CHEMICAL OUTPUT SLIPPED IN MOST REGIONS

Drops of 10% or more in **PRODUCTION** were common as buyers whittled down inventories

CHEMICAL PRODUCTION saw large decreases in 2008 as companies responded to lower demand from battered customers throughout the economy. Output declined in North America, Europe, and many parts of Asia. Compared with recent steady increases in output—especially the strong growth of 2006 and the slightly smaller gain in 2007—the 2008 numbers show a significant change.

In the U.S., chemical production began a slow slide in January that continued through the summer. Plant shutdowns precipitated by two giant hurricanes caused a particularly large dip in output in September. In 2005, Hurricanes Katrina and Rita caused a similar zigzag in the chart. This time, though, when the facilities came back on-line, the economic collapse was in full swing. Production blipped up and then continued its decline until December.

For the year, although production of all manufacturing goods dropped 3.1%, production of chemicals fell by 4.6%. Customers did not reorder chemicals but instead chose to conserve cash by depleting inventories.

Chemical plant use as a percentage of capacity—also known as capacity utilization—dipped well below the low point of the last recession in 2001, mirroring the trend in manufacturing overall. Total manufacturing capacity utilization slipped to 68.9% at the end of 2008 compared with 78.7% at the end of 2007. Meanwhile, chemical capacity utilization fell to 67.4% at the end of 2008 versus 78.7% at the end of 2007.

Almost all categories of U.S. chemical production saw large decreases, reversing a multiyear trend of modest gains. Production volumes of many chemicals were off by 10% or more. Organic chemicals for which output was down more than 10% were acrylonitrile, benzene, 1,3-butadiene, ethylbenzene, ethylene, ethylene oxide, and styrene. In inorganics, those with big declines included ammonia, ammonium sulfate, chlorine, phosphoric acid, and sulfuric acid.

In addition, all U.S. plastics categories were down more than 10% because the economic downturn hit the automotive and housing sectors particularly hard. This year, the U.S. plastics table (see page 57) no longer includes epoxy, urea, melamine, and phenolic thermoset resins. Also missing are two thermoplastic categories: acrylonitrile-butadiene-styrene and other styrene polymers, and polyamine. The American Plastics Council says a number of producers declined to provide data for the now-missing categories.

For the U.S. fiber industry, a multiyear production decline accelerated. Nylon output was down 22.3%, and output for both olefin and polyester fibers fell more than 14%.

To take advantage of the agriculture boom, U.S. fertilizer makers increased production of ammonium sulfate by 8.2%. But 2008 output volumes of ammonium nitrate, urea, diammonium phosphate, and phosphoric acid were lower than in 2007.

Canada also made strong gains in some fertilizer production for the year. For example, ammonium nitrate production gained 7.5%, moving up to 1.3 million metric tons. But the country's basic chemicals output shrank 3.8%, bringing production levels to what they were 10 years ago. In organics, Canada produced significantly less benzene, formaldehyde, and propylene in 2008 than in 2007.

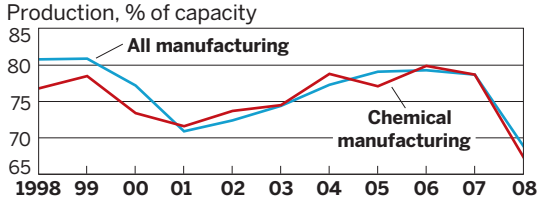
Other data about Canada's production have become harder to come by. Statistics Canada discloses production figures only when a minimum number of companies report data. With the closure of an ethylene plant in Quebec, authorities can no longer report ethylene data, even though it is one of the country's most important chemical commodities. The vast majority of ethylene produced in Canada goes to make polyethylene, and output of polyethylene declined 12.2% in 2008.

IN EUROPE, barriers to obtaining production data are even higher. In past years, C&EN has calculated an estimated output for all of Europe based on those of several large producing countries. But as the countries that report data in a timely fashion have dwindled down to one, Germany, C&EN has decided to provide the most up-to-date figures possible, which are for 2007. These numbers, of course, do not reflect the economic downturn.

Even so, C&EN found reliable 2008 data for a few European chemicals. Ac-

U.S. PLANT USE

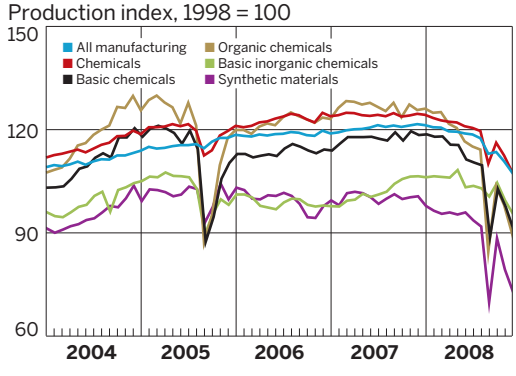
Chemical manufacturing capacity use dropped in 2008



NOTE: As of December. **SOURCE:** Federal Reserve Board

U.S. PRODUCTION

Output plummeted in all chemical sectors



NOTE: Seasonally adjusted. **SOURCE:** Federal Reserve Board

cording to the trade association Euro-Chlor, European chlorine production fell by 4.7% in 2008 to 10.1 million metric tons. And according to the Association of Petrochemical Producers in Europe, ethylene production decreased 8.4% to 20.0 million metric tons.

In Asia, as in previous years, C&EN was unable to obtain output numbers for India and got only a handful of statistics from China. But data from Japan, Taiwan, and South Korea show that the region's chemical industry declined last year.

In Japan, total production of chemicals sank nearly 7% in 2008. Large-volume chemicals were particularly affected, with production of petrochemicals shrinking by a sizable 9.9%. Output of many major chemicals in Japan was lower in 2008 than it was 10 years ago.

South Korea, which exports much of its output to China, saw overall production increase, but by a lot less than in previous years. Production of ethylene, propylene, and their corresponding polymers was up. Output of the engineering plastic acrylonitrile-butadiene-styrene, however, fell significantly.

In Taiwan, plastics production plunged; output of most major plastics was down by more than 10%. Taiwan's petrochemical industry declined more than 5% overall.

Even in China, output of some major chemicals reversed the regional trend by going down. Production of ethylene, which had grown by more than 10% per year over the previous decade, dipped 2.1% in 2008. Benzene's story was similar: Production was down slightly in 2008, a big change from 10 years of growth at an annual rate of more than 11%.

U.S. PRODUCTION INDEX

Total chemical output declined almost 5% after six years of increases

PRODUCTION INDEX, 2004 = 100	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE 2007-08	ANNUAL CHANGE 1998-08
Total index	**91.8**	**95.8**	**99.9**	**96.4**	**96.3**	**97.5**	**100.0**	**103.3**	**105.6**	**107.2**	**104.8**	**-2.2%**	**1.3%**
All manufacturing	**90.2**	**94.8**	**99.2**	**95.3**	**95.5**	**97.0**	**100.0**	**104.2**	**107.0**	**108.7**	**105.3**	**-3.1**	**1.6**
Nondurable manufacturing	**99.0**	**99.7**	**100.3**	**97.0**	**98.1**	**98.2**	**100.0**	**102.8**	**103.6**	**104.7**	**101.6**	**-3.0**	**0.3**
Chemicals	**86.9**	**88.6**	**90.0**	**88.4**	**94.7**	**95.9**	**100.0**	**103.5**	**106.7**	**108.0**	**103.0**	**-4.6**	**1.7**
Basic chemicals	**90.5**	**95.0**	**91.7**	**82.5**	**88.8**	**91.4**	**100.0**	**101.5**	**102.7**	**106.2**	**97.8**	**-7.9**	**0.8**
Basic inorganic chemicals	**100.9**	**102.6**	**95.3**	**91.3**	**100.2**	**100.1**	**100.0**	**103.7**	**100.1**	**103.0**	**104.8**	**1.7**	**0.4**
Alkalis & chlorine	56.9	74.3	68.7	57.8	92.0	86.5	100.0	112.8	94.8	99.7	89.8	-9.9	4.7
Synthetic dyes & pigments	99.2	95.8	98.8	91.6	104.4	105.0	100.0	104.3	106.2	94.4	81.5	-13.7	-1.9
Other basic inorganic chemicals	103.9	109.7	99.6	95.4	101.3	98.6	100.0	102.5	95.8	102.3	103.4	1.1	0.0
Organic chemicals	**85.1**	**91.5**	**90.4**	**78.0**	**82.7**	**86.9**	**100.0**	**100.6**	**103.8**	**107.6**	**95.0**	**-11.7**	**1.1**
Synthetic materials (a)	**105.8**	**106.8**	**104.8**	**94.6**	**97.3**	**95.4**	**100.0**	**106.1**	**104.8**	**105.6**	**94.1**	**-10.9**	**-1.2**
Plastic materials & resins	98.5	102.3	101.6	92.1	97.0	93.0	100.0	109.3	108.3	109.3	96.2	-12.0	-0.2
Artificial & synthetic fibers	143.3	129.3	120.6	112.4	99.5	104.1	100.0	89.9	88.8	85.2	71.2	-16.4	-6.8
Chemical products	**88.8**	**88.9**	**93.2**	**89.4**	**96.3**	**94.1**	**100.0**	**103.3**	**104.3**	**103.3**	**101.9**	**-1.4**	**1.4**
Pharmaceuticals & medicines	76.6	79.7	82.9	89.2	96.2	99.5	100.0	104.0	110.6	112.9	110.8	-1.9	3.8
Soap, cleaning compounds & toiletries	80.9	77.7	80.2	81.6	92.9	89.3	100.0	107.5	112.9	108.8	111.0	2.0	3.2
Paint & coatings	99.8	97.8	97.5	95.4	95.6	94.3	100.0	97.6	91.7	90.4	83.4	-7.7	-1.8
Pesticides, fertilizers & other agricultural chemicals	**112.4**	**101.3**	**95.6**	**88.0**	**91.0**	**95.3**	**100.0**	**104.1**	**110.8**	**103.7**	**94.4**	**-9.0**	**-1.7**

a Includes synthetic rubber. **SOURCE:** Federal Reserve Board

CANADA PRODUCTION INDEX

In 2008, basic chemicals manufacturing fell back to where it was a decade before

PRODUCTION INDEX, 2004 = 100	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE 2007-08	ANNUAL CHANGE 1998-08
All manufacturing	**85.8**	**92.8**	**103.2**	**98.1**	**98.9**	**98.1**	**100.0**	**101.6**	**101.1**	**100.1**	**94.0**	**-6.0%**	**0.9%**
Chemicals	**78.6**	**81.9**	**91.1**	**93.2**	**97.2**	**99.9**	**100.0**	**101.3**	**102.0**	**101.7**	**99.7**	**-1.9**	**2.4**
Basic chemicals	96.6	96.1	110.5	110.5	109.2	107.5	100.0	101.4	105.7	100.4	96.6	-3.8	0.0
Pharmaceuticals & medicines	50.4	58.8	70.7	92.2	105.4	110.5	100.0	98.4	106.1	104.0	109.1	4.9	8.0

SOURCE: Statistics Canada

ASIA PRODUCTION INDEX

Chemical output held up in South Korea but dropped sharply in Taiwan and Japan

PRODUCTION INDEX, 2004 = 100	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE 2007-08	ANNUAL CHANGE 1998-08
JAPAN													
Mining & manufacturing	**94.7**	**95.4**	**100.9**	**95.9**	**91.8**	**94.8**	**100.0**	**101.1**	**105.6**	**108.6**	**104.9**	**-3.4%**	**1.0%**
All chemicals (a)	**96.2**	**99.6**	**100.2**	**97.1**	**97.1**	**98.6**	**100.0**	**100.6**	**100.3**	**102.3**	**95.5**	**-6.6**	**-0.4**
Petrochemicals	93.6	98.2	98.1	93.6	94.5	97.4	100.0	101.0	99.0	102.2	92.1	-9.9	-0.6
Aromatics	85.5	91.8	91.1	88.9	91.7	96.9	100.0	104.6	104.4	107.7	97.8	-9.1	0.6
Industrial sodium chemicals	102.1	103.6	104.7	97.0	98.7	100.0	100.0	100.8	98.3	98.4	95.5	-2.9	-0.8
Inorganic chemicals & dyes	89.8	95.0	98.1	93.5	95.5	97.6	100.0	101.2	99.5	100.6	98.1	-2.4	0.3
Organic chemicals	95.9	101.2	99.9	93.6	93.9	99.3	100.0	101.4	98.8	102.7	90.0	-12.3	-1.2
Cyclic intermediates & dyes	96.1	99.2	98.7	94.9	96.6	97.6	100.0	97.0	95.4	96.4	83.1	-13.9	-1.8
Plastics	**97.8**	**100.6**	**102.2**	**96.5**	**96.5**	**96.9**	**100.0**	**100.0**	**99.6**	**100.1**	**91.7**	**-8.4**	**-0.9**
Synthetic rubber	**93.5**	**97.0**	**97.9**	**90.1**	**94.1**	**97.6**	**100.0**	**100.6**	**99.4**	**102.3**	**102.1**	**-0.2**	**0.5**
Fertilizers	**130.2**	**126.2**	**124.7**	**115.5**	**107.4**	**99.5**	**100.0**	**98.2**	**96.5**	**95.7**	**90.6**	**-5.3**	**-3.3**
SOUTH KOREA													
All manufacturing	**54.1**	**67.7**	**79.2**	**79.4**	**85.9**	**90.5**	**100.0**	**106.2**	**115.4**	**123.6**	**127.3**	**3.0%**	**8.3%**
Chemicals & chemical products	**71.8**	**79.2**	**84.0**	**86.3**	**91.8**	**95.3**	**100.0**	**103.1**	**105.7**	**113.0**	**113.8**	**0.7**	**4.4**
Rubber & plastic products	68.9	81.0	86.4	88.6	94.4	96.8	100.0	102.0	108.9	115.3	111.4	-3.4	4.7
TAIWAN													
All manufacturing	**72.1**	**77.7**	**83.8**	**76.2**	**83.0**	**90.9**	**100.0**	**103.7**	**108.3**	**117.4**	**115.5**	**-1.6%**	**4.8%**
Chemicals	**49.7**	**54.0**	**57.3**	**65.4**	**73.8**	**85.3**	**100.0**	**104.0**	**98.1**	**99.4**	**90.4**	**-9.1**	**6.2**
Basic chemicals	64.0	69.6	77.6	78.9	80.5	88.4	100.0	101.5	118.9	122.2	117.6	-3.7	6.3
Petrochemicals	46.1	54.0	59.7	72.1	80.9	92.1	100.0	102.6	104.4	123.8	117.2	-5.3	9.8
Fertilizers	130.8	120.4	115.7	108.0	103.4	103.2	100.0	107.1	108.5	110.0	105.1	-4.4	-2.2
Man-made fibers	90.7	92.5	96.1	93.0	100.3	98.8	100.0	87.5	84.4	81.2	65.2	-19.7	-3.2
Plastics & resins	74.2	81.2	84.7	84.9	91.2	95.8	100.0	98.1	98.6	107.2	95.7	-10.7	2.6
Synthetic rubber	80.0	84.5	79.4	81.8	89.8	93.8	100.0	99.0	103.1	113.0	105.1	-7.0	2.8

a Excludes pharmaceuticals. **SOURCES:** Japan's Ministry of Economy, Trade & Industry; Korea National Statistical Office, Republic of Korea; Taiwan's Ministry of Economic Affairs

U.S. ORGANICS

Only aniline showed a modest rise in 2008; all others declined

THOUSANDS OF METRIC TONS UNLESS OTHERWISE INDICATED	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE 2007-08	ANNUAL CHANGE 1998-08
Acrylonitrile	1,415	1,415	1,551	1,343	1,239	1,501	1,598	1,323	1,371	1,270	1,018	-19.8%	-3.2%
Aniline	701	719	846	865	921	969	1,034	964	930	978	1,009	3.1	3.7
Benzene (thousands of liters) (a,b)	8,467	9,088	9,156	7,271	8,130	7,926	8,781	7,574	7,642	7,979	6,359	-20.3	-2.8
1,3-Butadiene (c)	1,844	1,942	2,009	1,721	1,869	1,901	2,204	2,046	1,987	2,047	1,633	-20.2	-1.2
Cumene	3,045	3,162	3,741	3,186	3,503	3,397	3,736	3,509	3,559	3,702	3,386	-8.5	1.1
Ethylbenzene	5,743	5,945	5,967	4,642	5,412	5,578	5,779	5,251	5,286	5,538	4,104	-25.9	-3.3
Ethylene	23,614	25,300	25,113	22,513	23,644	22,976	25,682	23,974	25,020	25,412	22,554	-11.2	-0.5
Ethylene dichloride	11,140	10,358	9,911	9,336	9,328	9,994	12,163	11,308	9,732	9,562	8,973	-6.2	-2.1
Ethylene oxide	3,692	4,030	3,867	3,343	3,447	3,660	3,772	3,166	3,445	3,415	2,903	-15.0	-2.4
Propylene (d)	13,014	13,202	14,457	13,176	14,425	13,939	15,345	15,490	15,650	16,187	14,791	-8.6	1.3
Styrene	5,166	5,397	5,405	4,214	4,899	5,167	5,394	5,042	4,827	5,100	4,100	-19.6	-2.3
Urea	8,042	8,080	6,969	6,080	7,038	5,783	5,756	5,268	5,383	5,585	5,288	-5.3	-4.1
Vinyl acetate	1,333	1,378	1,497	1,188	1,349	1,306	1,431	1,327	1,315	1,391	1,267	-8.9	-0.5

a Production by tar distillers and coke-oven operators is not included. **b** Specification grades. **c** Rubber grade. **d** All grades.
SOURCES: National Petrochemical & Refiners Association, Bureau of the Census

CANADA ORGANICS

Output of many products dropped significantly in 2008

THOUSANDS OF METRIC TONS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE 2007-08	ANNUAL CHANGE 1998-08
Benzene	718	805	859	751	849	843	915	798	743	794	704	-11.3%	-0.2%
Butadiene	236	230	252	245	276	276	289	246	262	234	na	na	na
Ethylene	3,557	3,881	4,069	4,261	4,734	4,729	5,095	na	na	5,055	na	na	na
Formaldehyde	228	211	194	179	212	245	269	na	236	195	165	-15.4	-3.2
Propylene	1,038	1,000	934	882	956	938	939	737	833	917	771	-15.9	-2.9
Toluene	222	260	218	222	256	289	na	na	253	211	na	na	na
Urea	3,714	3,783	3,887	3,363	3,436	3,311	3,654	3,549	na	3,574	3,837	7.4	0.3
Xylenes	308	253	312	271	294	336	351	na	na	na	na	na	na

NOTE: Some data are now not being released because of confidentiality requirements. **na** = not available. **SOURCE:** Statistics Canada

EUROPE ORGANICS

Major products such as ethylene and propylene showed steady gains in 2007

THOUSANDS OF METRIC TONS	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	ANNUAL CHANGE, 2006-07
Acetic acid	781	584	593	754	495	716	676	1,451	1,500	866	869	0.3%
Acetone	1,173	1,254	1,307	1,325	404	1,011	1,235	1,567	1,336	1,536	1,628	6.0
Benzene	3,561	3,345	3,705	4,565	6,670	6,817	6,535	7,931	7,089	6,052	6,072	0.3
Butadiene	1,939	1,971	2,027	2,097	1,992	2,024	2,131	2,222	2,233	2,182	2,188	0.3
1-Butanol	164	188	44	67	531	575	542	788	816	417	419	0.5
Ethylbenzene	679	684	937	149	1,180	769	911	4,262	4,276	1,146	1,131	-1.3
Ethylene	18,537	18,980	19,362	19,444	19,674	20,159	20,686	21,408	21,600	21,192	21,818	3.0
Ethylene dichloride	902	860	1,056	1,122	2,759	3,358	3,374	6,044	6,646	1,407	1,452	3.2
Ethylene glycol	506	1,171	1,177	1,195	268	239	857	1,404	1,637	1,470	1,501	2.1
Ethylene oxide	634	644	592	637	934	717	792	2,311	2,397	640	772	20.6
Formaldehyde	808	824	947	954	2,463	3,299	3,295	4,017	4,057	1,076	1,231	14.4
Methanol	2,365	2,242	869	1,148	2,030	1,844	2,009	2,878	3,248	2,395	2,100	-12.3
Phenol	na	1,391	na	na	689	797	724	2,059	2,005	2,189	2,182	-0.3
Phthalic anhydride	414	446	446	488	371	442	430	848	852	475	459	-3.4
Propylene	12,624	12,885	13,153	13,330	13,352	14,107	14,708	15,123	15,406	15,291	15,670	2.5
Propylene glycol	361	351	429	443	316	305	329	1,987	2,179	723	586	-18.9
Propylene oxide	819	727	845	908	735	777	861	666	950	2,012	2,091	3.9
Styrene	3,025	3,152	2,989	3,215	958	3,078	3,215	6,220	4,963	4,380	4,598	5.0
Toluene	209	1,130	1,172	1,155	886	919	848	1,913	2,014	1,699	1,744	2.6
Vinyl acetate	391	469	718	644	457	667	502	881	800	910	946	4.0
Xylenes	1,368	2,514	2,497	2,602	579	1,122	626	4,382	4,282	4,257	3,867	-9.2

NOTE: Data for 2008 are not available. Data from 2005 forward are for 27 countries in the European Union; between 2002 and 2005, for 25 countries; and prior to 2002, for 15 countries. Thus, 10-year comparisons are not meaningful. **na** = not available.
SOURCES: European Union, national government statistics offices, Association of Petrochemical Producers in Europe

CHINA ORGANICS

Production uncharacteristically leveled off in 2008

THOUSANDS OF METRIC TONS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE 2007-08	ANNUAL CHANGE 1998-08
Benzene (pure)	1,341	1,535	1,850	1,988	2,131	2,408	2,556	3,061	3,441	4,069	4,034	-0.9%	11.6%
Caprolactam	120	109	164	152	170	201	228	214	291	299	290	-3.0	9.2
Ethylene	3,772	4,348	4,743	4,807	5,414	6,118	6,266	7,555	8,765	10,477	10,256	-2.1	10.5
Methanol (refined)	1,581	1,794	1,967	2,065	2,110	2,989	4,406	5,356	7,623	10,764	11,263	4.6	21.7

SOURCE: China National Chemical Information Center

ASIA ORGANICS

Overall output held steady in South Korea but fell precipitously in Taiwan and Japan

THOUSANDS OF METRIC TONS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE 2007-08	ANNUAL CHANGE 1998-08
JAPAN													
Acetic acid	654	644	675	594	569	592	589	599	597	587	500	-14.8%	-2.6%
Acetone	459	507	508	476	472	492	539	546	531	593	491	-17.2	0.7
Acrylonitrile	667	738	732	738	708	780	711	742	667	743	600	-19.2	-1.1
Benzene (a)	4,203	4,459	4,425	4,261	4,313	4,551	4,758	4,980	4,874	5,245	4,581	-12.7	0.9
Butadiene	977	1,035	1,044	976	993	1,062	1,041	1,040	1,002	1,024	953	-6.9	-0.2
Butanol	424	495	461	472	476	519	506	513	537	537	482	-10.2	1.3
Caprolactam	519	581	599	531	508	530	503	458	467	467	432	-7.5	-1.8
Cyclohexane	652	688	673	598	607	685	676	722	731	703	557	-20.8	-1.6
Ethylene	7,076	7,687	7,614	7,361	7,152	7,367	7,570	7,618	7,522	7,739	6,882	-11.1	-0.3
Ethylene dichloride	3,491	3,503	3,431	3,275	3,352	3,463	3,594	3,687	3,514	3,603	3,212	-10.9	-0.8
Ethylene glycol	920	922	930	787	733	814	786	841	763	754	629	-16.6	-3.7
Ethylene oxide	953	976	990	891	868	939	941	1,005	974	966	865	-10.5	-1.0
Octanol	285	315	278	262	302	306	307	279	280	270	259	-4.1	-1.0
Phenol	851	888	916	884	891	926	966	938	860	961	772	-19.7	-1.0
Phthalate plasticizers	398	417	396	369	377	382	357	315	279	281	246	-12.5	-4.7
Phthalic anhydride	301	301	290	259	262	262	257	239	175	179	176	-1.7	-5.2
Polypropylene glycol	274	302	304	294	299	314	346	339	344	343	308	-10.2	1.2
Propylene	5,101	5,520	5,453	5,342	5,309	5,610	5,767	6,030	6,090	6,286	5,674	-9.7	1.1
Purified terephthalic acid	1,616	1,547	1,527	1,496	1,624	1,443	1,531	1,472	1,432	1,254	1,015	-19.1	-4.5
Styrene	2,770	3,055	2,968	3,004	3,016	3,201	3,345	3,392	3,295	3,533	2,851	-19.3	0.3
Toluene (a)	1,349	1,488	1,489	1,423	1,548	1,584	1,634	1,676	1,633	1,637	1,435	-12.3	0.6
Toluene diisocyanate	192	192	214	214	223	230	245	216	232	229	224	-2.2	1.6
Xylene (a)	4,340	4,641	4,681	4,798	4,900	5,213	5,395	5,570	5,727	6,006	5,698	-5.1	2.8
p-Xylene	2,754	2,969	2,920	2,814	2,920	3,097	3,164	3,358	3,357	3,301	3,039	-7.9	1.0
SOUTH KOREA													
Benzene	2,412	2,572	2,834	2,650	2,852	3,246	3,462	3,594	3,719	4,065	4,006	-1.5	5.2
Butadiene	731	764	808	777	816	860	917	939	948	1,078	1,072	-0.6	3.9
Ethylene	5,110	5,216	5,439	5,398	5,636	5,872	5,945	6,058	6,055	6,788	6,989	3.0	3.2
Propylene	3,247	3,282	3,409	3,273	3,557	3,753	3,892	3,945	4,172	4,669	4,772	2.2	3.9
Vinyl chloride	984	1,017	1,133	1,392	1,416	1,441	1,498	1,501	1,521	1,512	1,473	-2.6	4.1
TAIWAN													
Acrylonitrile	167	175	186	292	339	352	379	386	418	451	360	-20.2	8.0
Benzene	415	605	690	1,070	931	998	1,088	1,204	1,180	1,606	1,550	-3.5	14.1
Butadiene	122	190	220	349	346	390	412	387	394	521	513	-1.5	15.4
Caprolactam	123	119	171	184	186	216	216	247	257	257	216	-16.0	5.8
Dioctyl phthalate	270	269	198	280	257	243	239	204	211	244	189	-22.5	-3.5
Ethylene	935	1,296	1,592	2,584	2,393	2,679	2,864	2,890	2,888	3,666	3,623	-1.2	14.5
Ethylene glycol	206	301	612	1,036	939	1,169	1,459	1,413	1,343	1,795	2,014	12.2	25.6
Propylene	545	765	930	1,410	1,462	1,752	1,995	2,012	2,105	2,835	2,663	-6.1	17.2
Purified terephthalic acid	2,433	2,769	3,140	3,217	3,705	4,079	4,620	4,597	4,400	4,437	4,096	-7.7	5.3
Styrene	386	806	956	1,146	1,249	1,274	1,247	1,248	1,222	1,824	1,679	-7.9	15.8
Toluene	23	18	26	54	42	64	140	86	30	36	16	-55.6	-3.6
Vinyl chloride	1,018	1,288	1,410	1,452	1,557	1,718	1,763	1,783	1,609	1,810	1,633	-9.8	4.8

a Petroleum and nonpetroleum sources. **SOURCES:** Japan's Ministry of Economy, Trade & Industry; Korea National Statistical Office, Republic of Korea; Petrochemical Industry Association of Taiwan; Taiwan's Ministry of Economic Affairs

U.S. INORGANICS

Production of all inorganics decreased, except for nitric acid and sodium sulfate

THOUSANDS OF METRIC TONS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE 2007-08	ANNUAL CHANGE 1998-08
Aluminum sulfate (a)	1,058	1,085	976	1,019	1,053	961	971	967	912	877	865	-1.4%	-2.0%
Ammonia (b)	16,757	15,725	14,339	11,090	12,574	10,466	10,937	10,141	9,960	10,744	9,547	-11.1	-5.5
Ammonium nitrate (c)	8,235	6,920	7,237	5,833	6,436	5,733	6,558	6,541	6,411	7,311	7,279	-0.4	-1.2
Ammonium sulfate	2,528	2,357	2,547	2,347	2,671	2,604	2,726	2,636	2,603	2,835	2,507	-11.6	-0.1
Chlorine	11,647	12,111	12,698	11,487	11,681	10,359	12,326	10,275	10,331	10,791	9,629	-10.8	-1.9
Hydrochloric acid	4,226	4,081	4,278	3,969	4,037	4,179	5,301	4,618	4,232	4,224	3,808	-9.8	-1.0
Nitric acid, 100%	8,421	8,113	7,898	6,416	6,939	6,747	6,466	6,710	6,607	7,381	7,503	1.7	-1.1
Phosphoric acid, P_2O_5	12,599	12,433	11,330	10,472	11,146	11,324	11,511	11,447	10,700	11,000	9,211	-16.3	-3.1
Sodium chlorate	707	742	853	792	721	668	556	523	558	600	547	-8.8	-2.5
Sodium hydroxide	11,893	11,971	10,451	9,811	9,459	8,793	9,618	8,519	8,061	8,046	7,263	-9.7	-4.8
Sodium sulfate (d)	571	599	462	512	500	466	469	467	290	312	322	3.2	-5.6
Sulfuric acid (e)	44,000	40,594	39,584	36,338	36,062	37,373	38,021	37,183	35,909	36,636	32,443	-11.4	-3.0

a Commercial, 17% Al_2O_3; includes production by municipalities. **b** Synthetic anhydrous; excludes by-product ammonia liquor and ammonium sulfate. **c** Original solution. **d** High purity. **e** Gross (new and fortified). **SOURCES:** Department of Commerce, Bureau of the Census

CANADA INORGANICS

Unlike in the U.S., Canadian inorganic chemicals mostly turned in strong gains in 2008

THOUSANDS OF METRIC TONS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE 2007-08	ANNUAL CHANGE 1998-08
Aluminum sulfate	191	205	167	170	176	171	167	175	164	199	224	12.6%	1.6%
Ammonia	4,737	4,889	4,888	4,297	4,501	4,455	4,996	4,607	4,623	4,411	4,730	7.2	-0.0
Ammonium nitrate	1,000	1,052	1,110	1,174	1,152	1,031	1,096	1,206	1,181	1,188	1,277	7.5	2.5
Carbon black	217	218	229	215	215	205	223	235	225	na	na	na	na
Chlorine	989	1,065	1,079	1,054	1,095	994	1,057	1,008	929	601	570	-5.2	-5.4
Hydrochloric acid	149	157	155	143	151	153	149	142	155	138	154	11.6	0.3
Hydrogen peroxide	199	228	237	203	222	226	244	244	na	236	247	4.7	2.2
Nitric acid	935	1,007	1,074	1,054	1,143	1,105	1,219	1,147	1,180	1,132	821	-27.5	-1.3
Sodium chlorate	1,012	1,049	1,107	1,082	1,055	1,129	1,183	1,169	1,111	1,073	1,072	-0.1	0.6
Sodium hydroxide	1,015	1,082	1,094	1,074	1,111	1,059	1,146	1,119	1,012	676	684	1.2	-3.9
Sulfuric acid	4,333	4,194	3,804	3,846	3,887	3,465	3,933	3,743	3,823	3,833	4,098	6.9	-0.6

NOTE: Some data are now not being released because of confidentiality requirements. **na** = not available. **SOURCE:** Statistics Canada

JAPAN INORGANICS

Amid the economic downturn, production of hydrochloric acid, nitrogen, and sulfuric acid rose slightly

THOUSANDS OF METRIC TONS UNLESS OTHERWISE INDICATED	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE 2007-08	ANNUAL CHANGE 1998-08
Ammonia	1,689	1,685	1,715	1,604	1,450	1,291	1,340	1,318	1,328	1,355	1,244	-8.2%	-3.0%
Ammonium sulfate (a)	1,618	1,716	1,749	1,585	1,564	1,570	1,526	1,458	1,439	1,463	1,412	-3.5	-1.4
Carbon black	723	761	788	742	755	788	804	805	827	835	821	-1.7	1.3
Chlorine, liquid	881	875	847	777	754	723	619	601	571	550	520	-5.5	-5.1
Hydrochloric acid	2,408	2,448	2,494	2,342	2,317	2,363	2,324	2,308	2,326	2,343	2,386	1.8	-0.1
Hydrogen peroxide	140	145	151	159	167	176	196	197	221	218	214	-1.8	4.3
Nitrogen (mcm)	9,716	9,855	10,290	10,296	10,455	10,835	11,281	11,435	11,998	12,696	13,211	4.1	3.1
Oxygen (mcm)	9,188	9,534	10,655	10,373	10,720	11,250	11,278	11,371	11,766	12,407	11,941	-3.8	2.7
Sodium hydroxide	4,252	4,345	4,471	4,291	4,271	4,369	4,493	4,552	4,453	4,482	4,368	-2.5	0.3
Sodium silicate	765	769	720	679	622	596	577	546	541	524	471	-10.1	-4.7
Sulfuric acid	6,739	6,943	7,059	6,727	6,763	6,534	6,444	6,546	6,843	7,098	7,227	1.8	0.7
Titanium dioxide	251	269	270	257	240	253	253	259	240	246	225	-8.5	-1.1

a For agricultural and nonagricultural use. **mcm** = millions of cubic meters. **SOURCE:** Ministry of Economy, Trade & Industry

EUROPE INORGANICS

Most inorganic chemicals posted an increase in 2007

THOUSANDS OF METRIC TONS UNLESS OTHERWISE INDICATED	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	ANNUAL CHANGE, 2006-07
Carbon black	1,243	1,386	1,322	1,342	1,059	1,025	1,009	1,468	1,388	1,662	1,871	12.6%
Chlorine	9,386	9,190	9,219	9,697	9,265	9,222	9,525	10,396	10,382	10,315	10,624	3.0
Hydrochloric acid	1,907	1,830	2,098	2,050	2,608	4,142	3,784	5,165	6,002	3,071	3,458	12.6
Hydrogen (mcm)	1,883	2,124	2,252	2,196	5,553	7,519	8,962	10,690	11,251	6,526	8,000	22.6
Hydrogen peroxide	133	248	438	847	372	655	736	1,085	1,123	911	973	6.8
Nitrogen (mcm)	11,950	10,490	7,422	8,091	12,829	13,942	17,807	22,326	22,457	23,123	22,695	-1.9
Oxygen (mcm)	10,610	4,674	5,592	5,965	12,678	19,026	22,554	27,112	27,824	27,754	28,013	0.9
Phosphoric acid (a)	599	526	995	692	2,463	3,921	3,574	4,304	4,257	703	671	-4.6
Sodium carbonate	1,589	4,998	4,567	4,401	1,451	1,493	3,874	6,609	6,956	6,828	6,610	-3.2
Sodium hydroxide	6,197	6,090	5,418	5,780	6,756	9,114	7,937	9,994	9,829	8,773	8,967	2.2
Sodium sulfate	2,718	2,748	2,237	2,314	1,806	2,951	3,082	3,406	3,565	3,221	3,086	-4.2
Sulfuric acid (b)	6,586	6,832	7,109	6,598	8,157	13,835	12,746	16,584	16,609	9,739	9,744	0.1
Titanium oxides	na	415	433	538	na	440	419	588	602	623	626	0.5

NOTE: Data for 2008 are not available. Data from 2005 forward are for 27 countries in the European Union; between 2002 and 2005, for 25 countries; and prior to 2002, for 15 countries. Thus, 10-year comparisons are not meaningful. **a** As P_2O_5. **b** As SO_3. **mcm** = millions of cubic meters. **na** = not available.
SOURCES: European Union, national government statistics offices, EuroChlor

CHINA INORGANICS

Output of sulfuric acid fell, and that of other chemicals grew less than in past years

THOUSANDS OF METRIC TONS	1998	1999	2000	2001	2003	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE 2007-08	ANNUAL CHANGE 1998-08
Hydrochloric acid (31%)	3,801	3,960	4,454	4,705	4,926	5,276	6,007	6,582	7,306	7,476	7,571	1.3%	7.1%
Sodium carbonate	7,368	7,486	9,199	9,144	10,189	11,075	12,668	14,211	15,972	17,718	18,813	6.2	9.8
Sodium hydroxide	5,184	5,495	7,123	7,880	8,227	9,399	10,603	12,400	15,118	17,593	18,522	5.3	13.6
Sulfuric acid	20,519	21,589	23,888	26,963	29,674	33,191	38,249	44,621	48,603	53,907	51,101	-5.2	9.6

SOURCE: China National Chemical Information Center

U.S. PLASTICS

Every category declined, with polypropylene down the most

THOUSANDS OF METRIC TONS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE 2007-08	ANNUAL CHANGE 1998-08
Polyethylene													
Low-density (a,b)	3,437	3,493	3,436	3,491	3,647	3,540	3,763	3,558	3,586	3,596	3,177	-11.7%	-0.8%
Linear low-density (a,b)	3,278	3,677	3,607	4,659	5,139	5,052	5,640	5,395	5,919	6,162	5,469	-11.2	5.3
High-density (b,c)	5,862	6,289	6,336	6,933	7,243	7,125	7,960	7,328	7,966	8,265	7,370	-10.8	2.3
Polypropylene (d)	**6,271**	**7,028**	**7,139**	**7,228**	**7,691**	**8,013**	**8,415**	**8,149**	**8,442**	**8,820**	**7,606**	**-13.8**	**1.9**
Polystyrene (e)	**2,829**	**2,935**	**3,104**	**2,773**	**3,025**	**2,900**	**3,062**	**2,854**	**2,807**	**2,728**	**2,368**	**-13.2**	**-1.8**
Polyvinyl chloride & copolymers (d)	**6,578**	**6,764**	**6,551**	**6,467**	**6,939**	**6,669**	**7,251**	**6,921**	**6,758**	**6,625**	**5,801**	**-12.4**	**-1.2**

a Density 0.940 and below. **b** Data include Canadian production from 2001. **c** Density above 0.940. **d** Data include Canadian and Mexican production. **e** Data include Canadian production from 2000. **SOURCE:** American Plastics Council

CANADA PLASTICS

Plastics production saw a sharp decrease in 2008

THOUSANDS OF METRIC TONS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE 2007-08	ANNUAL CHANGE 1998-08
Polyesters, unsaturated	82	108	120	115	113	139	100	90	81	62	53	-14.5%	-4.3%
Polyethylene (a)	2,283	2,485	2,751	3,035	3,330	3,083	3,587	3,366	3,594	3,736	3,282	-12.2	3.7
Polystyrene (b)	180	200	203	186	195	183	207	198	195	83	na	na	na

NOTE: Some data are now not being released because of confidentiality requirements. **a** Includes high-, low-, and linear low-density polyethylene. **b** Includes acrylonitrile-butadiene-styrene. **na** = not available. **SOURCE:** Statistics Canada

EUROPE PLASTICS

Polyethylene saw a modest increase in 2007

THOUSANDS OF METRIC TONS	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	ANNUAL CHANGE, 2006-07
Polyethylene	8,508	9,731	10,223	10,579	11,487	11,599	11,942	13,859	14,529	13,550	13,957	3.0%
Polystyrene	1,117	1,090	675	331	2,410	2,550	2,540	1,790	1,859	na	na	na
Acrylonitrile-butadiene-styrene	762	859	971	1,038	466	793	495	811	891	690	743	7.7
Polyvinyl chloride	4,792	2,651	3,209	4,893	5,681	6,531	6,694	6,485	6,594	7,008	6,888	-1.7
Epoxy resins	373	334	393	419	215	464	356	633	693	801	798	-0.4
Polypropylene	na	4,158	6,524	6,984	7,526	8,113	8,638	8,950	9,050	na	na	na
Polyamides	1,652	1,494	766	1,412	1,209	1,833	1,769	2,052	2,119	1,940	1,959	1.0
Synthetic rubber	2,419	2,245	2,239	2,342	2,691	3,250	3,713	4,415	4,170	4,391	4,075	-7.2

NOTE: Data for 2008 are not available. Data from 2005 forward are for 27 countries in the European Union; between 2002 and 2005, for 25 countries; and prior to 2002, for 15 countries. Thus, 10-year comparisons are not meaningful. **na** = not available.
SOURCES: European Union, European Chemical Industry Council, national agencies and associations, Association of Plastics Manufacturers in Europe

ASIA PLASTICS

Output shrank across the board, most sharply in Taiwan

THOUSANDS OF METRIC TONS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE 2007-08	ANNUAL CHANGE 1998-08
JAPAN													
Polyethylene	3,143	3,369	3,342	3,294	3,176	3,165	3,238	3,240	3,166	3,232	3,089	-4.4%	-0.2%
Polyethylene terephthalate	1,300	1,281	1,308	1,243	1,211	1,076	1,195	1,126	1,110	1,104	1,052	-4.7	-2.1
Polypropylene	2,520	2,626	2,721	2,696	2,641	2,751	2,908	3,063	3,049	3,087	2,871	-7.0	1.3
Polystyrene	1,975	2,037	2,024	1,810	1,837	1,801	1,824	1,734	1,745	1,749	1,596	-8.7	-2.1
Polyvinyl chloride	2,457	2,460	2,410	2,195	2,225	2,164	2,153	2,151	2,146	2,162	1,797	-16.9	-3.1
Epoxy resins	204	225	243	192	201	195	215	211	229	239	214	-10.5	0.5
Phenolic resins	259	250	262	232	242	261	287	280	284	295	287	-2.7	1.0
Polycarbonate	317	351	354	370	386	409	411	431	413	418	347	-17.0	0.9
Synthetic rubber	1,520	1,577	1,590	1,466	1,522	1,577	1,616	1,627	1,607	1,655	1,651	-0.2	0.8
SOUTH KOREA													
Acrylonitrile-butadiene-styrene	636	784	777	932	1,120	1,143	1,105	980	1,077	1,145	1,056	-7.8%	5.2%
Polyethylene, high-density	1,615	1,756	1,706	1,839	1,871	1,925	1,882	1,949	1,936	1,984	2,031	2.4	2.3
Polyethylene, low-density	1,518	1,642	1,576	1,614	1,624	1,627	1,706	1,744	1,728	1,790	1,783	-0.4	1.6
Polypropylene	2,355	2,440	2,413	2,485	2,622	2,811	2,930	3,013	3,040	3,240	3,391	4.7	3.7
Polystyrene	1,038	1,105	1,212	1,354	1,361	1,427	1,176	1,093	1,009	1,072	1,014	-5.4	-0.2
Polyvinyl chloride	1,013	1,170	1,191	1,238	1,244	1,278	1,306	1,184	1,203	1,161	1,164	0.3	1.4
TAIWAN													
Acrylonitrile-butadiene-styrene	899	1,016	1,067	985	1,078	1,105	1,166	1,215	1,274	1,324	1,130	-14.7%	2.3%
Polyester resin	175	204	198	204	219	212	185	168	162	168	143	-14.9	-2.0
Polyethylene, high-density	273	395	306	510	507	547	537	515	521	577	512	-11.3	6.5
Polyethylene, low-density	224	236	273	477	492	536	609	663	597	700	623	-11.0	10.8
Polypropylene	418	517	564	773	830	937	1,020	1,098	1,174	1,262	1,179	-6.6	10.9
Polystyrene	764	765	711	866	848	858	817	830	713	761	638	-16.2	-1.8
Polyurethane resin	145	157	185	170	189	193	214	195	191	185	169	-8.6	1.5
Styrene-butadiene rubber	107	104	83	81	78	69	108	96	102	112	102	-8.9	-0.5
Polybutadiene rubber	56	54	50	52	52	54	56	53	50	54	50	-7.4	-1.1

SOURCES: Japan's Ministry of Economy, Trade & Industry; Korea National Statistical Office, Republic of Korea; Petrochemical Industry Association of Taiwan; Taiwan's Ministry of Economic Affairs

U.S. SYNTHETIC FIBERS

Output of noncellulosic fibers continued to fall, and cellulosics held steady

THOUSANDS OF METRIC TONS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE 2007-08	ANNUAL CHANGE 1998-08
NONCELLULOSIC FIBERS													
Nylon	1,218	1,217	1,215	1,019	1,112	1,115	1,142	1,082	1,023	937	728	-22.3%	-5.0%
Olefin	1,326	1,395	1,461	1,316	1,397	1,374	1,388	1,403	1,290	1,295	1,109	-14.3	-1.8
Polyester (a)	1,768	1,763	1,795	1,488	1,516	1,427	1,534	1,471	1,411	1,240	1,060	-14.5	-5.0
CELLULOSIC FIBERS													
Acetate (b) & rayon	166	135	158	103	81	75	67	49	27	27	27	0.0%	-16.5%

a Includes polyester carpet yarn from 2000. **b** Includes diacetate and triacetate; excludes production for cigarette filters. **SOURCE:** Fiber Economics Bureau

JAPAN SYNTHETIC FIBERS

Pace of industry's decline accelerated in 2008

THOUSANDS OF METRIC TONS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE 2007-08	ANNUAL CHANGE 1998-08
Man-made (a)	**1,724**	**1,634**	**1,643**	**1,564**	**1,416**	**1,316**	**1,279**	**1,249**	**1,209**	**1,193**	**1,071**	**-10.2%**	**-4.6%**
Polyester (a)	684	665	665	628	564	528	520	496	483	465	435	-6.5	-4.4
Acrylic (b)	418	372	377	365	358	298	267	261	243	236	145	-38.6	-10.0
Polypropylene (a)	109	109	111	117	114	116	120	125	127	127	125	-1.6	1.4
Nylon (c)	180	174	176	162	126	121	121	118	118	117	112	-4.3	-4.6

a Sum of staple and filament. **b** Staple only. **c** Filament only. **SOURCE:** Ministry of Economy, Trade & Industry

U.S. FERTILIZERS

Production of five types of fertilizers fell despite strong demand from agriculture

THOUSANDS OF METRIC TONS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ANNUAL CHANGE 2007-08	ANNUAL CHANGE 1998-08
NITROGEN PRODUCTS													
Ammonia	15,032	14,484	13,438	10,455	11,306	10,475	9,164	8,945	7,209	7,888	8,226	4.3%	-5.9%
Ammonium nitrate	3,183	3,165	2,873	2,192	2,246	2,142	2,165	2,473	2,045	2,180	2,105	-3.4	-4.0
Ammonium sulfate	2,453	2,517	2,595	2,353	2,405	2,595	2,669	2,676	2,706	2,597	2,809	8.2	1.4
Urea	4,850	5,066	4,742	3,678	4,477	4,443	3,095	3,086	2,284	2,603	2,436	-6.4	-6.7
Nitrogen solutions	8,980	10,136	9,038	9,143	7,985	8,863	7,781	8,062	7,022	8,549	8,545	-0.1	-0.5
PHOSPHATE PRODUCTS													
Diammonium phosphate	14,088	14,528	12,670	10,049	10,825	9,991	10,404	9,988	9,474	8,202	8,018	-2.2%	-5.5%
Monoammonium phosphate	3,624	3,511	4,106	4,087	4,175	4,734	5,328	5,213	4,170	4,838	5,004	3.4	3.3
Phosphate rock	37,814	38,352	36,088	34,219	29,183	32,327	35,338	35,183	33,127	29,370	29,673	1.0	-2.4
Phosphoric acid (P_2O_5)	11,264	11,470	10,751	9,406	10,125	10,253	10,530	10,533	9,802	9,379	8,912	-5.0	-2.3

NOTE: Years ending June 30. Figures are based on Fertilizer Institute surveys and may not represent the entire industry. **SOURCE:** Fertilizer Institute

EUROPE FERTILIZERS

Ammonium sulfate and nitric acid saw strong gains in 2007

THOUSANDS OF METRIC TONS	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	ANNUAL CHANGE, 2006-07
Ammonium nitrate	1,171	631	897	721	687	1,505	1,168	6,656	6,138	2,394	2,373	-0.9%
Ammonium sulfate	478	585	566	675	1,442	769	832	1,735	1,703	1,382	1,639	18.6
Anhydrous ammonia	2,291	2,295	2,213	2,078	2,362	9,394	4,752	12,364	13,187	3,907	4,033	3.2
Nitric acid	266	290	264	153	600	612	2,378	6,581	6,326	849	952	12.1
Urea	368	na	600	725	214	947	767	2,407	2,822	2,560	2,351	-8.2

NOTE: Data for 2008 are not available. Data from 2005 forward are for 27 countries in the European Union; between 2002 and 2005, for 25 countries; and prior to 2002, for 15 countries. Thus, 10-year comparisons are not meaningful. **na** = not available. **SOURCES:** European Union, national government statistics offices