from manufacturing toward trade and services, environmental concerns (global warming, acid rain, ozone depletion), major demographic shifts, systemization and robotics, immigration larger than any in the nation's history, the civil rights and women's

movements all have strained the capacity of the nation's institutions to cope. Schools are no exception.

Scores of educational studies and reports from special blue ribbon committees have contributed to the conclusion that schools are failing to produce the kind of citizens and workers needed to assure economic competitiveness and a high standard of living. There is no need to detail those accounts here, but it is worthwhile to note some of their findings.

One out of four students entering grade school does not graduate from high school. For minorities and the rural and urban poor, the dropout rate is much higher. Only one-half of all who do graduate from high school go on to college. Of those that go on to college, only 40 percent obtain their bachelors degree. Thus for every 100 who enter the system, only 20 complete the full 16 years.

What about those who drop out before finishing high school? Every year about one million students do drop out. That translates into \$240 billion in lost earnings and foregone taxes over the lifetime of each year's group of dropouts--nearly two-and-a-half trillion for the past ten years during which dropout rates have been that high.

What about those who complete high school, but do not go on to college? Only one out of four high school graduates can accurately summarize in writing a lengthy newspaper column. Three out of four cannot use a bus schedule to select an appropriate bus for given departures and arrivals. In 1969, 18-to-24-year olds in the U.S. ranked first in literacy skills among the nations for which data were available. Ten years later Americans in that age bracket ranked 21st. And in 1989 the U.S. ranked 49th in literacy.

If one looks back at the vision of the Common School, then the outcomes of the U.S. education should be no surprise. That vision regarded 20 percent of the population as disposable anyway. Nor should it be any surprise to learn, as the American Society for Training and Development reports, that corporations have difficulty finding the workers they need and have to spend hundreds of millions of dollars each year on remedial education. Nor should it be a surprise to learn that U.S. firms in 1989 imported one million, foreign-born, foreign-educated young people because they could not find American youth with the aptitude to train for high-paying, entry-level jobs.

One example: in 1989 the nation's largest bank, Citibank, hired 1,800 foreign-born, foreign-educated, young people without a day of education beyond high school and paid them four times what cashiers and tellers make to install and maintain the banks automatic tellers. The bank could not fill the jobs with American school graduates.

Long gone are the days when reading, writing, and arithmetic could be considered the full extent of learning. These skills remain essentials. However, the basics of the 19th century have been eclipsed by a new set of basic skills. These include:

The ability to abstract--to discover patterns and meaning in disordered data, to manipulate abstractions, and to rearrange new information in ways that generate new solutions, problems, and choices.

The ability to think systemically--to see reality as a web of inter-linked causes and consequences and to remain uneasy with conventional explanations of how things fit together, always trying to identify more basic causes and underlying relationships.

The ability to solve problems--to identify a problem, to specify it so it can be addressed, and to mobilize resources to address it.

The ability to collaborate--to work with others in solving complex problems where team members complement one another's skills, critically review one another's work, support one another, learn from one another, and hold one another accountable.

The ability to experiment--to be willing and able to look at and do things in new ways.

The ability to be self-motivated--to have the discipline and vitality to mobilize oneself, resources, and others to do a task.

The ability to evaluate oneself--to seek out and assess one's own strengths and weaknesses accurately on a regular basis and hold oneself accountable for performance.

The ability to communicate well--The ability to communicate well in a multi-media world.

It is increasingly recognized that America can no longer afford to push out or under-educate anyone. As the rest of the world industrializes, the country's position depends more on the ability to innovate, to be more creative and productive, in the work place and in civic life. Doing that requires developing the new skills described above. As the population ages, virtually all young people will be needed to fill significant political, social, and economic roles. This nation cannot afford to have up to 30 percent of its current work force bereft of the basic skills needed to adapt to work place changes. Nor can it afford to spend \$260 billion a year to prepare learners for yesterday's work.

It is now widely recognized that continued quality of life is dependent on equity and excellence in learning opportunities. There is a convergence of interests in terms of economics, social justice and the environment. Good schools, successful businesses, and healthy communities do not exist in isolation. Each contributes to the other. All depend on the fullest possible participation of creative, capable and empowered individuals. The old system of educational grading and sorting is not what the nation now needs; it no longer serves the nation's interests.

3. Educators already have recognized the need for major change; many have started the transformation.

The changing context and expectations for education have not gone unnoticed among educators. Perhaps the greatest single influence in public education over the past three decades has been the civil rights movement which greatly expanded opportunities for minorities, women, and the handicapped. Integration stimulated an interest in and need for more pluralistic and multi-cultural approaches to education. The women's movement helped put laws on the books that have gone far to assure that young women enjoy the same choices as young men. Special education legislation, especially at the federal level, established the right of all students, regardless of handicapping conditions, access to quality education. With the force of federal law, a precedent has been set in which parents are partners in determining appropriate education tailored to the individual needs of students. In other words, the technology of personalized, student-centered learning is in all public schools. With additional incentives and support it can extend to all students.

Great strides in helping all students be successful were made with the establishment of programs funded through Head Start. Longitudinal studies have demonstrated that every dollar invested in getting kids to school ready to learn returns five dollars savings in reduced welfare, police, and prison costs. And those benefits are aside from improvements in the personal lives of students who complete Head Start.

Educational research has helped reshape beliefs about learning. A major influence in beliefs about the potential for learning has been the Effective Schools Movement. Ron Edmonds and others using methodology similar to what Peters and Waterman used to study highly successful businesses, extracted the factors contributing to success at exceptional inner-city schools. Their efforts led educators and researchers to move out of the lab into schools and to switch from macro analysis to analysis of education's operational units. Subsequently Edmonds and his colleagues put together a movement involving many teachers in schools based on high expectations for students and strong leadership in the school building.

Cognitive research of the last two decades has led to a new understanding of intelligence and disproved myths about the limits to learning. There may be no real limits to learning. The capacity for learning begins before birth and continues throughout life. These principles are put into practice in Henry Levin's Accelerated Schools.

Howard Gardner and others have concluded that intelligence has multiple dimensions-spatial, kinesthetic, interpersonal, intrapersonal, and artistic dimensions as well as the usually identified verbal-linguistic, logical-mathematical. Virtually all learners are highly intelligent in one or more of these dimensions. Learning is maximized when instruction is personalized to match the strengths of the individual.

Learning styles workshops are among the most popular of workshops among school practitioners. Anthony Gregoric, U of Wisconsin, among others, has been playing to packed houses for well over a decade. Experience has shown that knowing and understanding individuals empowers teachers to tailor learning to their students' needs.

The Johnsons at the University of Minnesota and Robert Slavin and his associates at Johns-Hopkins University conducted research focusing on cooperative learning. Instructional strategies based on their findings are now employed in scores of school systems across the country. In the cooperative classroom, teachers are able to concentrate on developing learning and social skills while students assume a more active role in learning. Students of all ability levels learn from each other while learning skills of cooperation and collaboration.

Concepts about how to run a classroom proposed by John Dewey a half-century ago only recently have come to be widely understood and classroom tested. Foxfire schools in more than 20 states have transformed indifferent, unmanageable teenagers into highly self-motivated students whose effort and performance consistently exceed teacher expectations. Foxfire-sponsored teacher training and teacher support networks now operate in a handful of states.

Literally dozens of other educational leaders have promoted significant changes. There is a common theme among the many efforts and strategies: successful instruction requires individualizing and personalizing education in a way that develops intrinsic motivation so the habits of learning are internalized for a lifetime. There is a growing body of research and practice upon which schools and communities can draw for support and guidance in creating schools for the 21st century.

4. Attempts to improve schools face structural barriers.

Despite the best efforts of the men and women who work in America's schools, far too many children are missing out. Major impediments to equity and excellence result from the pervasiveness of mass production technologies and industrial age thinking. Far too much educational policy is based on unquestioned assumptions about what quality instruction looks like. Teaching to the test so as to conform with externally imposed standards all too often replaces essential learning. Boundaries between what goes on in the classroom and what happens in the community often deprive learning of its relevance. Students frequently remain the products of a factory-like process rather than the enabled and motivated learners the country needs.

Ted Sizer in "Horace's Compromise" describes how educational policy in the past several decades has been focused more on removing incompetence than on supporting excellence. Moreover, the centralizing effects of more recent educational policy statements (acceptance of curricula determined at ever higher levels, centrally imposed standards that ignore local strengths and weaknesses) have moved more of the decisions about the what, when and where of learning away from the student, the teacher, and the school toward the district and state departments of education. Likewise, school improvement mandates during the same time have discounted, or sometimes flat-out ignored, the accumulated wisdom of the experienced teacher and seasoned principal. Research by Linda McNeil has shown that centrally managed curricula have less relevance for both teachers and students than curricula devised at the school level.

School curricula conceived in the 19th century paradigm focus narrowly on verbal-linguistic and logical-mathematical dimensions. Teaching of abstract thinking is difficult to do in a system of fixed curricula, standardized tests, and large-group instruction based on textbooks. Trying to instill innovation and creativity in a culture of standardized curriculum is a futile task. Conventional academic disciplines create arbitrary divisions between subjects. Pressures to go "back to the basics" reinforce a very limited conception both of needed skills as well as intelligence and knowledge.

Teachers work in isolation with very little opportunity for collaboration among peers, very little flexibility and control over their working conditions. They have insufficient time and are given inadequate resources to renew and expand their skills or plan innovations for their classrooms. As a result many good teachers leave the profession.

School practices, especially assessment systems, discourage cooperation. Even worse, labeling and tracking rob students of different abilities the opportunity to learn from each other. School policies leave little room or encouragement for students to develop their own high internal standards. Students usually rely on grades and other external evaluation.

Measurement systems provide little or no understanding of what is really happening in schools. Though all but discredited as a valid measure, schools are still pushed into the practice of giving IQ tests the results of which influence expectations concerning students and thus their opportunities. Scholastic Aptitude Test (SAT) scores, whose validity now is in serious doubt, are used inappropriately as a measure of academic performance. Equally troubling is the inability of conventional testing to capture the rich spectrum of learning outcomes. And little to nothing has been done to measure the kind of learning that takes place outside the school.

Education departments in universities are structured in ways which limit their value to primary and secondary schools. Far too much of the money allocated to educational research is conducted in laboratory settings that has little or no relevance to the real world of school practice or focuses on trivial issues that have little practical benefits.

There is very little research and development money invested in education. As a result, efforts to improve schools can be made only after the ordinary business of the classroom is completed. Too often no time is built into the workday and/or school year for serious renewal and reflection. A commonly used metaphor among practitioners is that school improvement feels like trying to change a tire while traveling down the road at 60 mph. In industry, no one would consider trying to operate a plant while in the process of retooling. Yet, in education that's what those who want to implement change have to do.

There is a general lack of capital for investment in innovation, especially the acquisition of technology. There is a vast unmet need for technology in education to automate repetitive tasks and information processing needs (which frees up more teacher time) and for installing the technologies that personalize and empower both learners and teachers.

The foregoing list of structural barriers to school improvement is by no means an exhaustive list of the limitations and barriers to change. Such a list would fill an entire book. The bottom line, however, is that for real reform to occur there must be a fundamental change in power relationships so that the authority and responsibility for change gets centered in each local community. Equally important, all efforts must remain focused on teaching and learning relevant knowledge and skills.

5. A growing consensus agrees that removing structural barriers calls for more than just reform; it requires a fundamental restructuring of the system.

The roots of the restructuring movement within education can be traced back at least 40 years to the introduction of social systems theory in educational research. In the mid-sixties, the Kettering Foundation funded the Institute for the Development of Educational Activities and the League of Schools was formed to engage in formal self renewal. From this base have come a good many of the current leaders in school renewal and school-centered change, among them the National Center for Educational Renewal led by John Goodlad at the University of Washington.

The Effective Schools Movement helped popularize the idea of looking at the school as the basic unit of change and added political energy to decentralizing school policy.

Educational innovators generally recognize two levels of change: reform and restructuring.

Reform maintains the system's existing goals and structures, but modifies system components to achieve greater efficiency or quality of product. For example, selecting better text books, the introduction of bilingual and vocational education, modifying instructional requirements, and improving schedules to increase the amount of time learners spend on task were changes of this type.

Restructuring is more fundamental. Those who promote this type of change do not accept existing goals and structures, often either because they believe the system no longer produce a good product or because they question the assumptions on which the system operates. The kind of change they advocate involves new operating principles, new roles for participants, and new relationships among components of the education system and between schools and the communities in which schools operate. Examples include reducing the barriers between the world of learning and the "real world," giving students greater authority and responsibility for what and how they learn, giving each school greater autonomy to accomplish educational goals.

American schools have seen varying degrees of success with both types of change. What is clear, if not unique, about the 1990s is the number of those who are convinced the latter type of change, fundamental restructuring, now is necessary. Within the educational community there is a proliferation of coalitions and networks aimed at school restructuring. These include state sponsored initiatives, university partnerships and professional associations. Both major national teacher's unions, the National Education Association and the American Federation of Teachers, are active leaders in the movement.

Foundations likewise have supported studies which conclude fundamental change is necessary. The Twentieth Century Fund, The Carnegie Education Fund, the Metropolitan Life Foundation, the Council for Aid to Education, the W.T. Grant Foundation on Work, Family, and Citizenship are some examples.

Business led groups likewise call for fundamental changes. The members of the Business Coalition for Educational Reform--the Alliance for Business, the Business Roundtable, the Committee for Economic Development, the Conference Board, the National Association of Manufacturers, the National Association of Private Investment Councils, the U.S. Chamber of Commerce, and the U.S. Hispanic Chamber of Commerce--have sponsored study groups and issued reports calling for fundamental changes in the ways schools are structured and operate. All these groups agree that the solution is not to be found in making the mass-production system more effective. Rather, solutions must be found in a fundamental restructuring to enable innovation.

What changes do these groups call for? The "Essential Components of a Successful Education System" prepared by the Business Roundtable, is a good example of the changes called for.

ESSENTIAL COMPONENTS OF A SUCCESSFUL EDUCATION SYSTEM

1. THE NEW SYSTEM OPERATES ON THE BASIS OF FOUR ASSUMPTIONS.
 - A. ALL STUDENTS CAN LEARN AT SIGNIFICANTLY HIGHER LEVELS. GONE IS THE ASSUMPTION THAT A PRESCRIBED PROPORTION MUST FAIL.
 - B. WE KNOW HOW TO TEACH ALL STUDENTS SUCCESSFULLY. WE NEED TO IDENTIFY SUCCESSFUL PRACTICES AND THEN TRAIN ALL SCHOOL STAFF IN THE REQUISITE KNOWLEDGE AND SKILLS.
 - C. A RIGOROUS AND CHALLENGING CURRICULUM SHOULD LEAD TO HIGHER ORDER THINKING, PROBLEM SOLVING, AND INTEGRATION OF KNOWLEDGE. HOWEVER, HOW WE TEACH, WHEN AND WHERE LEARNING OCCURS, AND WHO TEACHES DIFFERS FOR DIFFERENT STUDENTS, TEACHERS, AND COMMUNITIES.
 - D. EVERY CHILD MUST HAVE AN ADVOCATE. IF NATURAL FAMILIES CANNOT FILL THIS ROLE, OTHER INDIVIDUALS MUST BE FOUND.
2. THE NEW SYSTEM IS PERFORMANCE BASED. SUCCESS IS MEASURED BY WHETHER LEARNERS HAVE THE KNOWLEDGE AND SKILLS NECESSARY TO MEET THE CIVIC, ECONOMIC, AND SOCIAL CHALLENGES OF THE NEXT CENTURY--NOT BY THE COST OF INPUTS OR HOW HARD PEOPLE TRIED.

3. ASSESSMENT STRATEGIES MUST BE AS STRONG AND RICH AS THE OUTCOMES. TESTS AND OTHER ASSESSMENT STRATEGIES MUST REFLECT AN EMPHASIS ON HIGHER EXPECTATIONS CONCERNING PERFORMANCE--THINKING AND INTEGRATION OF KNOWLEDGE, UNDERSTANDING MAIN IDEAS, AND PROBLEM SOLVING. WE MUST ABANDON LESSER STRATEGIES--E.G., THOSE EMPHASIZING RECALL OR RECOGNITION ABILITIES.
4. SCHOOL SUCCESS IS REWARDED AND SCHOOL FAILURE IDENTIFIED. A SYSTEM BUILT ON OUTCOMES REQUIRES REWARDS AND PENALTIES. THE SCHOOL'S PERFORMANCE IS THE UNIT OF ASSESSMENT, NOT INDIVIDUAL TEACHERS. THE STANDARD OF COMPARISON IS THE SCHOOL'S PREVIOUS PERFORMANCE. THE FORM AND CONTENT OF SANCTIONS MUST BE DIRECTED TO IMPROVING A SCHOOL'S ABILITY TO DO BETTER AND SHOULD NOT BE PUNITIVE.
5. SCHOOL-BASED STAFF HAVE A MAJOR ROLE IN MAKING INSTRUCTION DECISIONS. IT'S UNREASONABLE TO HOLD SCHOOL STAFF UNACCOUNTABLE IF THEY DO NOT HAVE THE AUTHORITY AND MEANS TO ACT. THIS MEANS SCHOOL STAFF HAVE A SAY IN DECISIONS ABOUT HIRING AND FIRING, CURRICULUM, INSTRUCTIONAL PRACTICES, DISCIPLINARY MEASURES, THE SCHOOL'S CALENDAR, STUDENT AND TEACHER ASSIGNMENTS, AND SIMILAR ISSUES.
6. MAJOR EMPHASIS IS BASED ON STAFF DEVELOPMENT. BECAUSE SCHOOL PERFORMANCE DEPENDS ON STAFF QUALITY, SCHOOL SYSTEMS MUST ADEQUATELY PREPARE STAFF.
7. A HIGH-QUALITY PRE-KINDERGARTEN PROGRAM IS CRITICAL, AT LEAST FOR ALL DISADVANTAGED FOUR-YEAR OLDS. RESEARCH INDICATES SUCH PROGRAMS HAVE A POSITIVE IMPACT ON LATER SCHOOL PERFORMANCE AND SUCCESS IN LIFE.
8. HEALTH AND OTHER SOCIAL SERVICES ARE SUFFICIENT TO REDUCE SIGNIFICANT BARRIERS TO LEARNING. EDUCATION IS WORK, AND THE CONDITIONS NEEDED FOR SUCCESSFUL EFFORT ARE NO LESS IMPORTANT IN THE LEARNING ENVIRONMENT THAN IN THE WORKPLACE.
9. TECHNOLOGY IS USED TO RAISE STUDENT AND TEACHER PRODUCTIVITY AND TO EXPAND ACCESS TO LEARNING.

Other change advocates add another essential component: students must take on ever-increasing responsibility for their own learning. They eventually become self-motivated and self-evaluating. Others would give parents a greater say in what occurs in the classroom along with greater responsibility for both supporting schools and promoting learning during out-of-school hours. Others suggest breaking down strict barriers between schools and the community by taking learning outside classroom walls (e.g., service, apprenticeships) and bringing the community into the school (e.g., studying community issues, using community leaders as instructional resources).

Whatever emerges as essential components for 21st century schooling, it should be recognized that successful restructuring will not come from following a fixed formula. There is no single model of the ideal school system--no off-the-shelf solutions that can possibly anticipate the needs of all learners and all communities. There is no one best student-teacher ratio, nor a common formula for amount of time for a prescribed subject, nor even what tests and assessments to use. On the contrary, a set of guiding principles inform how schools operate, the roles people play, and the relationships that should prevail to enable schools to prepare learners to be the citizens and workers this country needs.

6. The co-occurrence of restructuring in both education and business provides an opportunity for highly productive business-education collaboration.

The concepts underlying the Business Roundtable's Essential Components and similar calls for school restructuring should not be unfamiliar to business people. In the past 10 to 15 years leading firms have undergone an organizational restructuring of their own. Driven by foreign and domestic competition, firms have examined the mental models that influence the way they think about their mission, redefined their mission, and fundamentally modified their operations. IBM, Ford Motor Co., Citicorp, Digital Equipment Corporation, Johnson & Johnson, 3M, Hanover Insurance, and Polaroid are among the often cited examples.

The restructuring advocated for schools is similar to the organizational restructuring already underway in the business world. Common to both is recognition that:

- a. Excellence must be the norm.
- b. All participants, be they learners or workers, are assets. They come to their tasks open to challenge and capable of becoming able to perform at a high level.
- c. Success in promoting a high level of performance depends in large measure on adapting the learning or working environment to the learner/worker and not insisting that the learner/worker conform to a standardized environment.

- d. Success depends on participants sharing a common vision of what is to be achieved. Collaboration and cooperation are maximized. Competition pits individuals and work groups against their prior achievements not against one another.
- e. Individuals and work groups become self-directed requiring less and less supervision.
- f. Delegated authority and responsibility lead to an improved product. Administration is flatter. Top level administration relinquishes much of its traditional control.
- g. Authority based on competence and knowledge supplants authority associated with status.
- h. Goal accomplishment is rewarded.
- i. Rigid procedures are deadly. Flexibility is an essential element of successful adaptation.
- j. Today's solutions are tomorrow's problems. Surviving enterprises must have a built in mechanism for continual change and adaptation.
- k. Success depends not only on improving internal operations. It likewise depends on the enterprise, be it a school or a firm, understanding the external environment in which it operates.

The parallel developments--efforts at school restructuring and organizational restructuring in business--are striking and constitutes an extraordinary opportunity for both business and education. Seldom do leaders in both spheres have the ability to understand one another and the processes of change both are undertaking. Seldom do they recognize the potential for the kind of mutual benefits arising out of such collaboration. And seldom have both had the power necessary to bring about change in the country's schools.

Once before in this nation's history educational and business leaders cooperated to restructure schools. That collaboration positioned the nation to successfully meet the challenges of the Twentieth Century. The question remains whether business and educational leaders once again can collaborate to enable our schools to prepare learners for the century ahead.

BIBLIOGRAPHY

- Alder, M.J. The Paideia Proposal: An Educational Manifesto. New York Macmillan, 1982.
- Archimbaut, Reginal D., editor. John Dewey on Education: Selected Writings. New York: Random House, 1964.
- Barton, Paul E. and Irwin S. Kirsch. Workplace Competencies: the Need to Improve Literacy and Employment Readiness. Washington, D.C.: U.S. Department of Education Office of Educational Research and Improvement, 1990.
- Business Roundtable. Essential Components of a Successful Education System. New York: Business Roundtable, 1990.
- Carnegie Forum on Education and the Economy. A Nation Prepared: Teachers for the Twenty-First Century. New York: Carnegie Forum, 1986.
- Carnevale, Anthony P. America and the New Economy. New York: American Society for Training and Development, forthcoming.
- Carnevale, Anthony P., Leila J. Gainer, and Ann S. Meltzer. Workplace Basics: The Skills Employers Want. Alexandria, VA: American Society for Training and Development, 1989.
- Commission on the Skills of the American Workforce. America's Choice: High Skills or Low Wages! Rochester, NY: National Center on Education and the Economy, 1990.
- Dagget, Willard. "Employment's Challenge to Education," Oregon Business, March 1991, pp.18-27.
- Edmonds, Ronald, "Making Schools Effective," Social Policy, September-October 1981, pp. 56-59.
- Elmore, Richard F. Restructuring Schools: The Next Generation of Educational Reform. San Francisco, CA: Jossey-Bass Publishers, 1991.
- Goodlad, John I. A Place Called School. New York, NY: McGraw-Hill Book Company, 1984.
- Hollifield, John. "Restructuring's Great Promise: Improved Student Outcomes," Doubts and Certainties, V, 6, February 1991, pp. 1-5.

Johnson, D.W., R.T. Johnson, E.J. Holubec, and P. Roy. Circles of Learning: Cooperation in the Classroom. Alexandria, VA: Edward Brothers, Inc., 1984.

McClure, Robert and Gary Obermeyer. Visions of School Renewal. Washington DC: National Education Association, 1987.

Meyers, Ellen and others, editors. The Teachers' Vision of the Future of Education: A Challenge to the Nation. New York: Impact II--the Teachers Network, 1991.

National Center for Education and the Economy. America's Choice: High Skills or Low Wages! Rochester, NY: NCEE, 1990.

National Commission on Excellence in Education. A Nation at Risk. Washington, D.C.: U.S. Government Printing Office, 1983.

National Commission on Testing and Public Policy. From Gatekeeper to Gateway: Transforming Testing in America. Boston: National Commission on Testing and Public Policy, Boston College, 1990.

National Dissemination Study Group. Educational Programs That Work: A Collection of Proven Exemplary Educational Programs and Practices. Longmont, CO: Sopris West Inc., 1989.

Obermeyer, Gary and Nancy J. Lee. "Growing into Schools of the Future," Paper presented to the National Council of States on Inservice Education. November 1985.

Owen, David. None of the Above: Behind the Myth of Scholastic /Aptitude. Boston, MA: Houghton Mifflin, 1985.

Perry, Nancy J. and others. "Saving the Schools: How Business Can Help--Special Issue," Fortune, November 7, 1988.

Peters, T. J. and R. H. Waterman. In Search of Excellence: Lessons from America's Best Run Companies. New York: Harper & Row, 1982.

Reich, Robert B. "Metamorphosis of the American Worker," Business Month, November 1990, pp.58-62.

Reich, Robert B. The Work of Nations: Preparing Ourselves for 21st Century Capitalism. New York, NY: Alfred A. Knopf, 1991.

Rutter, Michael and others. Fifteen Thousand Hours: Secondary Schools and Their Effects on Children. Cambridge, MA: Harvard University Press, 1979.

- Sarason, Seymour. Culture of the School and the Problem of Change. Boston: Allyn & Bacon, 1982.
- Sarason, Seymour. The Predictable Failure of Educational Reform. San Francisco, CA: Jossey-Bass Publishers, 1990.
- Schlechty, Phillip C. Schools for the 21st Century. San Francisco, CA: Jossey-Bass Publishers, 1990.
- Senge, Peter M. The Fifth Discipline. New York: Doubleday Currency, 1990.
- Sizer, Theodore R. Horace's Compromise: The Dilemma of the American High School. Boston, MA: Houghton-Mifflin, 1984.
- Stone, Nan. "Does Business Have Any Business in Education?" Harvard Business Review, March-April 1991, pp. 46-62.
- Toffler, Alvin. Learning for Tomorrow: The Role of the Future in Education. New York: Random House, 1984.
- U.S. Departments of Labor, Education, and Labor. Building a Quality Workforce. Washington, DC: U.S. Government Printing Office, July 1988.
- U.S. Office of Technology Assessment. Worker Training: Competing in the New International Economy. Washington, DC: U.S. Government Printing Office, 1990.
- Villaume, John M. The Foxfire Story. Franklin, West Virginia: The Woodlands Mountain Institute, 1991.
- Washington Education Association Task Force. Restructuring Public Education: Building a Learning Community. Federal Way, WA: Washington Education Association, no date.
- Wigginton, Eliot. Sometimes a Shining Moment: The Foxfire Experience. Garden City, NY: Anchor Books, 1986.
- Williams, Richard C. and others. Effecting Organizational Renewal in Schools: A Social Systems Perspective. New York: McGraw Hill, 1974.

II. BUSINESS EDUCATION PARTNERSHIPS STRATEGIC OPPORTUNITIES TO HELP ACHIEVE AMERICA'S NATIONAL EDUCATION GOALS

INTRODUCTION

In 1983, when the landmark report, "A Nation at Risk," was published there were approximately 40,000 business-education partnerships in the U.S. Today, there are estimated to be between 140,000 and 200,000. (1) A recent Fortune magazine survey cited 85 major corporations involved in a wide variety of K-12 educational renewal and restructuring programs ranging from contribution of \$100,000 to \$500,000 annually. The survey indicated that companies were beginning to view their educational contributions as long-term investments. (2)

In 1990, President Bush and the governors from the 50 states adopted six National Education Goals calling for public education reform, restructuring, and renewal. Business leaders nationwide are engaged in the debate about the purpose and goals of education and strategies for strengthening schools. Business-education partnerships are strategic opportunities to help achieve America's national education goals.

The purpose of this paper is to provide American Gas Association (AGA) members with an overview of the history, context, and types of business-education partnerships. The role gas companies can play and resources they can bring to public education are also discussed. Finally, the paper describes the elements of education restructuring, and the guiding principles of business-education partnerships based on experiences with these efforts over the past dozen years. These guiding principles provide the foundation for AGA's Education 2000 Strategic Plan.

HISTORY AND CONTEXT OF BUSINESS-EDUCATION PARTNERSHIPS

America's third deficit is education, alongside budget and trade. The effects of this education deficit are evidenced in both U.S. public schools and corporations. America is a culture in transition as the dramatic changes in school and the workplace over the past twenty years demonstrate. The dilemmas of the public schools and businesses are two sides of the same coin. Both point to the need for investment in human capital, the critical resource for survival in the 21st century.

Compared to students and workers in other industrialized nations, especially Western Europe and Japan, American students and workers are not well educated or trained and overall rank in the "bottom half." For example, in 1985 Motorola Corporation decided to open a new cellular manufacturing plant in the United State instead of building it offshore. They assessed workers at a Chicago plant whose workers were estimated to

be best suited for retraining in the technology. Only 40% passed a test containing question such as "ten is what percent of 100?" (3) As a nation at risk there is a need of a student population, workforce, and citizenry of critical thinkers who are technologically literate, skilled and experienced in working with teams, and able to adapt and thrive in an ever-changing environment.

Business-education partnerships have been one response to the double-edged dilemma. Over the past dozen or so years, thousands of business-education partnerships have sprung up across the country. Businesses entered into most of these partnerships with a sense of "fuzzy altruism" and limited involvement. The business community has become more aware of the necessity for better education and has become a visible player and stakeholder in American public education.

Although business has had some involvement historically in public education, business-education partnerships are relatively new territory for both business leaders and educators. Public-private collaborative ventures have a very limited history in the U.S. This is not the case in western Europe and Japan which have long, substantive histories of partnerships among business, labor, education, and government, clearly a competitive advantage in the 1990s. The relationship between public education and training in the workplace is coordinated in nations where public/private partnerships have a prolonged history.

When a Japanese high school graduate goes to work for a manufacturing company it costs about one dollar to bring its new employee up to speed on the techniques of statistical process control (SPC). For an American high school graduate in a similar situation it costs the company \$200 for the same training, and \$2500 if the student does not have the basic math training required. (4) The rapid changes of the international economy challenge American business and schools to forge and deepen their strategic alliance to help survive in the global marketplace, maintain an established standard of living, and revitalize schools as places that prepare youth for the future.

Most business-education partnerships to date have been characterized as "helping hands" relationships or "feel good" projects with no strings attached and a short-term commitment from business. These include teacher recognition programs, scholarships and awards, mini-grants, donations, speakers, and curriculum materials.

The good intentions and worthwhile outcomes of these efforts are appropriate starting points for business leaders and educators to learn about each other and build a foundation of trust and mutual respect needed for more complex partnerships aimed at systemic improvement and policy change. Business leaders throughout the country have begun to provide leadership in the education reform and restructuring movement. Business-education partnerships are joint ventures of business leaders, parents, teachers, and communities working together to revitalize American education. These efforts are growing from short-term, public relations efforts to long-term collaborations geared to institutionalizing policy and systemic change in public education.

Examples of Business-Education Partnerships

The following are examples of a three successful partnerships:

South Carolina: Business involvement was critical to the passage of two statewide reform initiatives providing incentives for school-site restructuring, grants for parenting education from birth to age five, and developing curriculum for higher-order skills. Included a one-cent sales tax increase to fund restructuring efforts.

Boston Compact: The core of the Compact is a written agreement between the schools and the business community creating a wide range of employment and education initiatives including the promise of jobs after graduation.

Miami-Dade County: Approximately half of the county's schools have converted to a school-based management and shared decision making process. Other elements of the effort include: higher teacher salaries, career ladder program, summer school, Saturday morning school, and child care until 6:00 pm.

TYPES OF BUSINESS-EDUCATION PARTNERSHIPS

The Committee for Economic Development (CED) organizes business-education partnerships into stages. (5) The stages span the following efforts:

Stage 1: Helping Hands Relationships.

Business provides tangible goods and services to schools such as equipment, donations, mini-grants, speakers, and curriculum materials. These efforts support or enhance existing school programs. More than half (52%) of the business-education partnerships in America today are helping hands relationships. (6)

Stage 2: Programmatic Initiatives.

Business attempts to change or improve one particular school or program. Academies (schools within a school), adopt-a-schools, mentoring programs, employee volunteer programs, and management programs for administrators are the most promising and prominent of these efforts.

Stage 3: Compacts and Collaborative Efforts.

Joint efforts between several businesses and community organizations and one school district. These efforts are coordinating mechanisms of two types: a) supporting internally-driven school improvement efforts; b) ventures oriented towards creating effective external pressures to drive school reform efforts.

Stage 4: Policy Change.

Business leaders and community organizations work together in developing new policies primarily at the state level. (7) These policies might be concerned with providing basic school restructuring and reform or stabilizing school financing.

The results of the recent AGA Education 2000 Survey show that there is a great deal of activity in Stage 1, Helping Hands. For example, 90% of reporting companies provide speakers for school presentations, and 80% distribute curriculum materials to schools. There is also considerable activity in Stage 2, Programmatic Initiatives. Fifty eight percent of the responding gas companies that responded participate in adopt-a-school programs, and 54% provide summer internships for teachers and students. There is less activity at Stage 3, Compacts and Collaborative Efforts. Fifty nine percent of the companies participate in partnership programs with other groups or businesses. At Stage 4, Policy Change, there is less activity. Thirty six percent of respondents said they support education reform legislation at the state or federal level.

We recommend A.G.A. use CED's typology focusing on the stages of partnership development for discussing Education 2000 partnerships. This typology provides a framework for each local gas company to "grow" a partnership beginning at the level most appropriate for the organization, based on their past history with schools and on the state and local environment. Helping hands relationships and programmatic initiatives are safe, first steps in building a long-term, future-oriented compacts and collaborative efforts.

Another way of looking at business-education partnerships has been developed by the National Alliance of Business (NAB). It relates the type of partnership activity to the amount of commitment required and the likely impacts. As this schema shows, there is increased impact on the educational system with increased commitment by business. Policy and systemic changes both require more sustained commitment and also have the highest potential payoffs. Each gas company needs to evaluate its level of commitment and expected outcomes for the level of involvement it decides to undertake.

(See Table 1)

Table 1

PARTNERSHIP ACTIVITIES AND LEVELS OF COMMITMENT AND IMPACT

<u>Level</u>	<u>Partnership Activity</u>	<u>Committment</u>	<u>Impact</u>
1.	Policy	High	High
2.	Systemic Educational Improvement	High	High
3.	Management	Medium	Medium
4.	Teacher Training and Development	Medium	Medium
5.	Classroom	Low	Low
6.	Special Services	Low	Low

Source: Adapted from "The Fourth R, Workforce Readiness, National Alliance of Business, 1987.

Another distinct type of business-education partnership gaining prominence across the country is providing literacy and skills training in the workplace. Businesses are developing training partnerships with community colleges, unions, and universities to provide GED certification, skills training, adult basic education, and job retraining for workers. Recognizing that three-quarters of the workforce for the year 2000 is already working today, business-education partnerships enable the the current workforce to be more productive and flexible.

Training partnerships will continue to play a critical role in upgrading the skills of the current workforce and in restructuring businesses as learning organizations. Developing business-education partnerships with the local public schools (K-12) or with community colleges for worker training are separate, but related and complementary efforts. Much of what is involved in planning, implementing, and evaluating partnerships for K-12 education is applicable to partnerships aimed at training the current workforce, and vice versa.

WHERE GAS COMPANIES FIT IN: ROLES AND RESOURCES

There is a recurring theme among organizations taking a lead in business initiatives in public education: The Business Roundtable, National Alliance of Business, Committee for Economic Development, National Partners in Education, Jobs for the Future, and the Institute for Educational Leadership. These organizations concur that the next wave of business-education partnerships will focus on educational reform and restructuring at both the state and local level. Business leaders and educators also recognize that restructuring public schools is a more difficult than restructuring a business.

Roles and Resources

There are a variety of roles the local gas companies can play and resources they can provide depending on their expertise, orientation, and past experiences in the educational arena. The following list is a sampling of possible roles and resources:

Advocate and lobby for education reform at state and local level. Use political clout to lobby for education reform legislation, equitable and adequate school financing, higher teacher salaries, and to deregulate the educational bureaucracy.

Assist school districts in recruiting highly skilled graduates into teaching and loan personnel experts to schools for revamping recruiting programs.

Invite teachers to the workplace to better acquaint them with skills and knowledge needed in the changing work environment. Support teacher professionalization programs and efforts for renewing teachers and principals.

Work with educators at the state and local level to develop new accountability systems, goals, objectives, and standards.

Advocate for better asset management and improved tools for budgeting and decision-making.

Encourage and provide assistance for the study, training, and implementation of governance, management, and decision-making changes. Work with schools to assess training needed and provide it.

Encourage, advocate for and support risk-taking, innovation, excellence, and experimentation.

Encourage, advocate for, and support school-to-work transition and apprenticeship programs.

Encourage, advocate for, and support programs to meet the needs of disenfranchised children and youth.

Provide links between schools and employment and employment opportunities for graduates.

Work with the community to support a coordinated strategy linking education and social services.

Initiate and support research and development efforts for education.

Elements of Education Reform and Restructuring

Education reform and restructuring span a wide array of elements including:

School Based Management: structure decision-making closer to the student; allow for flexibility and accountability decentralized authority for school-based decision making; encourage innovation, risk-taking, excellence, and experimentation.

Professionalism: develop teachers with high standards and high level of professional competence and responsibility; provide meaningful staff development; improve teacher/administrator recruitment and preparation, management training.

Curriculum and instruction: accommodate different learning styles; balance the basics with skills needed for living in a more technological era; reexamine what is taught and why it is taught.

Accountability: develop new assessment tools and incentives; develop performance-based accountability systems for students, teachers, and administrators.

Linking education and social services: provide active support of pre-school and child care programs; assure comprehensive and coordinated health and social service delivery; provide programs for disenfranchised children and youth.

Finance: assure equitable and adequate funding for schools; support implementation of financial and budgeting decision-making techniques.

Infrastructure: improve asset management; assure investments in property, plant, equipment, and technology; provide better and more widespread use of up-to-date education technology.

GUIDING PRINCIPLES FOR BUSINESS-EDUCATION PARTNERSHIPS

Much has been written on the guiding principles and success factors for business-education partnerships ranging from helping hands relationships and programmatic initiatives to compacts and policy change efforts. Many of the guiding principles listed are the same principles and success factors that guide joint ventures between businesses. The following guiding principles have been gleaned from a wide variety of case studies.

Long term commitment is essential.

Successful partnerships acknowledge that there are no quick fixes, simple solutions, or one approach that works in all situations. The problems existing in public schools today did not happen overnight and cannot be resolved in a year or two.

Leadership is a driving force.

There is no substitute for personal involvement and the direction and backing of a company's CEO is imperative.

Patience, trust, mutual respect and benefits, listening, and time are the ingredients of success.

In many cases business and education speak different languages and do not have a sustained history of working together. It is important to recognize that institutional change is time-consuming. Frustration over the amount of time required for partnership efforts and with the educational bureaucracy, coupled with resistance to change, is commonplace. Cultivating patience, trust, and mutual respect and benefits set a foundation for success.

Coalition-building is primary.

Successful efforts are driven by a community coalition of diverse perspectives. This is not "lone ranger" territory. Each partner needs to be equal and feel ownership. It is valid for each partnership to see something in the partnership for themselves. An ongoing structure for the partnership needs to be developed.

Vision and goals are keystones.

Community-driven vision must be translated into practical objectives. This includes the need to plan strategically and clearly identify both short and long term goals for both the partnership and the schools. A written, signed statement of purpose, goals, objectives, guiding principles, assumptions, commitments, and expectations has been identified a critical factor in making partnerships work.

Build a knowledge base.

Each business getting involved in a partnership effort needs to establish a "comfort zone" by engaging in a learning process about public education at the local and state level and partnership efforts already underway locally and statewide. It is important to develop an awareness and sensitivity to the common ground and differences between public education and business.

CONCLUSION

The assembly line factory was the building block of industrial society. The learning organization is the building block of the knowledge society. Investments in human capital, in both education and business, are required to thrive in today's knowledge society. Business-education partnerships are strategic investments in human capital. As former New Jersey governor puts it, "When you put risk capital into a school you are not just investors with an eye to the bottom line. You are elders looking to the survival of the culture." (8)

the current climate of increased international competition, decreasing federal, state, and local financing for schools, and a recession combine to make restructuring schools a daunting, yet compelling task. As the relationship between public education and the international economy becomes clearer, more and more business, education, and government leaders are acknowledging the need and importance of the next wave of business-education partnerships---grappling with the tough issues of education reform and restructuring schools at the state and local level.

NOTES

- 1) The survey is provided in a special issue of Fortune magazine dedicated to education, entitled "Saving Our Schools," Spring, 1990, pages 91-106.
- 2) The numbers of partnerships have been cited in several publications listed in the Bibliography.
- 3) See "Motorola U.: When Training becomes an Education," Harvard Business Review, July-August 1990, p. 76.
- 4) See "Can Business Save the Schools?," Training, August, 1990, p. 19.
- 5) The Committee for Economic Development in American Business and the Public School: Case Studies of Corporate Involvement in Public Education describes three categories of partnerships:
 - 1) sharing resources with schools (donating funds or equipment for project);
 - 2) sponsoring employee participation programs in schools;
 - 3) participating in policy change at state or local level relating to finance, management, or human resource development.

Cynthia Shelton in The Doable Dozen describes 12 types of partnerships: applied business experience, career awareness, increasing company employees' understanding of the schools, curriculum enhancement, donated equipment/fund raising, scholarships, economic education assistance, job opportunities, motivation/morale building, parent involvement, professional development for teachers/staff, reciprocal services from schools, special student populations.

The Regional Laboratory for Educational Improvement in the Northeast and Islands in Business-Education Partnerships: Strategies for School Improvement describes partnerships by three stages of development:

- 1) support (establish relationship, contribute funds and equipment, create awareness, sponsor single project);
- 2) cooperation (work together to plan and implement a project, contribute staff, time, facilities and expertise as well as funds);
- 3) collaboration equal partners in all phases of activities, evaluate impact, sustain long term commitment, and provide reciprocal activities).

6 & 7) See Business Impact on Education and Child Development Reform, by P. Michael Timpane and Laurie Miller McNeill, Committee for Economic Development, advance copy February, 1991, pp. 8-22, for a complete description of the types of business-education partnerships.

8) See "Saving Our Schools," *Fortune*, Spring, 1990, p. 8.

BIBLIOGRAPHY

Business Roundtable. Essential Components of a Successful Education System. New York, New York: Business Roundtable, 1990.

Committee for Economic Development. Investing in our Children: Business and the Public Schools. New York, New York: Committee for Economic Development, 1985.

Committee for Economic Development. Children in Need: Investment Strategies for the Educationally Disadvantaged. New York, New York: Committee for Economic Development, 1987.

Committee for Economic Development. The Unfinished Agenda: A New Vision for Child Development and Education. New York, New York: Committee for Economic Development, 1991.

Conference Board. Beyond Business/Education Partnerships: The Business Experience. New York, New York: The Conference Board, 1988.

Fosler, R. Scott and Committee for Economic Development. The Business Role in State Education Reform. New York, New York: Business Roundtable, 1989.

Gordon, Jack, "Can Business Save the Schools?," *Training*, August, 1990.

Institute for Educational Leadership. Chicago Business Leadership and School Reform. Washington, D.C.: Institute for Educational Leadership, 1988.

Institute for Educational Leadership. Getting Down to Business: Next Steps in School Business Partnerships. Washington, D.C.: Institute for Educational Leadership, 1988.

Institute for Educational Leadership. Next Steps in the Relationship Between Business and Public Schools. Washington, D.C.: Institute for Educational Leadership, 1988.

Jones, John C. "Educating for the Third Millennium." Portland, Oregon: Association of Northwest Gas Utilities, June, 1990.

Kingsley, Christopher and Richard A. Lacey. A Guide to Working Partnerships. Waltham, Massachusetts: Brandeis University, 1988.

Kolderie, Ted, "Education That Works: The Right Role for Business," Harvard Business Review, September-October, 1987.

Levine, Marsha and Roberta Tractman. American Business and the Public School: Case Studies of Corporate Involvement in Public Education. New York, New York: Teachers College Press, Committee for Economic Development, 1988.

Martin, Robert L. Business & Education: Partners for the Future. Washington, D.C.: U.S. Chamber of Commerce, 1985.

McMullan, B.J. et al. Allies in Education, Volumes I and II. Philadelphia, Pennsylvania: Public/Private Ventures, September, 1987.

National Alliance of Business. A Blueprint for Business on Restructuring Education. Washington, D.C.: National Alliance of Business, 1989.

National Alliance of Business. America's Leaders Speak Out on Business-Education Partnerships. Washington, D.C.: National Alliance of Business, 1989.

National Alliance of Business. Business Strategies That Work: A Planning Guide for Education Restructuring. Washington, D.C.: National Alliance of Business, 1990.

National Alliance of Business. Corporate Action Agenda: The Business of Improving Public Education. Washington, D.C.: National Alliance of Business, 1990.

National Alliance of Business. The Business Roundtable Participation Guide: A Primer for Business on Education. New York, New York: The Business Roundtable, 1990.

National Alliance of Business. The Compact Project: School-Business Partnerships for Improving Education. Washington, D.C.: National Alliance of Business, 1989.

National Alliance of Business. The Fourth R Workforce Readiness: A Guide to Business-Education Partnerships. Washington, D.C.: National Alliance of Business, 1987.

National Alliance of Business. Who Will Do The Work?: A Business Guide for Preparing Tomorrow's Workforce. Washington, D.C.: National Alliance of Business, 1989.

Nussman, Bruce, et al. "Needed: Human Capital," Business Week Special Report, September 19, 1988.

- O'Connell, Carol. How to Start a School/Business Partnership. Bloomington, Indiana, Phi Delta Kappa Educational Foundation, 1985.
- Partners in Public Education. Guidelines to Effective School-Business Partnerships. Seattle, Washington: Partners in Public Education, September, 1989.
- Pennington, Hilary. Business-Education Partnerships: The Next Wave. Somerville, Massachusetts: Jobs for the Future, 1989.
- Perry, Nancy J., "Saving the Schools: How Business Can Help", *Fortune*, November 7, 1988.
- Perry, Nancy J. et al, "Saving our Schools", *Fortune* special issue, Spring, 1990.
- Regional Laboratory for Educational Improvement in Northeast and Islands. Business-Education Partnerships: Strategies for School Improvement. Andover, Massachusetts: The Regional Laboratory for Educational Improvement in Northeast and Islands, 1986.
- Reich, Robert B. "Metamorphosis of the American Worker", *Business Month*, November, 1990.
- Reich, Robert, B., "Teaching to Win in the New Economy", *Technology Review*, August-September, 1988.
- Reich, Robert B., "The Real Economy", *Atlantic*, February, 1991.
- Reich, Robert B. The Next American Frontier. New York, New York: Penguin Books, 1983.
- Reich, Robert B. The Work of Nations: Preparing for 21st Century Capitalism. New York, New York: Alfred Knopf, 1991.
- Shelton, Cynthia. The Doable Dozen: A Checklist of Practical Ideas For School-Business Partnerships. Alexandria, Virginia: National Community Education Association, 1987.
- Stone, Nan, "Does Business Have Any Business In Education?", *Harvard Business Review*, March-April, 1991.
- Sylvester, Kathleen, "The Strange Romance of Business and the Schools", *Governing*, April, 1991.

Timpane, P. Michael and McNeill, Laurie Miller. Business Impact on Education and Child Development Reform. New York, New York: Committee for Economic Development, to be published July, 1991.

U.S. Department of Education. National Goals for Education. Washington, D.C.: U.S. Department of Education, 1990.

U.S. Department of Labor et al. Building A Quality Workforce.. Washington, D.C.: U.S. Department of Labor, July, 1988.

Wiggenhorn, William, "Motorola U.: When Training Becomes an Education," Harvard Business Review, July-August 1990.

III. THE EDUCATION 2000 PROCESS A METHOD FOR LOCAL EDUCATIONAL CHANGE

INTRODUCTION

This paper outlines a method by which local gas companies in conjunction with community members, other businesses, and the schools can:

Assess their capability and degree of desired involvement in local educational change.

Develop a vision and local educational change strategy with the community.

Implement the local educational change strategy.

Evaluate the results of the local educational change strategy.

The Education 2000 Process for educational reform, restructuring, and renewal is a change process based on the assumption that successful educational change can occur only when people from the local community establish a vision of where they want to go, determine where they are now, and get involved in the process of making changes to get there.

Keystones of successful educational change include:

Vision.

Educational change is advanced by having a clearly defined road map. The vision must embrace a desirable outcome for people to "buy in." Educational change should be based on shared goals and principles and involve those whose commitment is needed for success: teachers, business leaders, unions, parents and administrators.

Participatory Decision Making.

Support for educational change increases when those who are affected by change are given the opportunity to influence the decisions and the way change is made. Educational change must honor the worth and dignity of individuals and their right to participate in decisions which affect them.

Educational change must be directed by a local partnership team, made up of representatives of the community, students, business, and school staff. This partnership team serves as a mechanism for: creating a vision for change; communication; problem solving; decision making; and, implementing agreed upon educational changes within the local system. Gas companies will be a part of this partnership team. The company may be the initiator of change or a participant in a change process already under way.

Local Change, Locally Created.

Educational solutions are specific and unique for each community. Communities improve the quality of their educational programs as they become skilled in selecting solutions that match their values, resources, and local circumstances. Educational change must recognize differences of opinion, value and attitude and deal with them constructively through open and honest communication.

Educational change must involve all voices and factions in the community since all are affected by community educational programs and all have potential contributions to make to these programs.

Process.

When people follow a systematic procedure for making choices and changes, resistance to change can be overcome and the community makes the best use of existing and/or new resources. Educational change must be planned if it is to be more desirable than unplanned change. Educational change recognizes that effective entry into a community and school system is a very sensitive process and needs to be based on a careful diagnosis of all available alternatives.

Comprehensiveness.

Because complex relationships exist between students and adults, between teaching and learning, and among schools, communities, and businesses, a comprehensive change strategy, not a parade of separate innovations, is needed.

Business-Education Partnership.

The gas company and other businesses recognize the mutual need and benefit of having a strong educational system and work together to make this happen. Educational change recognizes that an informed community is more likely to be a supportive community. Effective communication among schools, business and the community is essential.

If a planned educational change process is already underway in the community, the Education 2000 Process joins and reinforces it. More often, communities will need a catalyst to help create the vision for educational change and the community involvement necessary to implement the vision. The gas company and the Education 2000 Process can assist local communities to help themselves effectively initiate educational change.

THE EDUCATION 2000 PROCESS

The Education 2000 Process is an educational change process in which seven interlocking phases take place. Although the seven are part of a continuous process, it is convenient both for understanding and for keeping track of the process to picture it as consisting of these phases:

Phase 1: Assessing Gas Company Interest and Involvement

Phase 2: Getting Started

Phase 3: Assessing the Community

Phase 4: Creating a Vision

Phase 5: Planning for Action

Phase 6: Carrying Out the Plan

Phase 7: Assessing the Results:

Each phase is accompanied by a brief "Lessons from the Literature" section which reviews pertinent understandings learned from business-education partnerships over the last decade.

Phase 1: Assessing Gas Company Interest and Involvement (2-6 months)

What are our interests and involvement in education?

The local gas company conducts a self assessment which determines the company's interests in and commitment to local educational change concluding in the development of an Education 2000 Plan which specifies the company educational change objectives.

The process begins with the gas company taking a good look at itself and its educational involvement. What is it currently doing in education? Why? What are its concerns and values about education in its area (competent work force, viable economy, public service, etc.)? Who are the key players in the company concerning education? What are their

interests and commitments to educational change? How do we get "buy-in" to Education 2000? Are there existing educational change efforts? What are other parts of the business community doing about education? How can we make a difference?

The self assessment might use a multi-disciplinary company team to look at the company role in educational change. The team might focus on the following questions as it reviews company options:

Is the Education 2000 effort a serious one? That is, is the condition of education in our community important and fundamental enough to us to merit the effort? Will the effort be organized in a way to make a difference?

What are the common interests between quality education in our community and our long-term goals? What are the benefits to our company of becoming involved in educational change? What are the risks?

Is the effort action oriented? Can results and inputs be readily measured?

Can company efforts make an educational difference locally?

From this self assessment, the company develops an "Education 2000 Plan" that lays out objectives and an approach to follow that begins the wider, community process.

Lessons from the Literature:

Acknowledge that there are no quick fixes or simple solutions. Be prepared to stay involved for the long term.

Take an inventory of gas company strengths, weaknesses, and what it has to offer.

Establish a "comfort zone" where the company staff learns about what is involved.

Establish guiding principles and assumptions for partnerships.

Reassess the distribution of corporate contributions to education.

Phase 2: Getting Started (1-2 months)

Who should be involved?

In Getting Started, a partnership team (PT) is established which draws representatives from the community, gas company, other businesses, and the schools and begins to plan

the local Education 2000 Process.

Initially, community members agree to serve on a temporary PT. Members of this group establish criteria for selecting and recruiting members for the permanent PT. That is, they determine the stakeholders that ought to be represented on the PT to ensure community-wide participation. The initial PT then conducts a survey in the community to identify the spokespersons for these groups. Finally, the initial PT submits a report to the school board documenting progress.

As community members are forming the PT, school staff members examine what participation means for them and choose representatives to the PT, including selection of students. School board members and school and district administrators begin to examine their roles in the process, relate these roles to their present responsibilities, and examine ways they, as leaders, can support the process.

Lessons from the Literature:

Acknowledge that there is no substitute for personal involvement. Demonstrate commitment through appropriate CEO involvement.

Establish expectations for partners. Model leadership and vision.

Recognize that time, patience, trust, and listening are essential. Collaborate and work with others as a neutral convener and eloquent advocate.

Acknowledge that coalition-building is essential. Work with other companies as well as the community at large. Encourage other businesses to get involved. Ensure that partners are interdependent and that all sides see the benefits.

Help resolve "turf" conflicts which can jeopardize constructive educational change efforts. Establish a process to handle conflict and controversy.

Use company resources to leverage broader change.

Phase 3: Assessing the Community (1-2 months)

Where are we now?

Assessing the Community profiles local community demographics and outlines educational needs and efforts underway to address them.

A Community Assessment Team (CAT) is formed and conducts a preliminary community assessment with the assistance of local gas utility loaned executives. The CAT develops

a community profile and organizational capability assessment. This Community Assessment provides baseline information to circulate to the broader community.

As people begin to consider the need for more active participation in school planning, a local Process Facilitator (PF) assigned by or consulting to the local gas utility responds to inquiries and encourages careful assessment of community readiness to initiate a local educational change process. When it appears there is wide support "to do something," the process moves to Phase 4: Creating a Vision.

Lessons from the Literature:

Build a knowledge base for partnership efforts. Do your homework. Learn about public education and partnership efforts at the state and local level.

Develop an awareness of the differences and the common ground between the business and education sectors. Encourage equal partnerships where both education and business have "ownership."

Develop an ongoing structure for the partnership effort. Build on what has been learned. Don't re-invent the wheel.

Phase 4: Creating a Vision (1-4 months)

Where do we want to go?

During Creating a Vision the PT develops an appropriate educational change strategy to address identified educational needs. The educational change strategy may include a variety of improvement projects sequenced over time:

The first PT meeting is held to discuss group purposes, tasks and procedures. Group members then plan and conduct a more extensive "needs assessment" survey to elicit the community's sense of its educational needs. They then assemble and analyze the data from the draft survey, enabling them to set priorities and focus on the "most important" need. From this information they generate recommendations to the school board for an educational goal(s) or improvement project(s) to work toward.

During this phase, school staff and student members focus their attention on the school as an organization to determine how capable the organization is of supporting the changes the PT suggests. Students who are not on the PT may or may not become involved in these discussions and the problem-solving activities in which the school staff takes part. The school board reviews and confirms PT findings and approves or requests modification of the designated project. Additionally, the board begins to examine the task of policy formulation in relation to the Education 2000 Process.

Throughout the phase, school and district administrators take an active role in the survey and the school discussion sessions. At the same time, they encourage staff members and students to participate in these activities and begin planning their leadership responsibilities.

Lessons from the Literature:

Develop a vision for the partnership and for appropriate local educational change.

Assist communities to determine their priorities, agenda, and needs. Avoid dictating priorities or agendas.

Remind partners that each should see something in the partnership for themselves.

Create both short-term and long-term goals.

Promote clarity and consensus through company staff behavior.

Phase 5: Planning for Action (3-5 months)

How do we get there?

Plans for implementing and evaluating the educational change strategy and individual improvement projects are adopted during the Planning for Action Phase.

The PT organizes new working teams that include school staff members, students, administrators and community and business members. These teams develop detailed plans for implementing the educational change strategy and chosen projects and examine the implications and the feasibility of the project with students, staff, and community members so that those affected by the new program will be involved in the decisions about how it is planned, installed and evaluated.

Lessons from the Literature:

Recognize planning as a key component of success. Plan strategically and clearly identify goals.

Expect different levels of involvement in the educational change process.

Explore diverse approaches and perspectives; there is no one approach.

Translate broad vision into practical objectives.

Acknowledge that educational change is a process and not an end product.

Develop a written, signed, statement of purpose, goals, objectives and commitments.

Phase 6: Carrying Out the Plan (2-10 years)

How do we put the plan into action?

In Carrying Out the Plan the educational change strategy and chosen projects are implemented and evaluated according to plan.

The PT, school staff, students, administrators, and school board members participate in implementation or evaluation activities as specified in the plans. At regular intervals the progress of the project is reported to the community and the school board. Project plans are adopted and changed according to the evaluation findings.

Lessons from the Literature:

Take into account the reality of each situation in carrying out the plan.

Demonstrate the political will to achieve change in the community or state.

Stay the course for the long-haul.

Phase 7: Assessing the Results; Making Course Corrections (Ongoing)

What are we learning? What changes do we need to make? Are we getting there?

The Education 2000 Process is a learning process. Evaluation, feedback and course corrections are essential parts of the change strategy.

PT members synthesize reports on implementation and evaluation activities and prepare a report summarizing the outcomes of the project to date. School staff members, students, administrators, and PT representatives from the community contribute data to the PT concerning the effectiveness of the Education 2000 Process. The PT uses this information to assess the effectiveness of the process and recommends to the school board what changes are needed to meet the goals of the project.

Lessons from the Literature:

Ensure stability. Do not spin off successful programs too soon.

Institutionalize the process of change, not the programs or activities.

Learn as you go. Evaluate early efforts and build on the successes and correct the problems.

IV. THE A.G.A EDUCATION 2000 SURVEY

INTRODUCTION

To obtain benchmark information about education activities in member companies, the A.G.A. conducted a mail survey of all its companies. Surveys were sent to all CEOs of member companies with follow-up questionnaires sent to staff members who had been identified as having responsibilities for education. A total of 105 completed responses were received, a 42 percent response rate.

The survey shows that there is considerable education activity in reporting member companies. For example, 71 percent of companies budget for public education programs and half of the companies had staff assigned to education. The average budget was \$62,617 and most frequently a company would have one person responsible for the company's education activities.

Although 78 percent of companies reported they believed there were some difficulties with education, only 18 percent felt these problems were serious; about the same number who felt schools were "generally ok." Most companies (85 percent) felt they had some responsibility for education.

The majority of activities that A.G.A. companies said they participated in can be considered "helping hands" activities. Relatively few companies participate in high impact and higher involvement programs such as compacts, collaborative efforts and policy change. Furthermore, the few companies who responded to a question about what they believed to be the most effective ways of improving education pointed to "helping hands" types of activities.

Overall, the survey shows some activity in a substantial percent of reporting member companies. This activity tends to be of the low commitment, low impact type. There does not seem to be a strong sense of urgency about education in the member companies.

GENERAL INFORMATION

Number companies sent survey:	250
Number completed responses received:	105
Percent received:	42%
1. Companies budgeting for public education programs.	71%
2. Total 1990 budgets for education. (includes \$1.5 million by Con Edison)	\$6,078,260
3. Average budget (excluding Con Edison).	\$62,716
4. Budget range (excluding Con Edison).	\$1,000 - \$800,000
5. Number of employees whose principal assignment is education (not including internal training).	146
6. Number responding companies with education employees. Percent of responding companies with education employees.	50 48%
7. Average number of education employees per company. (excluding Atlanta Gas & Light Co. which reported 30 employees).	2.4
8. Most frequent number of education employees per company (mode).	1
9. Percent of companies with an educator advisory committee composed of educators outside the company.	25%

A capsule summary is that 7 of 10 responding companies had budgets for educational programs; half had one (sometimes two or three employees) devoted to education concerns, and an average budget of \$63,000.

10. Statements regarding Education 2000:

My company has heard about A.G.A.'s Education 2000 Initiative	88%
My company is participating in Education 2000	49%
My company would like to be actively involved in Education 2000	32%

EDUCATION INFORMATION:

11. Companies' view of the status of public education in their areas.

	#	%
Public schools are generally ok	18	17%
There are some difficulties	60	57%
U.S. public schools are in serious trouble	19	18%
Not sure	8	7%

Comment: About as many responding companies believe schools are in serious trouble as those who believe they are generally ok.

12. Companies' view of their responsibility for education improvement.

Not our responsibility	5	5%
(Somewhat our responsibility)	31	30%
An important concern for our company	54	51%
Not sure	15	14%

Comment: Fully half of the responding companies feel education "is an important concern for our company."

13. Groups to whom A.G.A.'s Education 2000 initiatives should be targeted. (in priority order)

1. Students
2. State/national education leaders
3. School administrators
4. Teachers
5. Parents/families
6. Business community
7. Disadvantaged youth

EDUCATION AS A COMPANY PRIORITY

14. Level of commitment companies/A.G.A. should place on the Education 2000 strategic planning priorities.

Hi Companies/A.G.A. should allocate resources to this area
 Med Companies/A.G.A. must weigh this against other priorities
 Lo This is not/should not be a priority commitment

	<u>Hi</u>	<u>Med</u>	<u>Lo</u>
a. Promote model A.G.A. member company actions that help improve the quality of the nation's education system.	60%	33%	5%
b. Develop and support partnerships with allied organizations to develop initiatives that help achieve national education goals.	52%	41%	5%
c. Support government initiatives that help achieve national education goals.	52%	36%	10%
d. Support the rights of all students to a quality education.	51%	34%	11%
e. Contribute to the development of a world-class education system in the United States and shape public opinion in support of this action.	48%	42%	8%
f. Assist national efforts to reduce the number and impact of educationally disadvantaged children.	39%	47%	11%
g. Promote communications between educators and the people they serve.	37%	47%	13%
h. Stimulate active and retired natural gas industry employees and their families to actively support efforts to improve the quality of education in their local schools	36%	48%	14%

Comment: The three high priority activities are:

- Promoting model programs.
- Developing partnerships.
- Supporting government initiatives.

15. Educational activities in which companies participate.

The activities are organized according to the four stages of business-education partnership developed by the Committee for Economic Development.

Stage 1: Helping Hands Relationships

1. Provide speakers for classroom/school presentations	90%
2. Distribute A.G.A. and/or other curriculum materials to teachers/students	80%
3. Conduct field trips for teachers/students	59%
4. Develop materials to distribute to teachers/students	52%
5. Provide student scholarships	49%
6. Provide equipment/new technology to classrooms/schools	48%
7. Make company facilities available for educational activities	43%
8. Support programs for disadvantaged youth	38%
9. Offer incentives and recognition to outstanding educational efforts	31%
10a. Offer company employees paid release time to participate in educational activities	31%
10b. Offer company employees <u>unpaid</u> release time to participate in educational activities	7%
11. Support pre-school programs to prepare children to learn	10%
12. Sponsor after school programs to help students stay in school	12%

Stage 2: Programmatic Initiatives

13. Participate in adopt-a-school programs(s) or school partnerships	58%
14. Encourage/provide leadership to increase business involvement in education	57%
15. Support employee volunteer programs for classrooms/schools	56%
16. Provide summer internships for teachers/students	54%
17. Support school fund-raising efforts	50%
18. Provide work-study opportunities for teachers/students	44%
19. Conduct teacher workshops to improve knowledge/skills	38%
20. Encourage parents to be more involved in classrooms	35%
21. Provide professional support to school district planning/operations	30%

Stage 3: Compacts and Collaborative Efforts

22. Encourage employee involvement in education committees/boards	73%
23. Participate in partnership programs with other groups or businesses	59%

Stage 4: Policy Changes

24. Support education reform legislation at the state or federal level	36%
--	-----

Other: (Internal to gas company)

25. Consider outside educational activities in employee evaluations	15%
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Comment: The majority of activities that AGA responding companies participate in are "helping hands relationships." Relatively fewer companies participate in higher impact programs (compacts and collaborative efforts and policy change).

16. Programs believed to be the most effective in improving the quality of local education.
(top four)

- | | |
|---|-----|
| 1. Participate in adopt-a-school programs or school partnerships | 29% |
| 2. Other programs | 19% |
| 3. Distribute A.G.A. and/or other curriculum materials to teachers/students | 10% |
| 4. Provide speakers for classroom/school presentations | 9% |

Comment: Although this question had a low response rate, those who did respond indicated they believed that early stage (low impact activities) as being the most effective way of improving education.

17. Initiatives companies would like A.G.A. to undertake at the Association level to support companies' education reform programs. (in priority order)

- | | |
|--|-----|
| 1. Serve as industry clearinghouse on effective programs | 76% |
| 2. Support national education reform legislation | 55% |
| 3. Other | 54% |
| 4. Build national education reform partnerships with business, government, education and other organizations | 52% |
| 5. Industry/external communications | 49% |
| 6. Promote successful industry education reform initiative | 46% |
| 7. Hold industry conference on education reform strategies | 38% |

Comment: There was high interest among respondents for two types of A.G.A. activities:

1. Clearinghouse, conferences and communications.
2. Supporting national educational reform legislation, building partnerships, and promoting reform.

AGA

Mon. 10-28

noon

Satellite hookup to hotel in San Diego, CA

intro POTUS: Michael Baly; Pres. AGA
[Bailey] → pron.

≈ 5 min. remarks

≈ a few Q & A (2 questioners)

2 questions per Paul → see proposed script

~~Mc Cormick~~

dais: Farman

Mc Cormick

Baly

EDUCATION

Exchange

A publication of the American Gas Association

A.G.A. Launches "Education 2000"

Building on its historical commitment to education, the American Gas Association has pledged a new decade of active support with a far-reaching program to help U.S. schools regain their educational excellence. The new program marks the first time an entire U.S. industry has committed its resources to the educational reform goals set last year by President Bush and the nation's governors.

A.G.A. launched its program, "Education 2000: The Natural Gas Industry's Campaign for Educational Excellence," at a National Press Club announcement in Washington, D.C., on August 30. Peggy Dufour, special assistant to Energy Secretary James Watkins, and Betsy Brand, assistant secretary at the Department of Education, joined in the announcement made by A.G.A. President George H. Lawrence and Vice Chairman John H. Croom. Simultaneously, many A.G.A.



A.G.A. Vice Chairman John H. Croom responds to reporter questions following the National Press Club announcement.

member companies across the country declared their support and participation.

"Education 2000" summons the natural gas industry to build on its traditional educational activities and renew efforts in local and state programs to improve education. The program was initiated by a Resolution on National Education Goals, which the association's Board of Directors adopted in early August. The resolution asserts A.G.A.'s new decade of commitment, reasoning that the educational crisis threatens the industry's future competitiveness and work force needs (see "Resolution," page 3).

Says Vice Chairman Croom, who is also chairman, president, and chief executive officer of Columbia Gas System, Inc., "Businesses have legitimate concerns for the state of the education system. When these youngsters graduate, they will be our employees, our contractors, our customers—voters on matters crucial to our activities and involved in many other ways with the sound

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STAR Awards Honor Science Teachers	7



A.G.A. President George H. Lawrence comments to Peggy Dufour, special assistant to Energy Secretary James Watkins, and Betsy Brand, assistant secretary at the Department of Education.

conduct of our business."

Many gas companies already support education in their communities. Their activities include adopt-a-school programs, teacher achievement awards, and the distribution of instructional materials. But, says President Lawrence, "A.G.A. is encouraging member companies to take an even more comprehensive view of their role in local education needs."

Through "Education 2000," the association is urging members to take a number of initiatives over the next 10 years. These range from offering field trips and summer employment to providing renewable college scholarships in teacher education. Member companies are being encouraged to build coalitions with other businesses, to create business forums for assessing educational opportunities, and to form alliances for building new educational institutions. Companies are also being asked to support innovative educational practices, appropriate legislation, and volunteer service by employees. A new program at Croom's Columbia Gas, for example, will let employees spend a few hours each month, with pay, volunteering in school activities.

Lawrence stresses that A.G.A. is seeking "a top-level, corporate commitment from member companies, rather than a business-as-usual approach." Toward this end, the association has formed a task force of CEOs and charged them to identify new applications of the "Education 2000"

concept. Croom will lead the task force, with William M. Warren, Jr., serving as vice chairman. Warren is president and chief operating officer of Alabama Gas Corporation, as well as chairman of A.G.A.'s Consumer and Community Affairs Committee.

Croom notes that the objective of "Education 2000" is not to tell educators what to do but to work actively for the attainment of national education goals. A.G.A. and its member companies can make a unique contribution to this effort, he says. "Our offices and operations blanket the country, with employees in communities large and small. Few industries," says Croom, "are better positioned to work effectively with educators in their communities and to support corrective programs as they evolve."

"The industry-wide approach to this is what's so significant," says Education Assistant Secretary Brand. "Because it's such a broad-scale effort, we're very excited about it." "And it could not come at a better time," adds Energy Assistant Dufour, "because it's being met with groundbreaking efforts at the federal level."

For its part in "Education 2000," Lawrence explains, "A.G.A. will do what an association does best. We will act as a clearinghouse and coordinator for the ideas that promote successful education programs and outreach efforts. We will also serve as the industry's national representative in partnerships with government, business, community, and educational organizations."

"Our industry," says Croom, "can make a powerful contribution to the national priorities of energy security, environmental improvement, and economic competitiveness. But the key to our contribution is educational excellence. We look to 'Education 2000' to help us realize these objectives." ☆

EDUCATION 2000

DOE Secretary Praises Scope and Content of "Education 2000"

Commenting on A.G.A.'s "Education 2000," Department of Energy Secretary James Watkins said, "I am pleased by its scope and content, and am pleased that such an important education initiative has come out of the energy segment of the corporate sector."

Last spring, Watkins unveiled his national science and mathematics education plan, calling it the key recommendation of the National Energy Strategy. Watkins said that DOE's ability to meet and solve its many pressing challenges depends as much on the availability of human resources as on financial or natural ones, perhaps more so. To meet this need, Watkins is using the resources of DOE, its federal and contractor employees, plus its national laboratories and research facilities to improve the nation's math and science education.

The DOE initiative is being spearheaded through its 43 national laboratories, which will offer technical assistance, encourage employee volunteer service, and develop cooperative programs. A number of activities are already under way, and others are being considered. One would use scientists waiting for security clearances,



Energy Secretary James Watkins says he's pleased that "such an important education initiative has come out of the energy segment of the corporate sector."

A.G.A. Board of Directors Resolution on National Education Goals

Whereas, the future competitiveness of the natural gas industry is threatened by the critical state of the nation's educational system; and

Whereas, the future work force of the natural gas industry will be inadequately educated to meet the industry's human resource need; and

Whereas, the economic and social vitality of the communities served by the natural gas industry are being adversely affected by the quality of the educational services in those communities; and

Whereas, the ability of natural gas company customers to be informed and literate consumers depends on the quality of the educational system; and

Whereas, the natural gas industry has a historical commitment to the economic and social vitality of the nation;

Therefore, be it so resolved that the American Gas Association commits its resources to a decade of active support of the new national effort to reform America's Education System.

— Developed by the A.G.A. Educational Programs Subcommittee and the A.G.A. Education Advisory Council.
Adopted August 1, 1990.

which normally takes about 17 months, to teach or work in the laboratories of local schools.

Watkins also called for a massive public-private partnership to support the department's initiative. Several organizations have signed agreements with DOE to establish internships, equipment loans, research and training programs, and other projects in math and science. The groups include the National Aeronautics and Space Administration, the Appalachian Regional Commission, Gallaudet College, and several major U.S. corporations, including Xerox, Apple Computer, Hewlett-Packard, and the Mid-Atlantic Coca Cola Bottling Company.

Watkins notes that A.G.A.'s program "is the first comprehensive, nationwide education initiative sponsored by an energy association." The secretary was scheduled to appear at the press announcement of "Education 2000" but had to cancel to attend a Cabinet meeting. He extended his congratulations to all the program participants, saying, "I look forward to working with you to bring this impressive program to America's students." ☆

"EDUCATION 2000" IN ACTION

How A.G.A. members are helping American education become the world's best

Baltimore Gas and Electric Company

BG&E sees the protection of human resources as a bottom-line issue. Through a variety of programs, the company gets actively involved in education at every level, trying to ensure that schoolchildren have the skills to become successful members of the community.

In BG&E's Our Future Workforce program, employees team with instructors at Southern High School to teach a 24-session curriculum that helps bridge the gap between the worlds of school and business. Freshmen explore future career possibilities, sophomores study the relationship between jobs and higher education, and juniors examine ways to get a job and keep it. By the time they're seniors, students are prepared to make sound decisions in applying for jobs and college. The curriculum was developed by Baltimore City Schools, the Greater Baltimore Committee, and local businesses. Although employees from all backgrounds and professions join in the teaching, BG&E employees taught the pilot program for four years. Principal Sandy Sarantinos has cited Our Future Workforce for effectively preparing students for the world of work and increasing their chances of graduating.

BG&E has also helped Southern form a peer counseling program to offset the school's shortage of guidance counselors (four counselors for 1,600 students). Each year, 32 students from all grade levels are carefully selected and trained to help their schoolmates. "The peer counselors don't give advice," says BG&E Coordinator Ellen Lagasse. "They listen and help the person come to his or her own conclusion about what to do." So far, the program has helped hundreds of students with problems ranging from peer pressure to teen depression.

Various studies have shown that parent involvement is directly linked to how well a child performs in school. To get parents of students at

Hilton Elementary more involved in their children's education, BG&E teamed with the school to sponsor three parent workshops during the 1987-88 school year. In addition to providing resources, BG&E helped research topics and speakers, compile materials, secure prizes, and market and evaluate the workshops. Since 1987, the company has supported workshops at other schools, as well as at Hilton, where overall parent support has increased noticeably.

Contact: Betty L. Ferguson, director of education and volunteer services, Charles Center, P.O. Box 1475, Baltimore, MD 21203; (301) 234-5631.

Northern Indiana Public Service Company

NIPSCO believes corporations have a responsibility to be good citizens of the communities they serve. With one in five adults in Indiana functionally illiterate, the company finds the fight for literacy most important. Since 1988, NIPSCO has formed local partnerships to open four "literacy labs," two in Gary, one in South Bend, and another in Fort Wayne. The labs' primary tool is a computer-based program called the Principle of the Alphabet Literacy System (PALS). Through 100 hours of classroom training, with PALS and a certified instructor, high school students and adults learn to read, write, and even touch-type. At the end of 10 weeks, a participant's reading ability can increase as much as three grade levels. NIPSCO's literacy labs have given dozens of people the skills for higher education, better employment, and greater self-esteem. Says Gary Neale, president and chief operating officer, "If we expect to heal some of our social wounds and allow our communities to thrive, we must take an interest in how education is preparing our citizens and the work force of tomorrow."

Contact: Christine Combs, manager of corporate communications, 5265 Hohman Avenue, Hammond, IN 46320-1775; (219) 853-5200.

Columbia Gas System

Columbia Gas wants its employees, customers, and others to be prepared to make informed judgments on proposals for their school systems.

To create awareness of educational issues, the company is setting up an information-gathering network, developing speakers bureau material, and sharing information with customers through bill inserts and advertising.

To stimulate personal involvement, Columbia Gas is forming a release-time policy that lets employees use a few working hours each month to participate in school support activities. The talents of retired employees are being mobilized in the effort, and employees will be recognized for their educational contributions. Columbia Gas also plans to provide summer internships for teachers, form local coalitions to examine school conditions, and consult with schools in management areas such as strategic planning.

Contact: Bruce Quayle, director of educational programs, 20 Montchanin Road, Wilmington, DE 19807; (302) 429-5229.

Memphis Light, Gas and Water Division

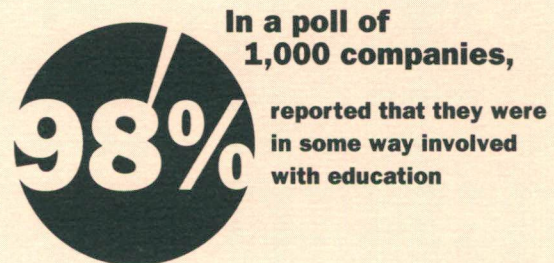
MLGW has long supported elementary and secondary education through numerous outreach initiatives. The division's adopt-a-school program, now in its eleventh year, includes a small-engine repair class that lets students work one day a week applying technical theory to real-life jobs. For those who qualify, the class can also lead to summer or permanent employment. In another adopt-a-school program, MLGW gives athletes both tutorial aid and incentives to improve academic performance.

Working with the Junior Achievement Organization, volunteers from MLGW give students in the classroom a practical look at the business experience. Volunteers introduce fifth and sixth graders to business basics, increase the economic and career awareness of eighth and ninth graders, and help juniors and seniors grasp applied economics.

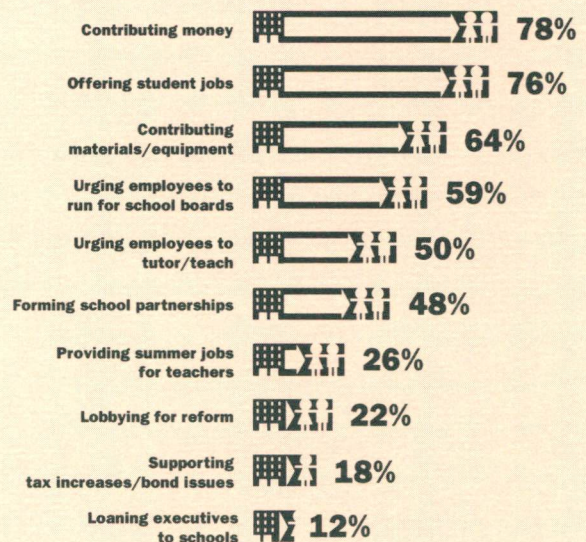
MLGW also offers a two-day Utility Camp to fifth and sixth graders. The overnight camp promotes career development and social interaction, provides positive role models, and helps the youths meet technical challenges.

Contact: Joyce M. Blackmon, vice president for development and external affairs, P.O. Box 430, Memphis, TN 38101; (901) 528-4011.

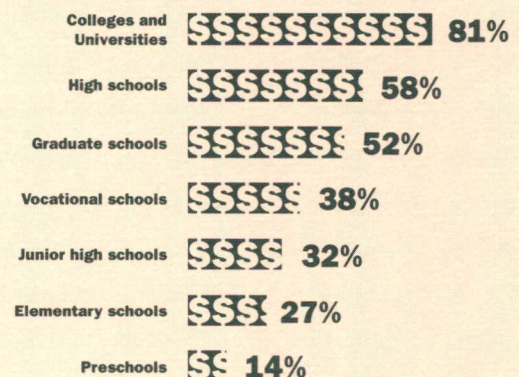
Businesses & Education



What are the companies doing?



Where are the contributions going?



Source: *Fortune* magazine, special spring 1990 edition, "Saving our Schools"

continued from page 5

Gas Company of New Mexico

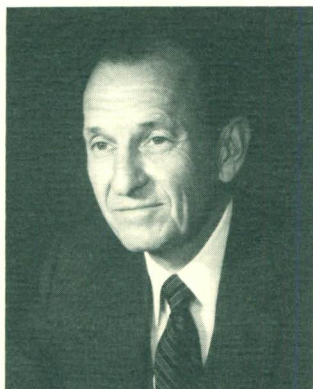
Gas Company traditionally supports educational projects in the communities it serves. The company is currently involved in a Teach the Children program, which provides clothes, books, and other school supplies to disadvantaged youths. As part of the Join A School program, Gas Company helps students fight drug abuse and encourages them to stay in school. The company also serves on a partnership council formed of schools and local businesses, and it supports a vocational training program for students not planning to attend college.

Many Gas Company employees volunteer their time to local schools. This year, Santa Fe employees will be given time off from their jobs to tutor elementary students voluntarily.

Contact: Bill Cella, Public Affairs Department, P.O. Box 26400, Albuquerque, NM 87125; (505) 889-8487. ☆

A.G.A. President's Message

Our Industry Can Set an Example for Others



A.G.A. President
George H. Lawrence

The critical state of our nation's education system is known to all of us. We hear about it on television, we read about it in articles like John Croom's *Public Utility Fortnightly* piece, and most of all, we see it in our youth. It is so serious that President Bush and the nation's

governors have called for "sweeping, fundamental changes" in the education system and have set

ambitious goals for our country.

Business has responded through individual corporate initiatives and through organizations like the Business Roundtable. Until now, however, no industry has collectively stepped forward to embrace a long-term commitment to educational excellence for the nation. Such a commitment is tailor-made for the American Gas Association and its members. That is why we are becoming the first industry, as a group, to declare its commitment to education by establishing "Education 2000: The Natural Gas Industry's Campaign for Educational Excellence."

A.G.A. is not a Johnny-come-lately to education. It has been an important part of our mission since the association's formation and has included many initiatives—from our long-standing distribution of curriculum materials to classrooms to our founding role in the National Energy Foundation. We've supported national literacy efforts and joined with our regulators in developing the first program to teach students about the issues involved in rate setting. Our community relations activities have attacked children-at-risk and school-dropout problems.

"Education 2000" builds on this long-standing commitment to and involvement in education. To help ensure its success, the program is being spearheaded by a task force of the A.G.A. Board of Directors. The task force is chaired by A.G.A. Vice Chairman John Croom, Chairman and CEO of the Columbia Gas System, Inc., and vice chaired by Mike Warren, President and COO of Alabama Gas Company.

Our natural gas industry can set an example for other industries to follow. For its part, A.G.A. will do what an association does best—that is, act as a clearinghouse for ideas that promote outreach efforts. The launch of this new quarterly publication, *Education Exchange*, is our first step in that direction. Many more steps will come. For now, we hope that the *Exchange* is useful to our members and informative to all involved in this critical national effort. ☆

A.G.A. STAR Awards Honor Nation's Science Teachers

Member companies of A.G.A. aren't alone in sponsoring programs to improve education. Each year, the association sponsors the STAR Awards program—for Science Teacher Achievement Recognition—in conjunction with the National Science Teachers Association (NSTA).

STAR awards recognize elementary and high school teachers who have developed new or highly effective programs in science education. A.G.A. presents the awards at NSTA's annual convention, and this year five educators were honored. The winners reflect the innovative efforts America's teachers are investing to raise their students' enthusiasm for science.

The top STAR award of \$1,000 went to **Thomas Altman**, a physics teacher at Oswego High School in Oswego, New York. In his program, "Physics Tests with No Answer Keys," Altman challenges students to find and repair mechanical or electrical problems in broken radio-controlled toy cars. Once the cars have been fixed, the students use them to demonstrate their understanding of inertia, velocity, aerodynamics, batteries and motors, radio frequencies, and other principles.

Science teacher **Henry Garvey**, of Kennedy Middle School in Woburn, Massachusetts, won the \$750 second-place award for "Science Education for Mainstreamed Special Needs Children Using the Cooperative Learning Model." Garvey's program teams learning-disabled and regular students into small groups to work on an earth science unit. The result is improved test scores and social interaction for both groups.

Three other teachers also received \$500 awards for their programs:

☆ **William Broniec**, chemistry teacher at J.I. Case High School in Racine, Wisconsin, won for "Bozo the Chemist: Clowning Around with Elementary Science," a traveling chemistry program aimed at elementary school students.

☆ **J. Marilyn Left**, fourth-grade teacher at Pinson Elementary School in Pinson, Alabama, won for "An Interdisciplinary Approach to Aerospace Education," which integrates the study of aerospace into the full curriculum.

☆ **Otto Phanstiel**, chemistry teacher at Stanton College Preparatory School in Jacksonville, Florida, won for "The Classroom Corporation Lab," which organizes applied physics students into "companies" that play different roles in solving a problem.

A.G.A., through its Educational Programs Department, is proud to sponsor in the STAR Awards. The 1991 awards will be presented next April at the NSTA convention in Houston, Texas. Deadline for application is November 15, 1990. For an entry form or more information, contact A.G.A. Educational Programs Manager Ray Volrath at (703) 841-8676. ☆

New Program, New Role for Education Advisory Council

In 1985, the American Gas Association formed an Education Advisory Council to review our energy education materials, recommend additions, and suggest improvements. Since then, council members—all educators from kindergarten through university—have been exceptionally helpful in making these materials more relevant and useful to students across the country. The council also advises on A.G.A.'s educational policies, but until now, its work in both these areas has dealt with energy education only. This summer, as A.G.A. adopted "Education 2000," the Advisory Council entered a new era of contribution.

Working with industry members on our Educational Programs Subcommittee, the council helped define our new policy and initiatives for "Education 2000." For the first time, these educators were advising on academic education in general rather than energy education alone. They brought to the planning table hands-on experi-

ence with current issues. And as the results show, their contributions were invaluable.

A.G.A.'s 10-year commitment to "Education 2000" means the planning and action have just begun. Educators around the country are still wrestling with what "reform" means and how it should proceed. Meanwhile, energy education helps solve other national problems, such as conservation and environmental protection, also vital concerns of the '90s. Clearly, the Advisory Council now has a dual role to play—bringing incisive perspectives to the broader educational issues as well as the energy-related ones.

We look forward to the council's future contributions and thank this year's members for all their hard work: Charles Arnold, Clark Elementary School, Erie, PA; Dr. Donald Bumpass, Oklahoma State University, Stillwater, OK; Violet Ewing, Graham Hill Elementary School, Seattle, WA; Melody Hall, Five Forks Middle School, Lawrenceville, GA; David Harbster, Chandler, AZ; Beth James, Madison High School, Vienna, VA; Connie Kostecka, Garfield Elementary School, Mentor, OH; Rita Morgan, Turlock School District, Turlock, CA; Cy

Pompier, Jackson Michigan School District, Jackson, MI; Jon R. Thompson, Kalamazoo Area Math & Science Center, Kalamazoo, MI. ☆

E D U C A T I O N **Exchange**

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The aim of the *Education Exchange* is to foster the sharing of information on educational issues and programs and to assist natural gas companies in their ongoing efforts to contribute to improving the quality of the U.S. education system.

Editor
Ray Volrath

Managing Editor
Phyllis Gross

Editorial Consultant
Linda Kinne

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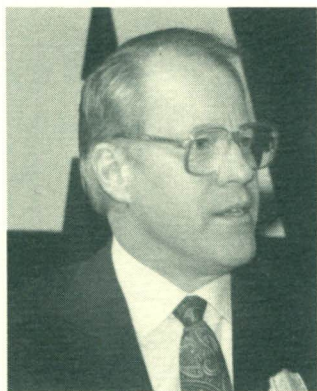
EDUCATION

Exchange

A publication of the American Gas Association

Industry Leaders Chart Course of Education 2000

Senior executives from natural gas companies around the country met in Washington, D.C., last December to shape the upcoming course of "Education 2000: The Natural Gas Industry's Campaign for Educational Excellence." Along with a mission statement and planning priorities, the new Education Committee adopted a first-year tactical plan and set up a task force to build a strategic plan for the 10-year initiative.



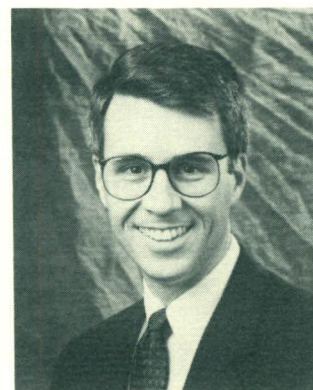
John Croom chairs new A.G.A. Education Committee.

Led by A.G.A. Vice Chairman John Croom, of Columbia Gas System, the committee was formed in early fall to ensure a high-level commitment to Education 2000. The A.G.A. initiative, launched last August, is the first industry-wide program specifically designed to support the nation's new educational reform goals. Says Croom, "Education reform is a long-term business issue, as important to our successful operations as customer safety or capital formation."

The committee's mission, affirmed at the December meeting, is to oversee and direct the Education 2000 commitment and the natural gas industry's initiatives to achieve a well-educated

future work force, customer base, and citizenry. With this in mind, the committee adopted eight strategic priorities to guide its long-term planning efforts for Education 2000. It also accepted a short-term tactical plan that defines the program's direction for 1991.

The tactical plan calls for a tightly managed combination of research and evaluation, culminating in a strategic plan by the end of summer. To accelerate strategic planning, the committee set up a seven-member task force, chaired by Mike Warren of Alabama Gas Corporation. Also serving on the Planning Task Force are John Croom; Howard Cosgrove, of Delmarva Power; John Jones, of the Association of Northwest Gas Utilities; Bill Matthews of Southern Natural Gas Company; Jim Sutton, of UGI Corporation; and Jon Thompson, of the Kalamazoo Math and Science Center and the A.G.A. Education Advisory Council.



Mike Warren leads Strategic Planning Task Force.

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Under the one-year tactical plan, A.G.A. will use the first months of 1991 to research the status of American education and assess educational programs in the natural gas industry and allied organizations. Then, this spring, the Planning Task Force will conduct a two-day summit, where 20 to 25 industry leaders, senior A.G.A. staff, and outside professionals will review the research findings and determine a preliminary strategic plan. Once the plan is completed, new program implementations should start in late 1991.

Concurrent with these research and planning activities, the tactical plan calls for ongoing communications and networking in the industry. Toward this end, the committee agreed that A.G.A. should maintain its role as a clearinghouse for Education 2000 information and continue publishing the *Education Exchange* newsletter. Other networking recommendations, such as a national education conference, are being considered by the Planning Task Force for inclusion in the strategic plan. The task force is also considering strategies, proposed by A.G.A.'s Consumer and Community Affairs Committee, for assisting disadvantaged youths.

Reflecting on the first meeting, Croom said the committee "clearly recognizes the unique role A.G.A. members can play in developing positive, proactive, and solution-oriented initiatives for education reform." 🍏

E D U C A T I O N **Exchange**

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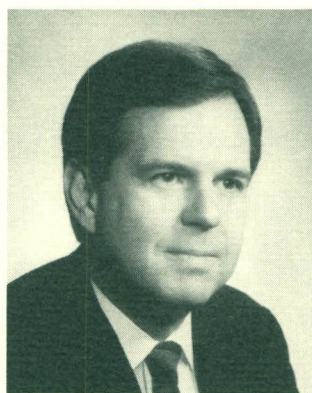
Editor
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Editorial Consultant
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A.G.A. President's Message **Make Education** **A Top Priority**

A.G.A.'s new Education Committee got off to an excellent start, and I thank all those who brought their experience, skills, and commitment to the planning table of our Education 2000 initiative.



**A.G.A. President
Michael Baly III**

The success of Education 2000 will be determined by the strength of each member company's commitment. Scores of member utilities are already deeply committed to educational improvement programs. Others recognize the need to act but have yet to find a

focus for their commitment. Still others remain unaware that the need to act is driven by hard-line business issues. To these members I echo *U.S. News and World Report's* David Gergen, who told A.G.A.'s American Gas Conference, "Keep in mind that it costs us more to send someone to the state pen than to Penn State."

Gergen's point was that America is paying a dollars-and-cents price, not just a social one, for ignoring basic educational problems. And he's right. According to one study, if education outcomes remain the same, an estimated 14 million Americans will be unprepared for the available jobs of 1995. That means longer, more costly searches for qualified employees and greater investments in remedial training. Already, notes one survey by *Training* magazine, 30 percent of American companies with more than 10,000 employees must offer some sort of remedial education. For all of American business, including our own industry, the ability to compete in the rising global marketplace is slipping through our children's fingers.

The situation demands concerted effort from everyone—parents, teachers, legislators, religious

groups, law enforcement agencies, social services, civic organizations, *and* business. With its technical and managerial expertise, its people, influence, and resources, business sits in a prime position to effect change. And the utility industry, with its close ties to the community, is ideally situated to take a lead role in the change process. But it takes serious commitment to achieve enduring change.

So I urge every chief executive in A.G.A.'s membership to allocate the resources needed to energize that commitment. Make education a top priority. Inform yourself and other executives on the basic issues, on the actions being planned in your communities, and on the work of those national business organizations that are mobilizing companies to act on the issue. Approach the subject as a parent, a concerned citizen, a business person. Embrace the solution as a corporate resolution. Set well-defined goals, and develop a strategic plan for achieving them. Then, insist on effective implementation.

I am intensely proud of the commitment our natural gas industry is making to the nation's educational reform goals. We have much to do, but I believe your commitment will reap lasting benefits, for our industry, our nation, and most importantly—for our children. 🍏

Virginia Teacher Wins NARUC Award

Seven educators received Excellence in Education awards from the National Association of Regulatory Utility Commissioners (NARUC) during its 102nd annual convention in Orlando, Florida, last November. Receiving the first-place national award and \$1000 was Rebecca S. Shepherd, a high school teacher with the Collegiate Schools in Richmond, Virginia.

Presented annually, NARUC's awards are given to teachers who have advanced excellence in education and helped prepare students for more effective citizenship by creatively using "The Balancing Act: How Utility Rates Are Decided." This innovative classroom unit was developed in 1987 by A.G.A., NARUC, educators, the Consumer



Rebecca S. Shepherd (center) receives Excellence in Education Award from NARUC President Sharon L. Nelson and Virginia State Corporation Commissioner Thomas P. Harwood Jr.

Federation of America, and other groups. The program places students in near real situations that challenge them to use analytical and mathematical skills to evaluate regulatory decisions.

In Shepherd's class, 36 students played the roles of commissioners, consumers, and utility executives during a mock regulatory hearing on site at the Virginia State Corporation Commission. The class was part of the Collegiate Schools' Summer Economic Institute, which attracts students from throughout Virginia, who then take what they learn back to their respective schools. Shepherd's institute program has been so successful that five other institutes in Virginia, North Carolina, Pennsylvania, and Georgia have been established around her model.

In presenting the first-place award, NARUC President Sharon L. Nelson said, "Mrs. Shepherd brought learning to life in the classroom. Her ability to motivate learning is a model to us all." Shepherd's teaching is supported by the Virginia State Corporation Commission, the Virginia Council on Economic Education, Commonwealth Gas Services, Inc., and other utility groups.

In addition to the first-place award, NARUC presented four merit awards—to Rita Tingley, of West Seneca, New York; Lisa Ellison, of Kokomo, Indiana; Cy Pombier, from Jackson, Michigan; and William Glinkman, from Boulder, Colorado. Two teachers also received honorable mention: Terry Beining, of Wabeno, Wisconsin, and Terry Mullins, of North Tazewell, Virginia. 🍏

EDUCATION 2000 IN ACTION

How A.G.A. members are helping American education become the world's best

Consolidated Natural Gas Company

The parent company of 15 other companies, including East Ohio Gas, CNG has long believed in contributing to the social, economic, and educational health of the communities it serves. Says Chairman and CEO George Davidson, "If we are to attract and retain good people, we must ensure that the society they live in is an inducement, not a detriment."

To better act on this philosophy, the company formed the CNG Foundation in 1985, which has since contributed nearly \$12 million to a wide range of organizations. Nearly \$3.6 million has gone to education, including \$900,000 to private liberal arts colleges whose innovative programs have benefitted their communities.

The CNG Foundation has also provided funding for an instructional unit called "Building America: A Securities Industry Experience." Designed for grades six through nine, this three-week course explains the role of investment and the securities industry in the nation's economy. The program was developed by the Enterprise & Education Foundation from an outline created by CNG's Investor Relations Vice President Kathleen Vuchetich.

Last fall, the Freedoms Foundation at Valley Forge awarded "Building America" its George Washington Honor Medal for excellence in economic education. CNG also extended its funding of the program so that any teacher in the United States, not only those in its service areas, can receive the materials free of charge. With this and other financial support, the award-winning program is expected to reach 250,000 students by the end of the 1991-92 school year.

Contact: Gary Pastorius, executive communications coordinator, CNG Tower, 625 Liberty Avenue, Pittsburgh, PA 15222-3199; (412) 227-1361. 🍷

The East Ohio Gas Company

East Ohio's commitment to education has evolved dramatically over the last 60 years. Once focused on teaching homemakers the joys of gas cooking, educational programs now range from workshops and scholarships to radio shows and partnerships.

As early as 1957, East Ohio had a full-time employee speaking to science classes in 300 high schools. In the '70s, the company decided that "teaching teachers" would be more effective, and a series of interdisciplinary teaching modules and workshops were developed. EOG refined its educational efforts in the '80s to stress "the three E's"—energy, economics, and environment. Now each year, the company sponsors a two-week course at the University of Akron, where teachers study the interaction between energy and the environment. In addition, more than 5500 Ohio educators receive the company's bimonthly newsletter on energy issues and teaching.

Recently, the newsletter, like EOG itself, has added an emphasis on community involvement. From

this focus has come a business-in-education partnership with Cleveland's John F. Kennedy High School. The partnership is designed to help students meet the expectations of the work place by focusing their goals on higher education and subsequent career options. East Ohio has also formed a scholarship program that annually awards \$2500 to an outstanding JFK senior and includes the offer of summer employment.

Over the last 20 years, East Ohio has awarded some \$464,000 in scholarships to more than 200 students, some employed by the company today. One vehicle for those awards is the Whiz Quiz program, a radio contest sponsored jointly by East Ohio, WERE radio, and the Cleveland Commission on Higher Education. The contest pits area high school students against one another to earn scholarship credits toward 10 local colleges and universities. Schools can win up to \$500 in credits, and championship winnings can total as much as \$4000.

According to Bob Varley, EOG consumer and educational relations manager, the company's commitment to education started with the theory that the more the public knows about natural gas, the more likely it is to choose EOG to heat homes, cook meals, and run factories. While that theory remains intact today, it has grown to encompass current concerns. Now, says company President Russell Gifford, "We think in terms of cultivating skilled students to be part of the highly trained work force needed to keep northeast Ohio economically competitive."

Contact: Bob Varley, consumer and educational relations manager, 1717 East Ninth Street, Cleveland, OH 44114; (216) 736-6207. 🍏

The Washington Water Power Company

WWP has been a strong supporter of education for over 100 years. But in 1989, the company chose to do more than provide assistance and take a proactive lead in addressing the K-12 educational needs of the Inland Northwest. Toward this end, the company has formed an aggressive strategic plan for increasing family and business involvement in the educational process. Says WWP Chairman and CEO Paul Redmond, "Of all the possible investments a community can make, none offers a greater potential for dividends than an investment in the lives of our children."

WWP spent more than a year developing its

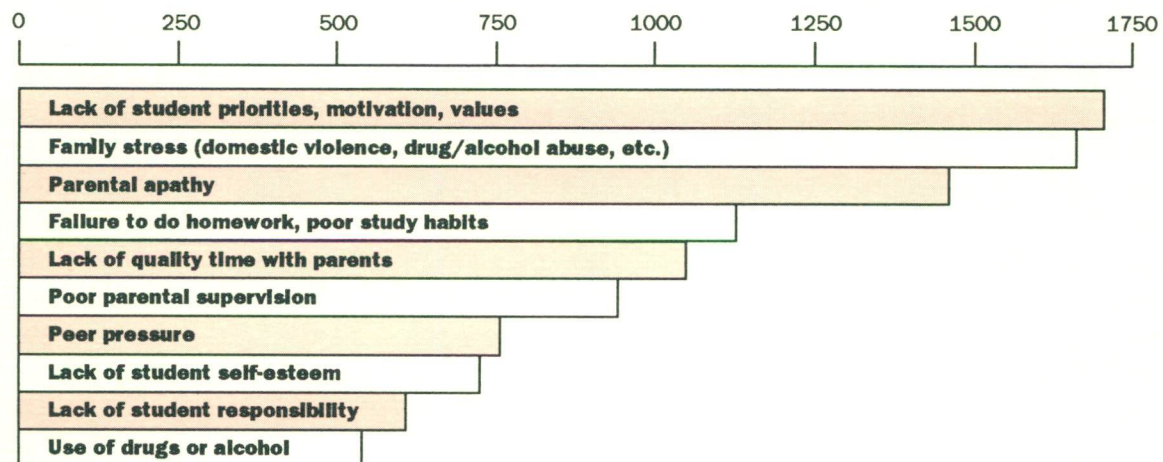
strategic plan, consulting with nationally recognized experts and conducting surveys (see chart, page 5). The resulting strategy targets five mutually supportive areas: public information, partnerships, students, educators, and families. Each initiative the company develops is tied to meeting the needs of one or more of these target areas.

Currently, the company's most extensive activities are in public information. Last fall, for instance, with support from Pacific Gas Transmission, WWP aired a company-produced TV commercial that encourages attendance at parent-teacher conferences. More spots are underway, dealing with family readiness, homework, and other issues. The company also formed partnerships to do a weekly news story on educational issues and achievements, and to produce a prime-time documentary on the conditions and needs of the area's schools and students.

Other ongoing initiatives include an educational advisory committee, a program that promotes improved student attendance, and a grant program supporting innovative classroom instruction. The company is also looking at changes in corporate policy to encourage employee involvement in education-related activities.

A key element of WWP's strategic plan is to measure its success—by tracking changes in teaching practices, student motivation, academic achievement, attendance levels, drop-out statistics, and post-

The Greatest Obstacles to Student Learning



Top 10 responses of 3,100 customers when asked the 5 greatest obstacles to student learning. Survey conducted by The Washington Water Power Company.

secondary school enrollments. Each year, WWP will update its strategic plan based on these general measurements of educational improvement plus more specific gauges of its own initiatives' success.

"We can no longer simply tell educators to do a better job," says Kent Adams, coordinator of WWP's community relations and educational programs. "Every segment of society needs to be involved. By working together, we can address the issues that impede learning and encourage innovative methods for improving students' motivation, knowledge, and skills."

Contact: J. Kent Adams, Washington Water Power Community Affairs, P.O. Box 3727, Spokane, WA 99220; (509) 482-4561. 🍏

A Video That Helps Parents Help Kids

Educators recognize that students do better in school when parents show an interest in their children's performance. Indeed, a recent customer survey by Washington Water Power showed that 33 to 52 percent of those responding believed the greatest roadblocks to learning are in the home, not school (see chart, page 5).

Clearly, parents can make a big difference. And teaching them how is precisely the goal of a 14-minute video offered through A.G.A. Called *Parents Make A+ Difference*, the video shows how parents can help their children with school and how other community members can get involved as well. The tape is ideal for churches, schools, PTAs, and civic groups wanting to raise the quality of education—especially for minorities.

Endorsed by the National Urban League, *Parents* is produced by the Northern Virginia Natural Gas Company and the public school system of Alexandria, Virginia. The tape comes with a helpful guide for presenting the film and leading constructive discussion. Copies of the tape are available from A.G.A. for \$14 each, with additional guides priced at \$1 each. To place your order, call the A.G.A. Order Processing Department at (703) 841-8557. 🍏

New Leader for A.G.A. Education Subcommittee

Robert W. Varley, consumer and educational relations manager for The East Ohio Gas Company, is the new chairman of the A.G.A. Educational Resources Subcommittee. Varley assumed the chair from Alfred E. Jennings, community relations director at Brooklyn Union Gas Company. Jennings, who remains active on the subcommittee, stepped down from his lead role after three years of distinguished service.



Robert Varley is new chairman of A.G.A.'s Educational Resources Subcommittee.

Joining Varley and Jennings on the subcommittee are Nina Caskey, educational services supervisor, Washington Natural Gas; Mary Davis, consumer information and education director, Atlanta Gas Light Co.; Bernie Houchin, planning and program administrator, Consumer Power Co.; Linda Neely, consumer and employee communications manager, Peoples Natural Gas Co.; Russell Rogerson, consumer information manager, Columbia Gas Distribution Co.; Maryann Yochim, community relations manager, National Fuel Gas Distribution Co.; Ed Dalton, president, National Energy Foundation; John Jones, executive director, Association of Northwest Gas Utilities; and Scott Schaedel, publications manager, Gas Research Institute. 🍏

Who's Saying What...

...About the Problem

Every eight seconds of the school day, an American child drops out. Every 53 minutes, one dies because of poverty. Every day, more than 1800 American children are abused or neglected, and almost 3300 run away from home. In just one day, six children will commit suicide, 40 will either die or be wounded by a gun, and nearly 650 will be arrested for drug abuse, drinking, or drunken driving. And each school day, 135,000 children carry a gun to school. Says Kati Haycock, vice president of the Children's Defense Fund, "A child is safer in Northern Ireland than on the streets of America."

Addressing the National Association of Partners in Education last October, Haycock noted that by the year 2000, America will have 4.1 million fewer people between ages 18 and 24 than it had in the mid-1980s. And with marketplace competition increasing worldwide, every one of them must be fully productive. Instead, she said, "Youngsters from every economic and racial group are neglected, adrift, and in trouble." She backed her charge with startling statistics, saying the crisis-level issues children face each day "pose a greater threat to American security, prosperity, and ideals than any external enemy."

One reason for the youth crisis, said Haycock, is that America "is not competitive with other industrialized nations in caring for its children and preparing for its future." Compared to six other industrialized nations, she said, America invests the smallest proportion of gross national product in education. She added that American school children know less geography than school children in Iran, less math than children in Japan, and less science than children in Spain.

Children must come first on the nation's list of funding priorities, said Haycock. Otherwise, the crisis will "bring America to its economic knees."

...About the Solution

Solving the nation's educational crisis is a "Rubik's Cube of issues that don't always line up neatly," said John L. Clendenin, chairman and CEO of BellSouth Corporation, at the A.G.A.

American Gas Conference in Boston last October. But one area he believes is essential to the solution is information technology, which can greatly improve the way students learn.

Clendenin cited one study which suggests that computer-aided instruction can produce about 30 percent more learning, in 40 percent less time, at 30 percent less cost than conventional teaching methods. "To us in business," he said, "those kinds of productivity gains are astonishing." And, with the extra time, teachers can pay more attention to students' individual needs.



For BellSouth's John Clendenin, technology is a key area where business can help improve education.

Technology also offers tools that can help students gain the "cultural awareness they'll need in a global society," said Clendenin. Using electronic mail, for example, a class in Boston communicated with students in Japan "on topics ranging from rap music to Zen Buddhism." Other tools can increase parental involvement, he said. One voice-messaging system, now being tested, lets teachers leave messages about the day's homework, which parents can then access and respond to via telephone.

Clendenin believes business and industry are especially equipped to address the issue of technology in U.S. schools and offered his own "A-B-C's" for doing so. First, he said, business must be an Advocate, moving technology higher on the education agenda. It must also be a Benefactor—donating technical expertise and intellectual support, as well as equipment. Finally, business must be a Catalyst for change by taking a lead role and mobilizing the energies of its people. 🍏

A.G.A. Funds TV Studies on Nature

This winter, students across the country will be spending Sunday evenings watching TV while doing their homework. But this time—thanks to “World of the Naturalist”—many will be watching because it is their homework.

“World of the Naturalist” is a new educational package created to accompany the public television series *NATURE*. The package introduces students to the jobs and responsibilities of naturalists, conservationists, and ecologists, inviting the students to become naturalists themselves. They do so by watching the TV series and noting in their journals the animals, behaviors, and habitats they see. Students also are challenged to think of solutions to the problems confronting the world’s conservationists.

Designed for grades five through eight, “World of the Naturalist” was developed by the Educational Publishing Department at Thirteen/

WNET in New York. Funding was provided by the American Gas Association, which has cosponsored the *NATURE* series for seven years.

“World of the Naturalist” covers six of this season’s *NATURE* episodes (see chart). Package materials include a four-color folder, 16-page teacher’s guide, student worksheets, discussion questions, research projects, and poster. A.G.A. members wanting to distribute additional packages, or those wanting more information on the *NATURE* outreach program, should contact A.G.A.’s Connie Waring at (703) 841-8665. 🍏

“World of the Naturalist” Broadcast Schedule*

One Man’s Kenya	February 24
Elephants of Tsavo	March 10
Serengeti Family	March 17
Teton Wilderness	March 24
Giant Otters	March 31
Yellowstone on Fire	TBA

*Check local listings for exact time in your area.

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EDUCATION

Exchange

A publication of the American Gas Association

NARUC Backs Education Reform Initiatives

The National Association of Regulatory Utility Commissioners (NARUC) unanimously approved a resolution this February endorsing utility efforts to improve education. The resolution declares that programs such as A.G.A.'s Education 2000 are "consistent with a utility's long-range business planning for safe, reliable, and efficient operation." It also urges state commissions to support such initiatives.

Adopted by NARUC's Committee on Administration then by its Executive Committee, the resolution received strong support from utility groups. A.G.A. First Vice Chairman John H. Croom urged acceptance in a speech before the Committee on Administration. In addition, the Edison Electric Institute, the U.S. Telephone Association, and the National Association of Water Companies wrote endorsement letters to NARUC Administration Committee Chairman James Burg, of South Dakota. Burg cosponsored the resolution with Judge Thomas Harwood, Jr., of the Virginia State Corporation Commission.

In his remarks, Croom, who is chairman of A.G.A.'s Education Committee and chairman, president, and CEO of Columbia Gas System, Inc., outlined the critical business issues arising from today's educational crisis. He explained the importance of the resolution as a response, saying it recognizes that the cost of "reasonable" efforts to build a skilled and literate work force are necessary and valid business expenses "that forestall more costly remedial actions in the future."

Croom praised NARUC for its timely insight, adding that one day utilities and their regulators will be judged on how they responded to the warnings of the "human capital crunch." Adoption of the resolution, he said, would provide a positive response to that evaluation.

Following the resolution's unanimous approval, Judge Harwood wrote to all state utility commissioners and urged them to make the resolution "policy in their states." "We, as government leaders, must heed the unified call of our governors and the President and assist in enacting the 'sweeping, fundamental changes'...they have set. If we do not act," he said, "we will be failing our responsibilities to the consumers we are obligated to serve."

Along with his letter, Harwood sent an A.G.A.-prepared brochure containing the NARUC resolution and Croom's remarks. He urged the commissioners to read the brochure and share it with their staffs and utility executives, saying, "The vision is clear, and it is accurate. This sobering warning requires the immediate action of both commissions and utilities. We are delighted

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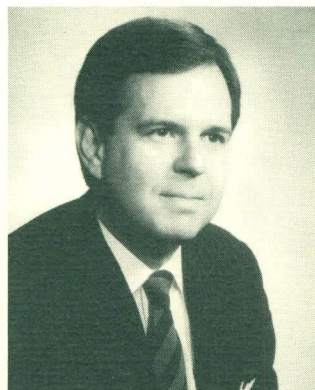
that NARUC has recognized the importance of education reform as a legitimate business issue facing our regulated industries."

Your copy of the A.G.A. brochure, titled "Public Education Reform: A Business Necessity," is included with this issue of *Education Exchange*. 🍏

A.G.A. President's Message

Education Issues Are Business Issues

The American Gas Association commends NARUC's recognition of the link between utility operations and the new education reform effort.



**A.G.A. President
Michael Baly III**

NARUC's resolution sends a clear message to state commissions and utilities: NARUC expects utilities to play an active part in supporting the nation's new educational goals. Moreover, these efforts should be seen as a prudent business investment—not a charitable contribution. I

was very proud to watch John Croom address the NARUC Committee on Administration. He said, "We are not talking about public relations ventures....We are talking about securing needed business resources."

We believe NARUC's resolution will greatly help utility executives and state commissioners understand this important point. The attached A.G.A. brochure containing the resolution and John's remarks will also aid the growth of that understanding and recognition of the business reasons behind our Education 2000 initiative.

Today's educational failure jeopardizes the future of all American businesses. For utilities, it threatens to create a public that can't understand our bills and safety messages; a work force that can't ensure our continued safe, reliable, and efficient operation; and a nation of businesses

without the technological strength to ensure the economic health of the communities we serve.

You've probably seen the old ad, "You can pay me now, or you can pay me later." Through A.G.A.'s Education 2000 commitment, the natural gas industry has decided to invest now in education reform, rather than pay later in higher training costs, misinformed consumers, less reliable services, and lost business opportunities. NARUC's support of these efforts greatly strengthens their potential for success. We sincerely appreciate the leadership and concern shown by NARUC President Bill Badger and Gas Committee Chairman Frank Heintz, both of the Maryland Public Service Commission. And we are equally grateful to the resolution's cosponsors, Commissioners Jim Burg and Tom Harwood.

In conjunction with NARUC's action, A.G.A. is teaming up with the Edison Electric Institute, the U.S. Telephone Association, and the National Association of Water Companies to develop a national utility partnership for education reform. As evidenced by their strong support of the NARUC resolution, these groups share our concern about the educational crisis. Together, the nearly 1.5 million employees represented by their members and ours can have an enormous impact on the nation's schoolchildren and the future prosperity of all. 🍏

E D U C A T I O N

Exchange

The *Education Exchange* is published quarterly by the American Gas Association, 1515 Wilson Blvd., Arlington, VA 22209.

The aim of the *Education Exchange* is to foster the sharing of information on educational issues and programs and to assist natural gas companies in their ongoing efforts to contribute to improving the quality of the U.S. education system.

Editor
Ray Volrath

Senior Writer
Linda Kinne

Director
Communications Program
Steve Kussmann

Who's Saying What...

...About Business's View of Education

How do the top executives in America's largest corporations feel about the nation's public education system? According to a recent survey of A.G.A.-member companies, 75 percent of respondents see their local public schools as having difficulties. About 20 percent believe their schools are in serious trouble. When asked if they're responsible for improving education, 81 percent of the companies indicated that they are.

The A.G.A. results mirror a survey sponsored by *Fortune* Magazine and Allstate Insurance, in which most executives were "highly critical" of our public education system. Of 1000 Fortune 500 industrial and service companies surveyed, most of the respondents said the system's current status poses a major dilemma for the United States.

The survey found that the problem affects the two sectors differently. While both criticize the system equally, service companies are more likely to report that they're having a hard time hiring *new employees* with good basic education and that this deficiency is reducing *productivity*. Industrial companies, on the other hand, are more likely to report that the lack of good basic education among *present employees* is interfering with the firms' *ability to compete* against foreign companies.

...On Being 'Radically' Responsible

"Do you as business leaders ask applicants for their high school record? Do you use the high school diploma as anything beyond a proof of age?" These probing questions and others were posed by former New Jersey governor Thomas Kean to the Delaware State Chamber of Commerce last January. Speaking at the chamber's annual meeting, Kean, who is now President of Drew University in Madison, N.J., said that to reach the nation's new education goals, "We must be radical." He reminded the chamber members that the problem school is *our* school, "not the one across town...in the city." Even the schools considered very good, he said, may only be mediocre when compared on a world scale.

"Time is not on our side," warned the former governor, who noted that the innovative programs many businesses are already involved with may not be enough. Kean charged the business leaders to get a greater sense of urgency—"even, if possible, redouble your efforts....We need your vision, and we need your courage." 🍏

A Perfect Balancing Act



National Fuel's Bill Hill and Rita Tingley

It was unusual for Rita Tingley to receive a NARUC Award of Merit for her implementation of "The Balancing Act: How Utility Rates Are Decided." Not that her implementation wasn't unique; but the awards typically go to educators who spend their days in the classroom, and Tingley doesn't. Rather, she's an educational consultant for National Fuel Gas Distribution Corporation in Erie, Pennsylvania. And while her award may be atypical to some, it makes perfect sense to National Fuel President Bill Hill: "We have a long history of cooperation with educators in those school districts we serve." Hill is a member of A.G.A.'s Education Committee. 🍏

Important note...

The 1991 NARUC National Awards Program for Excellence in Education has been announced. A copy of the entry form is included with this issue of the *Education Exchange*. For more information contact the editor.

EDUCATION 2000 IN ACTION

How A.G.A. members are helping American education become the world's best

New Jersey Natural Gas Company

Two years ago, New Jersey Natural Gas saw itself as one of many businesses facing the prospect of hiring from an inadequately trained work force. Hoping to thwart such a future, company personnel began meeting with school administrators and teachers from Asbury Park, a mostly minority urban city in the company's service area. Together, they came up with Project Venture, a school-business partnership that shows all of the city's fifth-grade students how their schooling relates to real-life work.

The program uses 11 company volunteers who have developed classroom projects within their fields of expertise. The volunteers spend one hour a week, for six weeks, teaching their projects and linking the skills in their respective fields to the math and language skills the fifth graders are learning. With the accounting department volunteer, for example, the students form a corporation that builds model airplanes. They then learn how to sell the planes, advertise them, and make a profit, using math and writing skills. The communications volunteer reinforces writing and speaking skills as the students publish a newsletter and



New Jersey Natural Gas Company employee Jon Brenner explains his robot dog, K-9, to Project Venture fifth graders.



Kraig Sanders, a New Jersey Natural Gas engineer, shows a map of the utility's distribution system to students in the Asbury Park school system.

produce video tapes. Data processing personnel emphasize math, measurement, and natural sciences while teaching the students how to build small robots. And a civil engineer has the students write applications to build suspension bridges, which they then build out of wood and glue.

At the end of the six weeks, each class tours the company's headquarters to see the skills they've learned being used on the job. Each class also meets with James T. Dolan, Jr., chairman and CEO of the company's parent organization, New Jersey Resources Corporation. "This is new ground for us," says Dolan. "But if we're unhappy and want to complain about education today, then we have to make ourselves part of the process to come up with a solution."

The company actively monitors reaction to Project Venture, and to date, everyone involved is pleased with its progress. Even customers write in to praise the program's efforts. But Dolan believes there's still much more to do. "How effective would Project Venture be," he asks, "if we had teams of volunteers from the wider business community in every middle school or in grades one through eight? I cannot help but wonder what the dropout rate would be if there were that kind of broad-based participation."

Contact: Nicholas Gentile, Project Venture coordinator, 1415 Wyckott Road, Wall Township, NJ 07719; (908) 938-1235.

Texas Gas Transmission Corporation

Each year, the Kentucky School Boards Association presents its highest award to the one corporation that has best supported K-12 education in the state. This year, that honor went to Texas Gas Transmission.

Based in Owensboro, Kentucky, the company operates in eight states, and according to President and COO Robert Best, "Education is, without exception, the number one or number two priority in all these states." So Texas Gas has dedicated Senior Vice President Ted Smith to spend whatever time is needed at the local, state, and regional levels to help improve K-12 education. Also Chairman of the Owensboro Board of Education, Smith has helped form a local Citizens Committee on Higher Education and been a pivotal member of the Kentucky Educational Foundation (KEF). (Texas Gas also paid a large part of the salaries needed to attract high-caliber directors to these groups.)

The foundation consists of business and community leaders throughout the state, committed to raising Kentucky's economic prospects by effectively educating its people. Joining Smith on the KEF Board of Directors, for instance, is Commonwealth Governor Wallace G. Wilkinson. The foundation has been heavily involved in the recently passed Kentucky Education Reform Act, which many states have adopted as a model. Now the group is forming a new "Institute for the 21st Century" specifically to train school district teams on the act's implementation.

A unique concept, the institute will select up to ten school districts to participate in the first round of two-year training. The districts must be nominated by local businesses, which also must contribute \$4000 to cover institute expenses. Among other topics, training will focus on managing change, creating the climate for reform, developing teamwork skills, and using community partnerships to support reform.

**'At the local level,
we can have a real
impact and at the
same time be
aware of what we
are accomplishing
on a day-to-day
basis.'**

Even with its broad reach into statewide programs, Best explains that Texas Gas prefers to work mostly at the local level for improved education. "At the local level," he says, "we can have a real impact and at the same time be aware of what we are accomplishing on a day-to-day basis."

The company is actively involved in many local programs, including scholarship and Junior Achievement activities, and particularly efforts to support preschool education for disadvantaged children. Working with Owensboro's independent school system, for example, Texas Gas has helped bring together—under one roof and one management—all the agencies whose resources can improve preschool education for poverty-level children. The company also serves a key role in a highly successful day care center for a public housing project. The center accepts children from the project only if their parents agree to advance their education so they can become self-sufficient.

Contact: G. Ted Smith, senior vice president, 3800 Frederica Street, Owensboro, KY 42301; (502) 926-8686.

Public Service Electric and Gas Company

The hands and the pockets of PSE&G reach far and deep in its efforts to improve education in northern New Jersey. The company provides corporate representation and financial support to more than 100 educational programs, heavily stressing youth-at-risk and work-study ventures, as well as professional partnerships.

Each week, for instance, approximately 100 employees voluntarily tutor an equal number of Newark's third graders, hoping to improve their basic reading and math skills. Through the Boys' and Girls' Clubs of Newark, 26 employees serve as one-on-one mentors to a select group of at-risk ninth graders. An anonymous donor promised the students college educations if they successfully complete high school, so the volunteers are providing the guidance, role modeling, and

companionship to help the students reach their goal. The company also sponsors a summer basketball camp, where NBA players promote an antidrug message and stress the need to avoid negative peer pressure.

PSE&G funds numerous scholarships and tuition-aid programs for minority, low-income, and inner-city students. Through a co-op program called Inroads, the company employs selected minority college students in positions requiring engineering, computer science, or accounting skills. As part of the Private Industry Council of Greater Raritan, the company also works to cut unemployment among youths aged 16 to 21 by offering after-school, summer-employment, and training programs.

Allied with other businesses, learning institutions, and nonprofit groups, PSE&G works ac-

tively to increase awareness of educational issues and stimulate reform. Last year, the company cosponsored a statewide conference, which looked at New Jersey's recently enacted Quality Education Act and its links to business, education, and the community. Similar to the involvement of Texas Gas in the new KEF institute, PSE&G participates in a program to provide management assistance to public schools. Designed in part to foster long-term partnerships between businesses and school districts, the program offers a full curriculum of management training to participating teams of school administrators. As a member of other professional alliances, PSE&G also promotes awareness of energy and environmental issues.

Finally, but by no means the last of this company's efforts, PSE&G helps to underwrite the

Hot Tips for Partnership and Mentor Programs

The Doable Dozen

Looking for good ideas on school-business partnerships? Consider *The Doable Dozen* by Cynthia Shelton. Shelton is executive director of Private Initiatives in Public Education, the school-business partnership program of the Seattle Chamber of Commerce. The program has been recognized nationally for its uncommon success in developing lasting, mutually beneficial relationships between schools and a diversity of business partners.

For this book, Shelton gathered 300 ideas from leading partnership coordinators around the country. She organized the ideas around 12 curriculum goals—developing career awareness, understanding the American economic

system, and involving parents in student learning are just a sample. The quick and easy reference also includes a complete list of contributors plus their addresses and phone numbers.

The Doable Dozen is priced at \$2.95–\$7.95 each, depending on the quantity ordered. For more ordering information, contact the National Community Education Association, 801 North Fairfax Street, Suite 209, Alexandria, VA 22314.

The Mentor Handbook

This practical guide by Susan G. Weinberger will be invaluable to sponsoring companies, individual volunteers, and school districts involved in mentor programs. In addition to explaining how to start a

mentor program and training, it describes mentor roles and responsibilities, student attributes and attitudes, benefits to participants—plus strategies that work and evaluation techniques.

Weinberger is director of public affairs for Norwalk, Connecticut, public schools and immediate past president of the Association of School/Business Partnership Directors. She draws on 8 years of successful experiences with volunteers from 53 corporations in the Norwalk Adopt-A-School program.

Copies of *The Mentor Handbook* are available for \$6.50 each from Educational Resources Network, Inc., 18 Marshall Street, Norwalk, CT 06854. 🍏

cost of educational programs aired on WWOR-TV. The programs, seen across much of the country through cable television, have addressed numerous education-related issues, including teen pregnancy; the latchkey syndrome; educational values of parents, students, teachers, and administrators; and a decision-making convention on the issues confronting urban students.

Contact: Jo Ann Dow, educational services manager, Educational Services Dept., T-10C, 80 Park Plaza, Newark, NJ 07101; (201) 430-5861. 🍏

Advisory Council Members Making Key Inroads



Dr. Jon R. Thompson now leads Chicago Academy.

Over the past five years, Dr. Jon Thompson has been instrumental in developing the Kalamazoo Area Math and Science Center (KAMSC), Michigan's first specialized math and science high school. Now Thompson—a member of A.G.A.'s Education Advisory

Council and Education Committee—is tackling a new challenge. He's leading the Chicago Academy in Illinois.

A nonprofit program, the Chicago Academy will offer intensive professional development in math and science to the city's 27,000 public school teachers. All the math and science teachers from one school will spend two days in training while substitute teachers handle their courses.

"I think it's a chance to fight one of the most critical problems in the United States," says Thompson. And that's the high number of urban kids missing out on math and science. "We'll build a model that can be extended to other cities, like we did in Kalamazoo, only on another scale."

Since opening in 1986, KAMSC has been the model for 14 other programs across the state. The

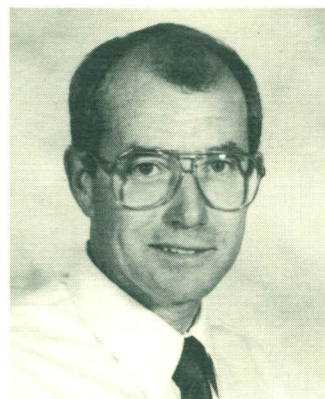
center started with a \$2 million grant from The Upjohn Co. and, largely because of Thompson's efforts, has continued to build support from the business community. Only freshmen attended during the first year, but now about 300 students from all high school grades attend either morning or afternoon classes. Last year, KAMSC also sponsored training for 540 teachers as well as outreach programs for 2800 students in grades K-12.

"We need to sell this idea to more businesses and network with other communities," says Thompson. He hopes to involve Chicago's various gas companies with the academy's work and plans to remain active in A.G.A.'s educational programs.

* * * * *

According to the superintendent of the Harbor Creek School District in Erie, Pennsylvania, the classroom of Chuck Arnold "explodes with interest and learning." Apparently, quite a few others agree. The fifth- and sixth-grade science teacher at Erie's Clark Elementary School was recently selected as one of Pennsylvania's outstanding teachers.

Arnold, who serves on A.G.A.'s Education Advisory Council, was among 100 elementary, high school, and college educators whose exceptional performance was honored in the state's first Salute to Teaching. As part of the salute, resolu-



Educator Chuck Arnold recognized as outstanding teacher

tions were presented to the Pennsylvania House and Senate; then Arnold and the other teachers visited with their legislators to discuss educational issues.

The Salute to Teaching was funded and sponsored by the Pennsylvania Academy for the Profession of Teaching. It

was coordinated by the College of Education, School of Continuing Education, and Office for Institutional Advancement at Indiana University of Pennsylvania. 🍏

When I Grow Up I Want To Be...

Ask a young person, "What do you want to be when you grow up?" and you'll probably get answers like "astronaut," "disc jockey," "lawyer," "teacher," or maybe even just plain "rich." What you're not likely to hear is "account representative," "personnel manager," "dispatcher," or any of the thousands of behind-the-scenes jobs that make a business run. And precisely because so many jobs are behind the scenes, young people are typically unaware of the boundless career choices they have.

To help close some of that gap, A.G.A. offers educators a career-awareness book, titled *Explore Your Future: Careers in the Natural Gas Industry*. Designed for use in junior-high schools, the book explains how the gas industry operates and who does what along the way. Students learn what real workers do every day, what abilities and educa-

tion they must have, and even what they say about their jobs. Hands-on activities help students shape their career plans, hire employees, and assign production workers to tasks. This last activity can be especially fun as students encounter job titles like "roustabout," "shooter," "pumper," and "treater."

Explore Your Future is produced by A.G.A.'s Educational Resources Subcommittee. It has been reviewed by members of the Education Advisory Council, who heartily encourage educators to be flexible and creative with the book. Aside from reviewing the contents, no special preparation is required, and the material can be freely adapted (and reproduced) to suit individual class needs.

Prices for *Explore Your Future* range from \$1.50 to \$2.40 each, depending on the quantity ordered and your membership in A.G.A. To get more detail on pricing and order copies for educators in your community, call the A.G.A. Order Processing Department at (703) 841-8557. 🍏

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EDUCATION

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A.G.A. Education Committee Adopts Strategic Plan

Following six months of intensive study, A.G.A.'s Education Committee has adopted an Education 2000 Strategic Plan that lays the groundwork for the association and its members to become integral parts of the long-term national education-reform effort. The plan, drafted by the committee's Planning Task Force, defines the mission, vision, goals, and objectives of Education 2000, as well as the constituent groups who can affect its success.

"This strategic plan provides a firm foundation for A.G.A. to implement an effective Education 2000 effort," says A.G.A. President Michael Baly. "It gives us the direction to carry out high-impact education-reform initiatives."

Three key goals have been set for Education 2000: support member efforts to be involved in education reform, advocate reform at state and local levels, and develop partnerships with allied organizations. For each goal, the plan sets specific, quantifiable objectives to be reached within the near

(1992), midterm (1995), and long-range (1996-2000) future.

Middle- and long-term objectives expand upon those set for 1992, so that efforts can stay focused on key targets throughout the decade. The early "building blocks" include sponsoring the first biannual summit meeting on education; publishing a "how to" education-planning workbook for utilities, and forming relationships with other utilities, utility regulators, government, and national organizations.

During the midterm, member companies will be encouraged and helped in their own Education 2000 work. Their current efforts will be appraised and strategic plans drafted to guide them in forming partnerships with local schools and authorities. Regional training programs will be held, allowing representatives from member companies to learn how best to build successful initiatives.

A basic premise of Education 2000 is that it will "learn as it goes." So in 1996, A.G.A. will review its early experiences and revise the current long-term objectives accordingly. Still, by the second half of the decade, the association plans to have a

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formal role in the U.S. Department of Education's New American Schools program and a national utility coalition actively involved in joint education programs.

"We have completed an important planning phase," says Task Force and Education Committee Chairman Mike Warren, of Alabama Gas Corporation. "Now we need a commitment from each and every member of A.G.A. because it's going to take all of us to make this work."

Warren notes that A.G.A.'s plan for Education 2000 will closely follow the national education goals outlined last April in President Bush's America 2000 strategy. "Clearly," he says, "the challenge is great."

The committee's 19-member task force produced the strategic plan after consulting with national education experts, reviewing education-reform literature, and holding a two-day planning workshop. In addition, Sextant Consultants, Inc., produced extensive background papers for the task force. The papers analyze partnership opportunities, methods for local educational change, and results of the A.G.A. Education 2000 survey.

Free copies of the plan and the background papers are available by calling A.G.A. Education Programs Manager Ray Volrath at (703) 841-8676. 🍏

EDUCATION **Exchange**

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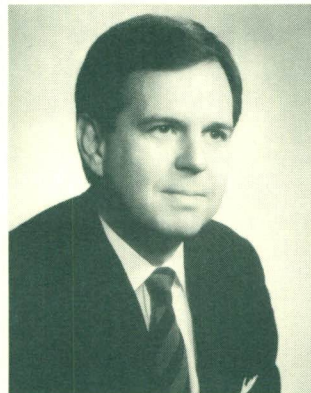
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Editor
Ray Volrath

Senior Writer
Linda Kinne

Director, Communications Program
Steve Kussmann

A.G.A. President's Message **A.G.A. Will Be There for** **Real School Reform**



A.G.A. President
Michael Baly III

Members of the Education Committee and its Planning Task Force are to be commended for producing such a bold Education 2000 Strategic Plan. Just as the launch of this program was our formal recognition of the need for school reform, so too is this plan our formal com-

mitment to helping that reform take place.

We believe the strategic plan acknowledges the real crisis in today's schools: they operate around a century-old vision—around a model of an industrial society that no longer fits the realities of a changing, information-age economy. If, as indeed it did, American business in the early 1900s could help fashion the school system to meet the needs of that era, certainly we can do the same to meet the needs of this one. And we will.

President Bush said as he launched America 2000, "What happens here in Washington won't matter half as much as what happens in each school, each local community, and yes, in each home."

His statement reinforces our belief that the nation's utility industry is ideally suited to help in this urgent effort. Utilities are the only industry in this country that bridge national, state, and local operations, even going directly into the homes of every American. The Education 2000 Strategic Plan clearly recognizes this fact. It directs A.G.A. to help its members and other utilities build the initiatives suited to their individual communities. And it is designed so that A.G.A. can encourage, support, and help coordinate those efforts.

The plan takes a top-down, bottom-up approach to education reform. At the local level, utilities can work for reform from the bottom-up,

in classrooms as well as state legislatures. At the national level, A.G.A. can work from the top-down, targeting established policies that hinder innovation and supporting major programs that seek creative, sensible alternatives.

In the past, we have asked A.G.A.'s members to make this program a top priority. Now, I ask again. Education 2000 is and will continue to be a top priority of mine. Through it, we are aligned with the education goals set by President Bush and the nation's governors, and we have accepted the call-to-arms issued to business in the America 2000 strategy. We are committed to the success of Education 2000. 🍏

New Committee Chair Says 'It's Time to Act'

As the new chairman of A.G.A.'s Education Committee, Mike Warren is asking two pivotal questions, "Do we have the right stuff?" and "What kind of 'stuff' is it going to take?"

The Alabama Gas Corporation president and chief executive officer is assuming the committee's lead from former chairman John Croom, of Columbia Gas System, Inc. Long active in efforts to improve education, Warren led the task force that developed the Education 2000 Strategic Plan and is a member of the Board of Education for Alabama's City of Mt. Brook. He believes the natural gas industry can play a key role in effecting education reform—"if we have the will to make things happen and the fortitude to stick with it."

"The education system in this country cannot be reformed overnight," he says. "To do it right, it's going to take time. This cannot be something that you're interested in for just a few weeks or months."

Warren stresses the word *reform*, noting the national consensus that mere improvement is not enough. In fact, he says, "Few question the importance of education reform or the need for it. What is questioned is the willingness of the American people, in general, and business, in par-

ticular, to make the commitment needed to achieve real and meaningful reform.

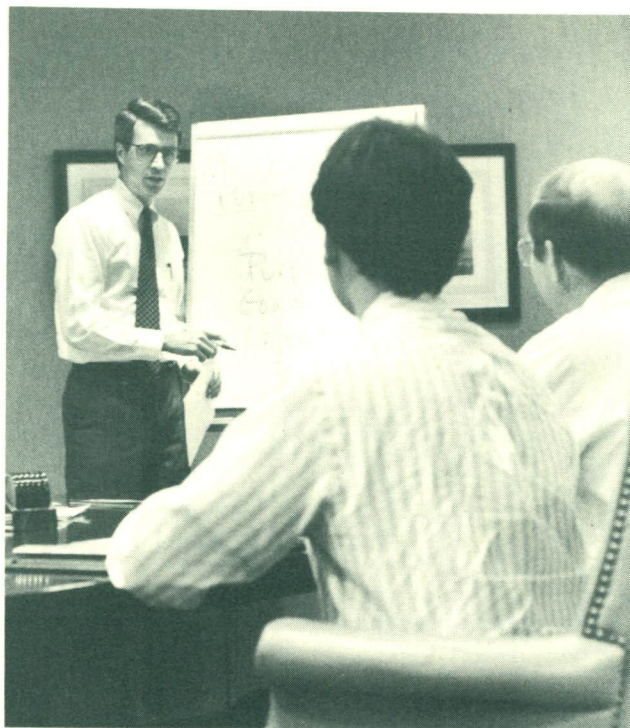
"A.G.A.'s Education 2000 is a tremendous commitment—ten years! It will be a great test of the will of our member companies and our electric, water, and telephone company partners. And it will demand substantial involvement from each and every one of them."

Warren explains that widespread commitment is essential "if our education-reform efforts are to prevail on the national, state, and local levels." The association and some key individuals can help on the national level, he says, but only individual companies can bring about reform within states and local communities. "And we must work on each level to be truly successful."

Will we be able to sustain our efforts? Do we have the right stuff?

"I think so," says Warren. "We've got a solid strategic plan, and as we put it in place, we'll be going to all the member companies to see how it reflects their goals."

"The key point is that now it's time to act. I hope every CEO or president of every member company will make a commitment to Education 2000—for truly, American education needs us." 🍏



Mike Warren makes a presentation to fellow members of the Board of Education for Alabama's City of Mt. Brook.

EDUCATION 2000 IN ACTION

How A.G.A. members are helping American education become the world's best

SCANA Corporation

Education-reform efforts at SCANA Corporation are fueled by one key philosophy—that education greatly determines economic growth. The holding company, based in Columbia, South Carolina, believes businesses must ensure that students get a first-rate education if everyone's future is to be economically sound. In line with this belief, SCANA has an ambitious commitment to raising, first, the desire for a better education throughout the state, and second, the quality and number of opportunities for getting it.

To meet its commitment, SCANA has added dozens of new programs to its long-standing work for improved education. One of the most innovative is a partnership with the University of South Carolina, which sends its athletes into local schools to talk about the benefits of a good education. Last year, officers from SCANA's principal subsidiary, South Carolina Electric & Gas, joined the athletes to discuss what it takes to get a job in today's market. They explained that companies' standards are more

rigid than ever and that employers look specifically at solid education as a basis for hiring. Thus, to get good jobs, students have to work harder and be smarter.

To get that message to more people, SCANA partnered with two television stations—WIS in Columbia and WCIV in Charleston. Together, they sponsored a series of commercials with Bill Cosby, Will Smith, and other stars telling students, "The more you know, the further you'll go."

SCANA also partnered with WIS-TV to send 55 students to a Stay in School Jamboree hosted by the National Basketball Association as part of its All-Star Game activities. The students were members of Columbia's Cities in Schools program, which offers a special learning environment to students at risk of dropping out. And most of those students graduate.

"Our children are our communities' most important asset," says SCANA CEO Lawrence Gressette. He and other senior officers are personally involved in educational improvement, actively serving on numerous boards of education. Hundreds of SCANA employees also work regularly with students as mentors, coaches, and literacy volunteers. And each time a SCANA employee donates money to one of the state's schools, SCANA matches the gift dollar for dollar.

Gressette says SCANA is determined to find



SCANA sent these teenagers to an NBA-sponsored Jamboree, where more than 20,000 at-risk students heard stay-in-school messages from some of their favorite athletes and TV stars.

even more opportunities to help the state's youth reach their full potential. "Our company believes it has a responsibility to do that. Besides, we've all got a vested interest. A better trained work force means a brighter future for all of us."

Contact: Elizabeth G. Quackenbush, Public Relations Coordinator, SCANA Corporation, Columbia, SC 29218; (803) 748-3618.

Wisconsin Power & Light Company

At WP&L, the commitment to influence change in education begins at the top. Chairman, president and CEO Erroll Davis, an A.G.A. Board Member and member of the Education Committee, is the driving force behind the company's educational programs. He serves on two university boards, fosters a variety of initiatives, and strongly encourages employees to give their time and talents to educational efforts. The employees, in turn, believe they *can* make a difference, and hundreds are doing so every day.

Says Davis, "American industry has reached a judgment that education is too vital to the future of our nation to be left entirely to professional educators. We are becoming more involved in all aspects of the system."

That involvement has been recognized by a number of professional groups. Recently, the Wisconsin Vocational Association praised WP&L's work with vocational schools—work that has encouraged economic development strategies for producing a competitive, quality labor force. Another award, from the Edison Electric Institute, credits the company's summer-internship program for its equal opportunity and affirmative action. The internship offers business management experience to women and minority college students, while company executives serve as their mentors.

WP&L has also been recognized for its forging of public-private partnerships. Last year, for instance, the company and its foundation formed the Youth Enrichment Scholarship program for deserving but economically disadvantaged minority students. In this unique consortium, the WP&L Foundation and other Madison businesses contribute scholarship funds; high school educators and counselors promote the program, and the Madison Urban League administers it. This spring, the



Public Service Company's Bill Martin speaks to a group of students at Smedley Elementary, a Family Resource School.

second group of ten high school seniors received four-year scholarships totaling \$120,000.

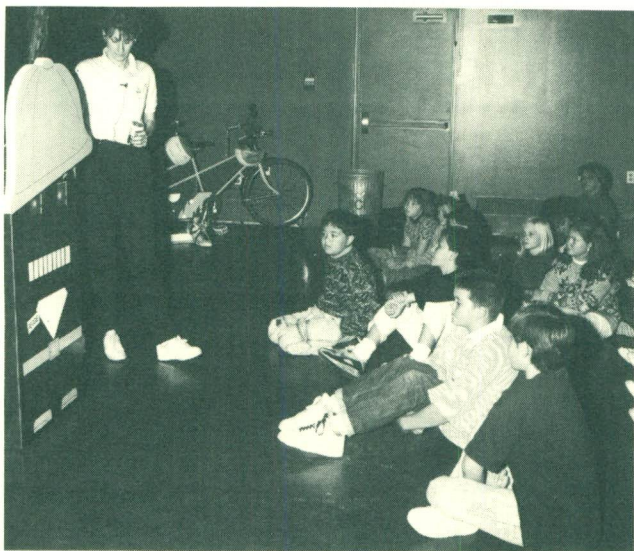
Davis notes that while the company is proud of its programs' success, "Much work remains to be done to restore our educational system to the level of excellence it once enjoyed. WP&L is committed to making that happen."

Contact: A.J. "Nino" Amato, V.P. Marketing & Communications, 222 W. Washington Avenue, Madison, WI 53701-0192; (608) 252-3115.

Public Service Company of Colorado

Supporting education has always been an easy choice for Public Service Company of Colorado. But today's crisis seemed to need more than the company's usual scholarship funding, teacher workshops, and classroom presentations. So, after conducting a year-long study of educational and community needs, Public Service started several new programs to boost education's success.

Research showed, for instance, that the success of a child's education depends not only on how effective the school experience is itself, but on how healthy the child's overall family and community life are. Given this fact, the company began a major project last year to set up "Family Resource Schools." The schools seek to improve the well-being of a child's family and community and thereby remove outside barriers to learning. Seven Denver elementary schools have joined the project, and Public Service is sponsoring two.



A Public Service Company employee presents an energy-related program to a group of students.

Although the program is still being shaped, it has an ambitious agenda for offering services in parenting, counseling, nutrition, job placement, and mental health. Last spring, the company held a day-long planning session that gave employees, parents, teachers, and administrators an opportunity to design the effort. The company also arranged for the Denver Art Museum to furnish services, including training parents to teach art classes and having local artists visit the schools.

In addition to funds, Public Service Company is providing the schools with its employees' expertise in organization, professional development, and management. The company believes employees should be involved in local schools and has long offered a speakers' bureau. Now this effort is being expanded, and employee volunteers are being trained to help schools with mentor programs, employee-teacher exchanges, and career fairs. Once trained, the employees will be assigned to specific schools.

According to Carol Shearon, Public Service's program officer for education, the company's research has proved "very useful. We intend to make a positive, long-term impact on the communities we serve. We are working to be a catalyst to lasting, dynamic change that will both improve our schools and enrich our communities."

Contact: Carol Shearon, Program Officer Education, Civic and Educational Affairs, P.O. Box 840, Denver, CO 80202; (303) 571-8473. 🍏

A.G.A.-NEF Partnership Sparks a New Flame

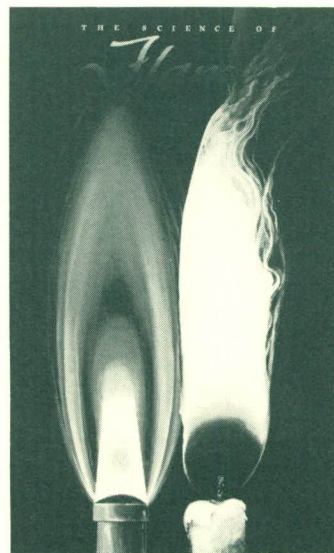
Partnered with the National Energy Foundation, A.G.A. has produced an exciting new educational poster called "The Science of Flames."

This dramatic, full-color drawing measures more than two feet by three feet and contrasts the yellow luminescent candle flame with the clean-burning blue flame of natural gas. Differences in the two flames are described in front insets, with detailed lesson plans and masters for student handouts printed on back for easy copying. Flame temperatures, reaction zones, chemical reactions, and emissions are fully and simply presented.

Your education and public relations efforts will benefit greatly from this poster. It's appropriate for all science teachers and relates directly to both the A.G.A. "Flames" video and the experiment booklet, "What Is a Gas?"

Copies are \$5 each, with quantity discounts available. Limited numbers are also being printed in a fine-art version, already framed, that will make striking displays in your offices and public areas. Funds from the art version's sales will be used to print copies of the educational version for the November issue of *Science Teacher* magazine.

To place your order, call the A.G.A. Order Processing Department at (703) 841-8557. 🍏



The fine-art version of the new Flames poster, available in limited quantities, makes a dramatic presentation in offices.

Who's Saying What...

On "Thinking Skills"...

Most high schools in America fail to prepare the majority of their graduates with the "thinking skills" needed for the modern blue-collar workplace, according to a report released this July by a special Labor Department commission.

Unless the situation changes, said commission chairman William Brock, the United States will have to compete in the global marketplace on the basis of the reduced wages of American workers instead of on their higher skills. Brock is a former labor secretary and U.S. trade representative.

The report by the Secretary's Commission on Achieving Necessary Skills calls on the nation's public schools to revamp their curricula so that high school graduates can enter the work force without the need for additional education.

Brock said the performance standard for the education system can be measured in the way U.S. companies are competing in the world marketplace. Holding up the U.S. auto industry as an example, he said, "Toyota is eating our lunch and so is Nissan and Honda."

The 31-member commission recommended that graduates should be proficient in what it called the "Five Competencies," or "thinking skills." [They should be able]...to allocate resources...work as team members and engage in problem solving...assess information...understand work systems...and deal with new technologies.

None of the five competencies replace the need for proficiency in the so-called three R's. Without the basic academic skills, the thinking skills will be of little value, said the commission.

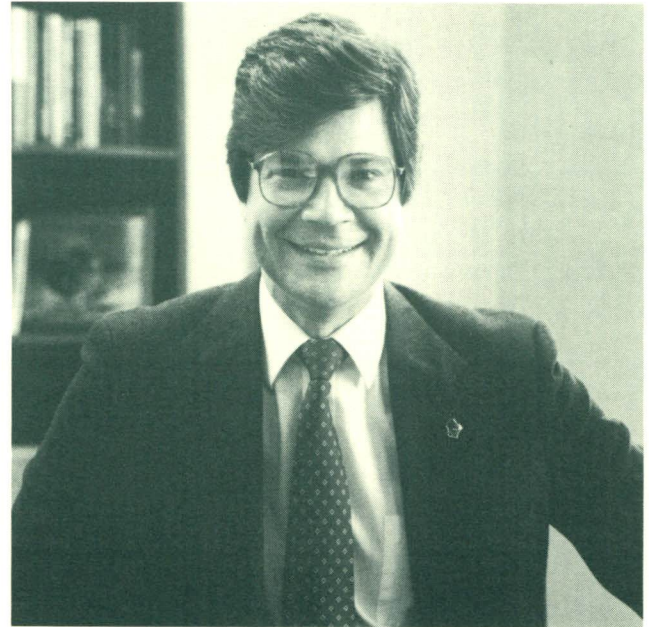
In an open letter to parents, the commission said parents "must insist that their sons and daughters master this know-how and that their local schools teach it. Unless you do, your children are unlikely to earn a decent living." (©1991, The Washington Post. Reprinted with permission.)

On the Workplace for the Unskilled...

A recent survey of 1,850 Wisconsin employers revealed that more than 90 percent are having trouble finding enough skilled workers to keep

their businesses operating. The survey was conducted for the Governor's Commission for a Quality Work Force, which issued its final report in May.

The report states that two key steps must be taken to improve the work force—not only in Wisconsin but across the nation. First, said the report, "build a world-class work force" by training and retraining those people already in the workplace. Second, "educate the workers of tomorrow" by redesigning high school and technical college programs to make them more responsive to the business and labor needs of the 21st century.



Nino Amato: The alternative to mobilizing education reform is "a cold and merciless" workplace for the unskilled.

"The key to maintaining and improving our standard of living is productivity growth," says A.J. "Nino" Amato, a vice chairman of the commission and a vice president of Wisconsin Power & Light Company. In the past, he says, we mostly simplified and automated jobs to increase productivity. But in today's economy "where quality, responsiveness, and variety command high prices, we must have workers with higher skill levels."

Amato says that business and industry must find ways "to improve performance in the workplace, and the employment and training community must be sensitive to those improvements. The alarming alternative," he says, "is a future workplace that is cold and merciless for those who lack basic skills." 🍎

Four Educators Win A.G.A. Science Awards

A.G.A. and the National Science Teachers Association (NSTA) presented four educators with the Science Teaching Achievement Recognition (STAR) award last March. Given each year at the NSTA annual convention, the STAR awards salute educators who have devised new or notably effective ways to teach pre-college science.

Ruth M. Ruud, a fifth-grade teacher at Chestnut Hill School in Erie, Pennsylvania, won the top STAR prize of \$1,000, for her program, "Teaming Education and Manufacturing." Ruud initiated "science-industry partnerships" that invited local industries to develop teaching units for the school district's science curriculum.

William W. Craig, chairman of the geology and geophysics department at the University of New Orleans, also received a \$1,000 award for his presentation, "Utilization of Master Teachers in In-Service Training of Earth Science Teachers." Craig's program is aimed at educating earth science teachers whose original training involved little exposure to earth science itself.

A \$750 award went to Thomas Altman, a physics teacher at Oswego High School in Oswego, New York. His program, "Lasers from Kindergarten to College," explored the many different uses of lasers and the ways to build and project them.

Finally, Mary Stein, a chemistry teacher from



A.G.A. Educational Programs Manager Ray Volrath with STAR award winners Mary Stein, Ruth Ruud, and Thomas Altman.

North Tonawanda High School, North Tonawanda, New York, received \$500 for her "Xtra Science in the Elementary Schools" program. "XSITES" enhances the elementary schools' science program and lets high school students teach science in a classroom.

Commenting on the awards, A.G.A. President Michael Baly said, "If America is to remain competitive in the world marketplace and sustain its own progress, education—particularly science education—will be a critical factor. We applaud this year's winners and all previous winners for their important contributions to their profession and our nation."

To apply for the 1992 awards, contact A.G.A. Education Programs Manager Ray Volrath at (703) 841-8676. Entry deadline is November 15, 1991. 🍎

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