

A MIXED PICTURE FOR CHEMICAL JOBS

EMPLOYMENT grew in Europe and Japan, but not in the U.S.

EMPLOYMENT AT Canadian, European, and Japanese chemical firms tracked by C&EN increased in 2008. In the U.S., employment at surveyed companies decreased only slightly.

The data seem counterintuitive, considering that 2008 saw the worst recession that hit the global economy since the Great Depression. But during the year, economists reminded us many times that employment is a trailing indicator of the overall economy. That means there is significant lag time between a downturn in production and a corresponding decrease in workers. Indeed, the graph of U.S. labor costs shows that the chemical workforce became rather expensive in 2008, given the decrease in production.

Employers are slow to lay off workers when demand drops, in case the decline is temporary. To hold on to skilled labor, firms try to cut costs in other ways, like shrinking their pool of working capital, selling unused assets, cutting benefits, and even forgoing raises and executive bonuses.

And yet, a huge number of people in the U.S. lost their jobs in 2008. According to the U.S. Department of Labor's Bureau of Labor Statistics, the country lost more than 3 million nonfarm jobs. Manufacturing employment shrank by 3.2%, whereas chemical employment decreased by only 1.3%. The chemical job losses in 2008 were steeper than in 2007, and the overall trend

is one of a slow but inexorable decrease.

Some chemical companies reported employment increases because of acquisitions. In the U.S., PPG Industries gained 10,000 employees when it acquired SigmaKalon. Canadian fertilizer producer Agrium added 4,400 people to its workforce when it bought fertilizer retailer UAP. And in Europe, AkzoNobel's purchase of ICI brought 17,400 workers to its payroll. Because the new workers were already employed in the chemical industry, the acquisitions do not actually increase the size of the chemical workforce.

In Japan, employment at major companies rose overall, but the per-company picture was mixed. At Sumitomo Chemical, headcount rose by more than 1,300, aided by the start-up of its Rabigh petrochemical venture in Saudi Arabia during the year. Mitsubishi Chemical took on about 2,500 employees from absorbing a pharmaceutical subsidiary into its operations. By contrast, DIC and Shin-Etsu Chemical reduced their headcounts.

As the year drew to a close, many chemical firms announced layoffs that didn't show up in 2008 data. BASF kicked off the trend on Nov. 19 with temporary facility closures and output reductions that affected 20,000 employees. Layoff announcements soon followed from DuPont, Dow Chemical, Eastman Chemical, Chemtura, Arkema, DSM, Air Products, and Lyon-

dellBasell, among others. Pharmaceutical firms, including AstraZeneca, Pfizer, and Bristol-Myers Squibb, also cut jobs starting in November.

Many end-of-year layoffs were of production workers, as companies around the world idled or shut plants. But for 2008 as a whole, the number of U.S. production workers actually increased by 2% after nine years of consistent declines. The biggest increases were in basic chemicals and agricultural chemicals. The only segment that employed fewer production workers in 2008 was

DOW CHEMICAL



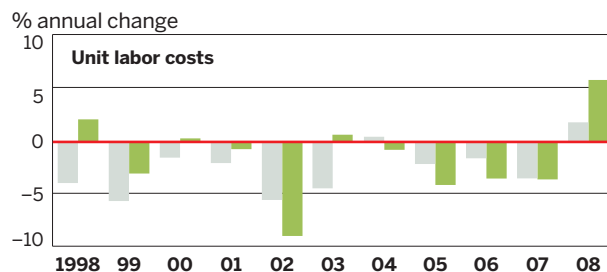
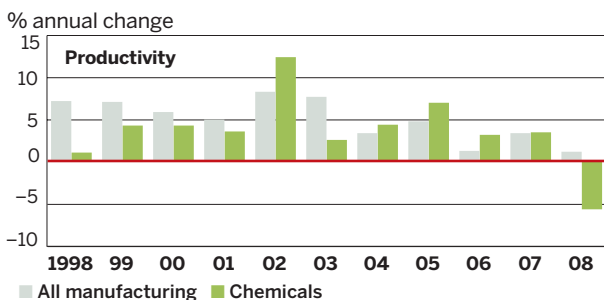
JOB CUTS The recession slammed U.S. construction jobs, as well as companies that sell chemicals and materials to the building industry, like Dow.

paints, coatings, and adhesives, where jobs fell 2.6%. Production of many chemicals used in building materials slowed as the long slide in real estate values led to a decline in new construction.

Weekly pay for U.S. production workers decreased by almost \$11, as companies cut back slightly on hours. But as chemical producers reduced output, productivity fell, a sharp reversal after many years of productivity improvements.

U.S. PRODUCTIVITY

Output per hour dropped for chemical sector, and unit labor costs increased significantly



SOURCE: Federal Reserve Board, Bureau of Labor Statistics, C&EN estimates

EMPLOYMENT

OVERALL U.S. EMPLOYMENT

Downturn in auto production and home building hurt almost all chemical sectors

THOUSANDS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE	
												2007-08	1998-08
Manufacturing	17,560	17,322	17,263	16,441	15,259	14,510	14,315	14,226	14,155	13,879	13,431	-3.2%	-2.6%
Chemicals	993	983	980	959	928	906	887	872	866	861	850	-1.3	-1.5
Basic chemicals	213	195	188	181	170	162	156	150	147	149	152	2.0	-3.3
Resins, synthetic rubber & fibers	140	137	136	126	115	112	110	108	105	106	105	-0.9	-2.8
Agricultural chemicals	50	51	48	46	45	42	42	40	38	36	36	0.0	-3.2
Pharmaceuticals	247	261	274	283	291	292	290	288	292	295	290	-1.7	1.6
Paints, coatings & adhesives	78	78	80	75	72	69	68	68	67	65	63	-3.1	-2.1
Soaps & toiletries	131	131	13	127	121	119	115	114	111	110	108	-1.8	-1.9
Other chemicals	135	128	127	120	114	111	107	104	105	101	95	-5.9	-3.5

NOTE: Average annual domestic employment. SOURCE: Department of Labor

U.S. COMPANY EMPLOYMENT

Despite economic woes, total employment at chemical firms dropped only slightly

THOUSANDS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Air Products & Chemicals	16.7	17.4	17.5	17.8	17.2	18.5	19.9	20.2	20.7	22.1	21.1
Albemarle	2.7	2.6	2.5	3.0	3.0	3.0	3.7	3.7	3.6	4.1	4.1
Cabot	4.8	4.5	4.5	4.3	4.5	4.4	4.3	4.4	4.3	4.3	4.3
Chemtura (a)	5.4	8.6	8.3	7.3	6.8	5.5	4.8	6.6	6.2	5.1	4.7
Cytec Industries (b)	5.1	4.9	4.8	4.5	4.3	4.5	4.5	7.3	6.7	6.8	6.7
Dow Chemical (c)	39.0	39.2	41.9	52.7	50.0	46.4	43.2	42.4	42.6	45.9	46.1
DuPont	101.0	94.0	93.0	79.0	79.0	81.0	60.0	60.0	59.0	60.0	60.0
Eastman Chemical	15.9	14.7	14.6	15.8	15.7	15.0	12.0	12.0	11.0	10.8	10.5
H.B. Fuller	6.0	5.4	5.2	4.9	4.6	4.5	4.5	4.0	3.7	3.2	3.1
Georgia Gulf (d)	1.1	1.4	1.3	1.2	1.2	1.2	1.2	1.1	6.7	5.2	4.5
W.R. Grace	6.6	6.3	6.3	6.4	6.4	6.3	6.4	6.4	6.4	6.5	6.3
Lubrizol (e)	4.3	4.1	4.4	4.5	5.2	5.0	7.8	7.5	6.7	6.9	7.0
NewMarket Corp. (f)	1.5	1.5	1.5	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.3
PPG Industries (g)	32.5	33.8	35.6	34.9	34.1	32.9	31.8	30.8	32.2	34.9	44.9
Praxair	24.8	24.1	23.4	24.3	25.0	25.4	27.0	27.3	27.0	28.0	26.9
Rohm and Haas	11.3	21.5	18.5	18.2	17.6	17.3	16.7	16.5	15.8	15.7	15.5
Solutia	8.7	10.6	10.2	9.2	7.3	6.3	5.7	5.4	5.1	6.0	3.7
Stepan	1.4	1.4	1.4	1.5	1.5	1.4	1.4	1.5	1.5	1.5	1.6
TOTAL EMPLOYEES (h)	301.2	307.4	304.7	300.3	289.6	285.0	261.0	262.9	264.7	272.9	272.3

NOTE: Data are not restated for acquisitions, divestitures, or similar developments. a Crompton and Great Lakes Chemical merged in 2005 to form Chemtura; earlier figures are for Crompton. b Acquired Surface Specialties in 2005. c Merged with Union Carbide in 2001. d Acquired Royal Group in 2006. e Acquired Noveon in 2004. f Formerly Ethyl Corp. g Acquired Sigma Kalon Group in 2008. h For companies reporting. SOURCE: Company data

CANADA COMPANY EMPLOYMENT

Agrium's acquisition of a fertilizer distribution firm in 2008 boosted its payroll

THOUSANDS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Agrium (a)	4.5	4.5	4.0	4.0	4.8	4.7	4.6	4.7	6.6	6.6	11.0
Methanex	0.9	0.8	0.8	0.8	0.8	0.7	0.9	0.8	0.8	0.8	0.9
Nova Chemicals (b)	3.3	4.7	4.7	4.6	4.3	4.3	4.1	3.6	3.3	2.8	2.9
PotashCorp.	5.7	5.5	5.3	5.0	5.2	4.9	4.9	4.9	4.9	5.0	5.3
TOTAL EMPLOYEES (c)	14.4	15.5	14.8	14.4	15.1	14.6	14.5	14.0	15.6	15.2	20.1

a Purchased Royster-Clark in 2006 and United Agri Products in 2008. b Formed a styrenics joint venture with Ineos in 2007. c For companies reporting. SOURCE: Company data

EUROPE COMPANY EMPLOYMENT

AkzoNobel's acquisition of ICI helped build employment for the group

THOUSANDS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Air Liquide (France)	28.6	29.0	30.3	30.8	30.8	31.9	35.9	35.9	36.9	40.3	43.0
AkzoNobel (Netherlands) (a)	68.9	70.7	69.8	70.4	60.7	64.6	61.5	61.3	61.9	42.6	60.0
Altana (Germany) (b)	ne	ne	ne	ne	ne	ne	ne	ne	4.5	4.6	4.8
Arkema (France) (c)	ne	ne	ne	ne	ne	ne	18.6	17.7	17.0	15.2	14.8
BASF (Germany)	105.9	104.6	103.3	92.5	89.4	87.2	82.0	80.9	95.2	95.2	96.9
Bayer (Germany)	145.1	120.4	122.1	116.9	122.6	94.9	93.3	93.7	106.0	106.2	108.6
Ciba (Switzerland)	24.5	20.1	20.3	19.7	19.0	18.7	19.3	19.1	14.1	13.3	12.5
Clariant (Switzerland)	29.3	29.0	31.5	28.9	27.8	27.0	24.8	23.4	21.7	20.3	20.1
DSM (Netherlands)	23.0	21.8	21.8	21.5	18.5	26.1	24.5	22.8	22.2	23.3	23.6
Givaudan (Switzerland) (d)	ne	4.9	5.1	5.3	5.8	6.0	5.9	5.9	6.1	8.8	8.8
Kemira (Finland)	10.8	10.7	9.6	10.2	10.4	10.5	9.7	7.7	9.3	10	9.4
Lanxess (Germany) (e)	ne	ne	ne	ne	ne	20.5	19.7	18.3	16.5	14.6	14.8
Linde (Germany)	33.4	35.6	47.1	46.4	46.0	46.2	41.4	42.2	55.5	50.5	51.9
Lonza (Switzerland) (f)	5.7	5.7	4.6	6.2	6.2	5.7	5.7	6.0	6.1	7.7	8.5
Merck (Germany)	28.9	32.7	33.5	34.3	34.5	34.2	28.9	29.1	30.0	31.0	32.8
Rhodia (France) (g)	24.5	24.8	29.4	26.9	24.5	23.0	20.6	19.4	17.1	15.5	14.4
Solvay (Belgium)	33.1	32.8	32.3	29.4	30.3	30.1	29.3	28.7	29.3	28.3	29.4
Syngenta (Switzerland) (h)	ne	23.5	21.0	20.5	20.0	19.1	19.5	19.0	19.5	21.2	24.1
Wacker (Germany) (i)	ne	ne	ne	ne	ne	ne	14.7	14.4	14.7	15.0	15.9
TOTAL EMPLOYEES (j)	561.7	566.3	581.7	559.9	546.5	545.7	555.3	545.5	583.6	563.6	594.3

a Divested pharmaceuticals in 2007 and purchased ICI in 2008. **b** Divested pharmaceuticals in 2006. **c** Spun off from Total in 2006; prior figures are pro forma. **d** Spun off from Roche in 2000; prior figures are pro forma. **e** Spun off from Bayer in January 2005; prior figures are pro forma. **f** Became a publicly traded company in 1999; prior figures are pro forma. **g** Spun off from Rhône-Poulenc in 1998; prior figures are pro forma. **h** Became a publicly traded company in 2000; prior figures are pro forma. **i** Became a publicly traded company in 2005. **j** For companies reporting. **ne** = nonexistent. **SOURCE:** Company data

JAPAN COMPANY EMPLOYMENT

Overall headcount went up in 2008, led by increases at Mitsubishi and Sumitomo

THOUSANDS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Asahi Kasei	29.3	26.6	26.7	26.2	25.7	25.0	23.8	23.0	23.7	23.9	24.2
DIC (a)	25.7	31.0	30.3	28.4	27.0	26.5	26.8	25.6	25.4	25.2	23.6
JSR Corp. (b)	na	4.4	4.4	4.4	4.3	4.3	4.4	4.6	4.7	5.1	5.3
Kaneka	7.2	6.6	7.0	6.7	6.7	6.6	6.6	7.3	7.4	7.5	7.3
Mitsubishi Chemical (c)	na	33.5	33.0	38.6	37.6	33.5	33.3	33.0	33.4	39.3	41.8
Mitsui Chemicals	12.6	11.7	12.8	13.2	12.7	12.3	12.2	12.5	12.5	12.8	12.0
Shin-Etsu Chemical	18.4	18.8	19.4	16.5	16.6	17.4	18.2	18.9	19.2	20.2	19.2
Showa Denko	13.5	12.5	13.2	12.0	10.9	10.6	11.2	11.1	11.2	11.3	11.8
Sumitomo Chemical	15.8	17.5	17.4	17.0	17.9	19.0	20.2	24.2	24.7	25.6	26.9
Taiyo Nippon Sanso (d)	na	7.0	6.3	5.5	4.8	4.6	7.1	7.3	8.3	8.7	9.0
Teijin	17.2	22.0	22.3	24.0	23.3	20.6	19.0	18.8	19.1	19.1	19.4
Toray	34.3	35.5	35.7	34.9	33.8	32.9	33.7	34.7	36.6	38.6	37.9
TOTAL (e)	173.9	218.9	227.2	225.7	219.7	211.7	216.4	220.9	226.1	237.3	238.4

NOTE: Fiscal year ends March 31 of the following year at all companies, except Showa Denko, where it ends Dec. 31. **a** Formerly Dainippon Ink & Chemicals. **b** Initiated a consolidated headcount in 1999. **c** Absorbed subsidiary firm Mitsubishi Tanabe Pharma in 2008. **d** Became Taiyo Nippon Sanso in 2004 when it acquired Taiyo Toyo Sanso. **e** For companies reporting. **na** = not available. **SOURCE:** Company data

U.S. PRODUCTION WORKERS

The number of workers increased slightly, while overall manufacturing employment continued to shrink

THOUSANDS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE	
												2007-08	1998-08
Manufacturing	12,729	12,524	12,428	11,677	10,768	10,190	10,072	10,060	10,137	9,975	9,649	-3.3%	2.7%
Chemicals	601	595	588	562	532	525	520	510	508	504	514	2.0	-1.6
Basic chemicals	136	126	122	115	104	100	95	86	83	88	96	9.1	-3.4
Resin, synthetic rubber & fibers	98	96	96	89	81	78	75	71	70	70	70	0.0	-3.3
Agricultural chemicals	34	34	32	30	30	29	29	29	29	25	26	4.0	-2.6
Pharmaceuticals	123	129	132	132	128	133	139	144	149	153	159	3.9	2.6
Paints, coatings & adhesives	40	41	42	39	38	37	40	41	39	38	37	-2.6	-0.8
Soaps & toiletries	84	85	82	80	76	77	74	73	72	69	70	1.4	-1.8

NOTE: Average annual domestic employment. SOURCE: Department of Labor

U.S. PAY

No chemical sectors gave workers a significant pay raise in 2008

	HOURLY EARNINGS				WEEKLY EARNINGS			
	2005	2006	2007	2008	2005	2006	2007	2008
Manufacturing	\$16.56	\$16.80	\$17.26	\$17.74	\$691.02	\$691.02	\$711.56	\$724.23
Chemicals	19.67	19.60	19.55	19.49	833.67	833.51	819.54	808.80
Basic chemicals	23.80	23.20	23.23	23.30	1,033.35	1,033.18	1,010.21	1,030.54
Resin, synthetic rubber & fibers	19.03	19.87	21.04	20.54	868.94	868.94	911.97	881.42
Agricultural chemicals	20.87	21.04	21.62	20.36	978.64	978.64	960.05	831.35
Pharmaceuticals	21.31	21.34	20.35	20.10	890.75	890.75	840.75	821.17
Paints, coatings & adhesives	16.31	16.06	15.97	16.49	676.51	676.51	668.18	689.10
Soaps & toiletries	15.37	15.03	15.21	15.21	604.75	604.75	601.55	587.88
Other chemicals	17.15	16.72	16.23	16.08	695.51	695.51	668.97	652.30

NOTE: For production workers in domestic employment. SOURCE: Department of Labor

U.S. PRODUCTIVITY

After years of increasing chemical productivity, lower production reversed the trend in 2008 ...

PRODUCTIVITY (a), 2004 = 100	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE,
												2007-08
Manufacturing	70.1	75.9	80.1	83.8	90.3	96.9	100.0	104.3	105.1	108.1	109.2	1.0%
Chemicals	74.6	77.6	80.8	83.5	93.7	96.0	100.0	106.8	110.1	113.8	107.4	-5.6
Basic chemicals	59.5	70.0	71.0	68.1	80.5	87.0	100.0	115.1	117.6	117.6	99.6	-15.3
Resin, synthetic rubber & fibers	81.5	84.0	84.2	84.3	95.0	96.3	100.0	110.9	111.9	113.5	102.4	-9.8
Agricultural chemicals	89.3	80.5	84.5	85.1	91.5	96.4	100.0	104.4	111.2	125.2	120.6	-3.7
Pharmaceuticals	94.1	91.6	92.4	97.2	103.7	102.6	100.0	101.6	105.0	105.5	101.0	-4.3
Paints, coatings & adhesives	97.5	95.3	95.0	102.4	102.8	107.3	100.0	99.4	97.6	102.0	101.1	-0.9
Soaps & toiletries	70.3	66.8	73.4	75.9	90.9	86.9	100.0	110.3	115.4	118.9	122.5	3.0

... and labor costs grew in most sectors, with basic chemicals seeing the largest jump

UNIT LABOR COSTS (b), 2004 = 100	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE,
												2007-08
Manufacturing	118.7	113.0	110.7	109.1	104.8	100.5	100.0	98.3	99.0	98.9	100.6	1.7%
Chemicals	113.6	110.2	110.4	109.7	100.1	100.6	100.0	96.1	92.9	89.6	94.7	5.7
Basic chemicals	149.6	125.5	128.2	135.9	117.2	109.8	100.0	89.3	85.2	85.3	101.1	18.5
Resin, synthetic rubber & fibers	108.4	107.8	111.3	113.4	102.6	101.7	100.0	94.0	97.3	101.7	110.0	8.2
Agricultural chemicals	87.6	100.8	101.1	108.0	109.5	100.9	100.0	105.6	100.0	91.2	89.2	-2.2
Pharmaceuticals	82.9	86.4	89.5	87.5	83.6	92.2	100.0	100.3	97.2	92.3	95.2	3.1
Paints, coatings & adhesives	84.2	88.3	91.3	88.7	93.5	91.8	100.0	100.9	101.2	96.2	100.3	4.3
Soaps & toiletries	116.7	130.2	127.5	126.3	106.5	110.6	100.0	94.6	88.4	86.8	84.3	-2.9

a Productivity is output per hour, calculated by dividing indexes for production by indexes for workhours of production employees. b Unit labor costs are calculated by dividing indexes for hourly wages by indexes for output per workhour. SOURCES: Federal Reserve Board, Department of Labor