

APPENDIX: ENDNOTES

Preface

1. The 2004 and 2006 *Performance Reports* are available on the EPA website, <http://www.epa.gov/sectors/performance>.
2. See the Data Sources, Methodologies, and Considerations chapter for a discussion of normalization and for sources of normalizing data for each sector.
3. For more information on MECS, see the Data Sources, Methodologies, and Considerations chapter and <http://www.eia.doe.gov/emeu/meecs/>.
4. For more information on NEI, see the Data Sources, Methodologies, and Considerations chapter and <http://www.epa.gov/ttn/chief/trends/>.
5. For more information on TRI, see the Data Sources, Methodologies, and Considerations chapter and <http://www.epa.gov/tri>.
6. For more information on RSEI, see the Data Sources, Methodologies, and Considerations chapter and <http://www.epa.gov/oppt/rsei/>.
7. For more information on BR, see the Data Sources, Methodologies, and Considerations chapter and <http://www.epa.gov/epaoswer/hazwaste/data/biennialreport/>.

Executive Summary

1. *Number of Facilities*: Census Bureau, County Business Patterns (CBP), 2004, <http://www.census.gov/epcd/cbp/view/cbpview.html>, except as noted for sectors such as Cement Manufacturing and Iron & Steel (see Data Guide for more information); *Employment*: Census Bureau, CBP, 2004, except as noted for particular sectors (see Data Guide); *Value of Construction put in place*: Census Bureau, Value of Construction Put in Place, <http://www.census.gov/const/C30/totsa.pdf>; *Revenue for Colleges & Universities*: National Center for Education Statistics, "Postsecondary Institutions, Fall 2005; Graduation Rates, 1999 & 2002 Cohorts; and Financial Statistics, Fiscal Year 2005," <http://nces.ed.gov/pubs2007/2007154.pdf>; *Revenue for Ports*: Census Bureau, 1997 and 2002 Economic Census, <http://www.census.gov/econ/census02>, North American Industry Classification System (NAICS) codes 48831 and 48832; *Energy Use*: Department of Energy (DOE), Energy Information Administration (EIA), Manufacturing Energy Consumption Survey (MECS), 2002; *Emissions of Criteria Air Pollutants*: EPA, National Emission Inventory (NEI) for Point Sources: Final v3 2002; *Air emissions; water discharges; land disposals; recycling, energy recovery, and treatment*: EPA, Toxic Release Inventory (TRI), 2005 Public Data Release (PDR), freeze date: December 19, 2006; *Hazardous Waste Generated*: EPA, *National Biennial RCRA Hazardous Waste Report*, 2005, <http://www.epa.gov/epaoswer/hazwaste/data/biennialreport/>; *Global Standing—Food & Beverage Manufacturing Ranking*: Confederation of the food and drink industries of the EU, "Data and Trends of the European Food and Drink Industry," 2006, (citing ABIA; Japanese Ministry of Economy Trade and Industry, Department of Commerce, INEGI, National Bureau of Statistics of China, Canada's business and consumer site, New Zealand's Economic Development Agency, AFFA), page 18, http://www.ciaa.be/documents/brochures/Data_&_Trends_2006_FINAL.pdf; additional information on European Union value of output: E-mail correspondence from E. Dollet, Manager Economic Affairs, Confederation of the Food and Drink Industries of the EU, to D. Kaiser, EPA, May 19, 2008; *Global Standing—Steel*: International Iron and Steel Institute, "World crude steel output increases by 7.5% in 2007," January 23, 2008, <http://www.worldsteel.org/?action=newsdetail&id=228>; *Global Standing—Cement*: Portland Cement Association, "About the Cement Industry," <http://www.cement.org/manufacture/>; *Global Standing—Forest*

Products sector: AF&PA submission to USTR, December 2005, <http://www.afandpa.org/Template.cfm?Section=international2&template=/ContentManagement/ContentDisplay.cfm&ContentID=12382>; *Global Standing—Construction*: "Construction Services Sector, 2007; U.S. Market Overview", International Trade Administration, Department of Commerce, <http://trade.gov/investamerica/construction.asp>; *Global Standing—Chemical Manufacturing*: American Chemistry Council, "essential2economy", http://www.americanchemistry.com/s_acc/sec_topic.asp?CID=5&DID=8; *General Comparisons and Examples of Economic Trends*: see individual sector chapters for examples referenced and data citations.

2. DOE, EIA, Annual Energy Review 2006, Report No. DOE/EIA-0384(2006), <http://www.eia.doe.gov/aer/pdf/perspectives.pdf>.
3. DOE, EIA, World Primary Energy Consumption by Region, 1995–2004, <http://www.eia.doe.gov/emeu/aer/txt/stb1103.xls>.
4. DOE, EIA, Annual Energy Review 2006, Report No. DOE/EIA-0384(2006).
5. See also EPA, *Energy Trends in Selected Manufacturing Sectors: Opportunities and Challenges for Environmentally Preferable Energy Outcomes*, March 2007, <http://www.epa.gov/sectors/pdf/energy/report.pdf>.
6. 2005 total from: *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2005*, April 2007, p. ES-5, <http://www.epa.gov/climatechange/emissions/downloads06/07CR.pdf>; 1996 total from: *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2002*, p. ES-4, <http://www.epa.gov/climatechange/emissions/downloads06/04ES.pdf>.
7. EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2005*, p. ES-15.
8. EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2005*, EPA 430-R-07-002 April 2007, p. 5, <http://www.epa.gov/climatechange/emissions/downloads06/07ES.pdf>.
9. EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2005*; Production data: 2006 Annual Statistical Report, American Iron and Steel Institute, Washington, DC, p. 3; 1996 data from: EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2002*.
10. EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2005*; Production data: U.S. Geological Survey (USGS), Mineral Commodity Summaries.
11. EPA, NEI, Final v3 2002.
12. Total tonnages for CAPs and VOCs (PM without condensibles); EPA, NEI Air Pollutant Emissions Trends Data, 1970–2006 Average annual emissions, all criteria pollutants (July 2007), Excel file, <http://www.epa.gov/ttn/chief/trends/trends06/nationaltier1upto2006basedon2002finalv2.1.xls>.
13. EPA, TRI, 2005 PDR; EPA, *National Biennial RCRA Hazardous Waste Report*, 2005.

Data Guide

1. Information available on the Census webpage, <http://www.census.gov/naics/>.
2. Department of Health and Human Services, Public Health, Agency for Toxic Substances and Disease Registry (ATSDR), Toxicological Profile for Benzene (Draft), Atlanta, GA, 1997.

Cement Manufacturing

1. *Facilities*: Portland Cement Association (PCA), *U.S. and Canadian Portland Cement Industry: Plant Information Summary*, December 31, 2006, Executive Summary, p. 1; *Employment*: PCA, U.S. Labor-Energy Input Survey 2006; *Clinker Production*: USGS Mineral Commodity Summaries, 2007, p. 40-41, <http://minerals.usgs.gov/minerals/pubs/commodity/cement/index.html>.
2. *Energy Use*: PCA, *U.S. and Canadian Labor-Energy Input Survey 2006. TRI releases; Emissions of Criteria Air Pollutants*: EPA, NEI for Point Sources: Final v3 2002; *Releases of Chemicals reported to TRI*: EPA, TRI, 2005 PDR, freeze date: December 19, 2006; *Hazardous Waste Generated and Managed*: EPA, *National Biennial RCRA Hazardous Waste Report*, 2005, <http://www.epa.gov/epaoswer/hazwaste/data/biennialreport>. This sector is defined by a predetermined list of cement manufacturing facilities.
3. USGS, 2005 Minerals Yearbook, February 2007, p. 16.2, <http://minerals.usgs.gov/minerals/pubs/commodity/cement/cemenmyb05.pdf>. The 10 largest companies in 2005 were Holcim (US) Inc.; Lafarge North America, Inc.; CEMEX, Inc.; Buzzi Unicem USA, Inc.; Lehigh Cement Co.; Ash Grove Cement Co.; Essroc Cement Corp.; Texas Industries Inc.; California Portland Cement Co.; and St. Marys Cement, Inc.
4. USGS, Mineral Commodity Summaries—Cement, January 2008, <http://minerals.usgs.gov/minerals/pubs/commodity/cement/mcs-2008-cemen.pdf>.
5. PCA, “Additional Cement Consumption Declines Forecasted” (press release), October 29, 2007, <http://www.cement.org/newsroom/fallforecastWeb102507.asp>. Recent PCA economic projections anticipate reduced cement consumption from a weakened economy (a combination of the subprime mortgage crisis coupled with increased energy costs, leading to a decline in overall nonresidential construction). As a result, PCA predicts that 2007 cement consumption will decline 6.9%, followed by a 2.5% decline in 2008.
6. PCA, *U.S. and Canadian Labor-Energy Input Survey 2006*, December 2006, p. i.
7. PCA, *U.S. and Canadian Labor-Energy Input Survey 2006*, p. 5.
8. PCA, *U.S. and Canadian Labor-Energy Input Survey 2006*, p. i.
9. DOE, *Energy and Emission Reduction Opportunities for the Cement Industry*, December 2003, http://www1.eere.energy.gov/industry/imf/pdfs/eeroci_dec03a.pdf.
10. USGS, 2005 Mineral Yearbook—Cement, p. 16.3.
11. PCA, *U.S. and Canadian Portland Cement Industry: Plant Information Summary*, 2006, p. 3.
12. PCA, 2007 Report on Sustainable Manufacturing, undated, <http://www.cement.org/smreport07/index.htm>.
13. CEMBUREAU website, Key Facts, <http://www.cembureau.be>.
14. Facility count is by TRI ID. Note that a facility can have more than one TRI ID.
15. EPA, TRI, 2005 PDR.
16. EPA, TRI, 2005 PDR, modeled through EPA’s Risk-Screening Environmental Indicators (RSEI).
17. EPA, NEI for Point Sources, Final v3 2002. Data compiled from EPA’s facility summary datasets. Includes facilities from a predetermined list of cement manufacturing facilities.
18. Hendrik G. van Oss, USGS, *Background Facts and Issues Concerning Cement and Cement Data*, p. 34, <http://pubs.usgs.gov/of/2005/1152/2005-1152.pdf>.
19. EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005*, April 2007, p. 4-5, <http://www.epa.gov/climatechange/emissions/usinventoryreport.html>.
20. Holcim Ltd., *Corporate Sustainable Development Report 2005*, p. 24, http://www.holcim.com/gc/CORP/uploads/CSDR_2005_rev.pdf; Lafarge, *Sustainability Report 2006*, p. 56, http://www.lafarge.com/05032007-publication_sustainable_development-report2006-uk.pdf; and St. Lawrence Cement Group, *Building Value Responsibly: Sustainable Development Report*, February 2006, p. 9, http://www.holcim.com/gc/CA/uploads/SLC_SD_Report_February_2006_FINAL.pdf. Amounts are in metric tons. Holcim reported 658 kg/ton; Lafarge reported 670 kg/ton; and St. Lawrence Cement reported 668 kg/ton.
21. PCA, “Cement Industry Honors California Portland Cement Plant for Energy Efficient Operations” (press release), March 19, 2007, http://www.cement.org/newsroom/CalPortland_MojaveCA.asp.
22. Buzzi Unicem, “Chattanooga Plant Honoured for Reducing Emissions” (press release), June 26, 2007, <http://www.buzziunicem.it/online/BuzziUnicem/en/Home/articolo817.html>.
23. PCA, “Cement Formulation Change Promises Improved Emission Performance” (press release), November 13, 2003, <http://www.cement.org/newsroom/greenbuildrelease20031113.asp>.
24. EPA, TRI, 2005 PDR.
25. PCA, *2008 Report on Sustainable Manufacturing*, http://www.cement.org/smreport08/sec_page3_2.htm.
26. EPA, *National Biennial RCRA Hazardous Waste Report*, 2005.
27. EPA, *National Biennial RCRA Hazardous Waste Report*, 2005.
28. EPA, TRI, 2005 PDR.
29. PCA, *2007 Report on Sustainable Manufacturing*, Chapter 1: Cement, Concrete, & Voluntary Goals; Environmental Performance Measures, http://www.cement.org/smreport08/sec_page1_3_C.htm.

Chemical Manufacturing

1. *Facilities*: Census Bureau, County Business Patterns (CBP), 2005, <http://www.census.gov/epcd/cbp/view/cbpview.html>; *Employment*: Census Bureau, CBP, 2005, <http://www.census.gov/epcd/cbp/view/cbpview.html>; *Value of shipments*: Department of Commerce (DOC), Bureau of Economic Analysis (BEA): Industry Economic Accounts, 2005, http://www.bea.gov/industry/xls/GDPbyInd_SHIP_NAICS_1998-2005.xls. Sector defined by NAICS code 325 or SIC code 28 (Specialty-batch facilities defined by NAICS code 271).
2. *Energy Use*: DOE, EIA, Manufacturing Energy Consumption Survey (MECS), 2002 Data Tables, Table 3.1, Energy Consumption as a Fuel, <http://www.eia.doe.gov/emeu/mecs/mecs2002/data02/shelltables.html>; *Criteria Air Pollutants*: EPA, NEI for Point Sources: Final v3 2002. Data compiled from EPA’s facility-summary datasets. Specialty-batch CAPs reported were 118,800 tons; *Releases of Chemicals Reported to TRI*: EPA TRI, 2005 PDR, <http://www.epa.gov/tri/tridata/tri05/index.htm>; *Hazardous Waste Generated and Managed*: EPA, *National Biennial RCRA Hazardous Waste Report*, 2005, <http://www.epa.gov/epaoswer/hazwaste/data/biennialreport/>; Specialty-batch releases of chemicals reported to TRI: air emissions, 9.1 million lbs.; water discharges, 2.7 million lbs; waste disposals, 2.8 million lbs.; recycling, energy recovery, or treatment, 1.2 billion lbs.
3. This sector is defined by SIC 28, and the corresponding NAICS 325. The specialty-batch subsector is characterized by a facility list based on the Synthetic Organic Chemical Manufacturers Association (SOCMA) membership as of February 2007. This list includes 271 facilities.
4. Membership includes 271 facilities as of February 2007. The SOCMA membership list is available at the SOCMA website, <http://www.socma.com/MemberList/>.
5. American Chemical Council (ACC), *Guide to the Business of Chemistry 2006*, p. 103-105.
6. EPA, *Energy Trends in Selected Manufacturing Sectors*, 2007, footnote 21 on p. 2-12, <http://www.epa.gov/sectors/energy/index.html>. The implementation of these opportunities depends on

- market factors, such as the price of natural gas, and there are many technical, regulatory, and supply constraints on fuel switching.
7. EPA, *Energy Trends in Selected Manufacturing Sectors*, 2007. The report cites Interlaboratory Working Group, Oak Ridge National Laboratory and Lawrence Berkeley National Laboratory, *Scenarios for a Clean Energy Future*, 2000, <http://www.ornl.gov/sci/eere/cef/>.
 8. SOCMA, "2006 Performance Improvement Awards Best Practices," <http://www.socma.com/chemStewards/index.cfm?subSec=23&articleID=142>.
 9. DOE, EIA; MECS, 2002 Data Tables, Table 3.1, Energy Consumption as a Fuel (physical units) and Table 11.3, Components of Onsite Generation of Electricity, <http://www.eia.doe.gov/emeu/mecs/mecs2002/data02/shelltables.html>.
 10. ACC, Responsible Care 2006 Energy Efficiency Awards Program, April 19, 2007.
 11. ACC, Responsible Care 2006 Energy Efficiency Awards Program, April 19, 2007.
 12. EPA, TRI, 2005 PDR.
 13. EPA, TRI, 2005 PDR, modeled through EPA's Risk Screening Environmental Indicators (RSEI).
 14. EPA, TRI, 2005 PDR, modeled through EPA's RSEI.
 15. EPA, TRI, 2005 PDR, modeled through EPA's RSEI. Specialty-batch chemicals sector trends are presented in absolute values (rather than values that are normalized for subsector growth) due to the lack of data on the subsector growth or production over the time period presented.
 16. EPA, TRI, 2005 PDR, modeled through EPA's RSEI.
 17. EPA, TRI, 2005 PDR.
 18. EPA, NEI for Point Sources, Final v3 2002.
 19. ACC, Responsible Care 2006 Energy Efficiency Awards Program, April 19, 2007.
 20. EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005*, April 2007, p. 4-1, <http://www.epa.gov/climatechange/emissions/usinventoryreport.html>.
 21. Climate VISION mission statement, <http://www.climatevision.gov/mission.html>.
 22. ACC, *Guide to the Business of Chemistry 2006*, p. 110.
 23. ACC, Performance Through Responsible Care, http://www.americanchemistry.com/s_responsiblecare/doc.asp?CID=1298&DID=5084.
 24. CH₂M HILL, "Water Use in Industries of the Future," prepared for DOE, Office of Energy Efficiency and Renewable Energy, Industrial Technologies Program, July 2003, p. 26.
 25. Byers, W., G. Lindgren, C. Noling, D. Peters. *Industrial Water Management: A Systems Approach*. CH₂M Hill, Inc., New York, 2003.
 26. Byers, W., G. Lindgren, C. Noling, D. Peters. *Industrial Water Management: A Systems Approach*. CH₂M Hill, Inc., New York, 2003.
 27. Personal correspondence, Sarah Mazur, EPA, with David DiMarcello, BASF, October 19, 2007.
 28. EPA, Integrated Data for Enforcement Analysis (IDEA) system extracts of both the Permit Compliance System (PCS) and ICIS-NPDES (October 2007).
 29. 40 CFR §§ 414, 415, 417, 418, 422, 428, 439, 446, 447, 454, 455, 457, 458, and 463[0].
 30. EPA, TRI, 2005 PDR.
 31. Personal correspondence, Richard Lee, Environmental Specialist, Arizona Chemical, Port St. Joe Plant, with Warren Hixenbaugh, ICF International, August 27, 2007.
 32. CH₂M HILL, "Water Use in Industries of the Future," prepared for DOE, p. 26-33.
 33. EPA, RCRA Hazardous Waste Report.
 34. EPA, TRI, 2005 PDR.
 35. EPA, TRI, 2005 PDR.
 36. EPA, TRI, 2005 PDR.
 37. ACC, *Responsible Care 2006 Energy Efficiency Awards Program*, April 19, 2007.
 38. SOCMA, "2006 Performance Improvement Awards Best Practices," <http://www.socma.com/chemStewards/index.cfm?subSec=23&articleID=142>.
 39. SOCMA, ChemStewards® program, <http://www.socma.com/chemstewards/index.cfm?subSec+16>.
 40. American Chemistry Council, Responsible Care, http://www.americanchemistry.com/s_responsiblecare/sec.asp?CID=1298&DID=4841.

Colleges & Universities

1. *Facilities*: Census Bureau, CBP, 2004; <http://www.census.gov/epcd/cbp/view/cbpview.html>; *Employees*: Census Bureau, CBP, 2004; <http://www.census.gov/epcd/cbp/view/cbpview.html>; *Revenue*: National Center for Education Statistics, "Postsecondary Institutions, Fall 2005; Graduation Rates, 1999 & 2002 Cohorts; and Financial Statistics, Fiscal Year 2005," <http://nces.ed.gov/pubs2007/2007154.pdf>. County Business Patterns shifted from the use of SIC to NAICS codes in 1998, potentially causing the apparent dip shown in facilities at that time.
2. *Criteria Air Pollutants*: EPA, NEI for Point Sources: Final V2 2002. Data compiled from EPA's facility-summary datasets. Includes facilities with NAICS code 61131 or SIC code 8221. (The sector definition differs from the 2006 Performance Report in that it excludes junior colleges.) *Hazardous Waste Generated and Managed*: EPA, *National Biennial RCRA Hazardous Waste Report*, 2005, <http://www.epa.gov/epaoswer/hazwaste/data/biennialreport/>.
3. Blaine Collison, EPA Green Power Partnership, personal communication with Sector Strategies Division staff, Sept. 20, 2007.
4. For further information, visit http://www.epa.gov/chp/public-recognition/current_winners.html.
5. EPA NEI for Point Sources: Final v3 2002. Data were compiled from EPA's facility-summary datasets. Includes facilities with NAICS code 61131 or SIC code 8221. (The sector definition differs from the 2006 Performance Report in that it excludes junior colleges.)
6. Tom Frankiewicz, Program Manager, EPA Combined Heat and Power Partnership, personal communication with Sector Strategies Division staff, October 4, 2007.
7. EPA, Office of Water, Industrial Water Pollution Controls, "Effluent Guidelines," May 8, 2007, <http://www.epa.gov/guide/>; and EPA, "Technical Support Document for the 2006 Effluent Guidelines Program Plan," Dec 2006, p. 19-14, <http://www.epa.gov/waterscience/guide/304m/2006-TSD-whole.pdf>.
8. EPA, Office of Water, Wastewater Management, "Sectors of Industrial Activity that Require Permit Coverage," <http://cfpub.epa.gov/npdes/stormwater/swcats.cfm>; and EPA, Office of Water, Wastewater Management, "Factsheet: Proposed MSGP 2006," p. 6, http://www.epa.gov/npdes/pubs/msgp2006_factsheet-proposed.pdf.
9. "Adam Joseph Center for Environmental Studies" website, <http://www.oberlin.edu/ajlc/ajlcHome.html>.
10. Currently, colleges and universities do not report data to TRI.
11. Recyclemania "General Overview" webpage, <http://www.recyclemaniacs.org/overview.htm>; see also National Recycling Coalition RecycleMania 2007 news release, April 19, 2007.

12. Charles Heizenroth, EPA, personal communication with Sector Strategies Division staff, Sept. 5, 2007.
13. WasteWise is a free, voluntary, EPA program through which organizations eliminate costly municipal solid waste and select industrial wastes, benefiting their budget and the environment. Partners design their own waste reduction programs tailored to their needs. Colleges and universities can save money through reduced purchasing and waste disposal costs. WasteWise provides free technical assistance to help develop, implement, and measure waste reduction activities. In addition to standard WasteWise Benefits, there are many college and university-specific resources to help reduce the amount of waste produced and disposed of. Some of these benefits include assistance with waste reduction efforts, eligibility for the WasteWise College and University Award, access to standardized goals and objectives for colleges and universities, and coordinated enrollment process with RecycleMania. For more information, visit EPA's website for WasteWise, <http://www.epa.gov/wastewise/targeted/colleges/benefits.htm>.
14. Charles Heizenroth, EPA, personal communication with Sector Strategies Division staff, Sept. 5, 2007.
15. EPA, *National Biennial RCRA Hazardous Waste Report*, 2005.
16. Sustainable Endowments Institute, College Sustainability Report Card 2008, <http://www.endowmentinstitute.org/>.

Construction

1. *Facilities*: Census Bureau, 2005, <http://censtats.census.gov/cgi-bin/cbnpnaic/cbpsel.pl>; *Employment*: Census Bureau; verified for 2005, <http://censtats.census.gov/cgi-bin/cbnpnaic/cbpsel.pl>; *Value of Construction*: Census Bureau, Construction spending, <http://www.census.gov/const/www/c30index.html>, and Value of Construction put in place, <http://www.census.gov/const/C30/totsa.pdf>.
2. *Energy Use*: EPA, Sector Strategies Division estimate of energy consumption was estimated based on reported dollars spent on distillate fuel, natural gas, and gasoline for construction activities, provided by the Census Bureau's *Industry Series Report for Construction*; and Census Bureau, 1997 Economic Census Industry Series Reports Construction, Jan. 2000, <http://www.census.gov/prod/ec97/97c23-is.pdf>; *Construction & Demolition Debris*: Franklin Associates, for EPA, *Characterization of Building-Related Construction and Demolition Debris in the United States and Characterization of Road and Bridge Related Construction and Demolition Debris in the United States*, 2005, representing disposals in 2003 (preliminary estimate).
3. McGraw-Hill Construction data (value of construction, number of projects) were used to normalize several performance measures in this chapter (in addition to Census data). The McGraw-Hill data are more comprehensive than Census Bureau data, and they are updated quarterly, available through 2006, and available by state. A construction "establishment" is generally the fixed place of business where construction activities are managed. Establishments are not construction projects, <http://www.census.gov/econ/census02/naics/sector23/23.htm>.
4. Census Bureau, Construction Spending (Value Put in Place), <http://www.census.gov/const/www/totpage.html>.
5. Associated General Contractors of America (AGC), *Construction Economics*, http://www.agc.org/cs/industry_topics/construction_economics, (see also Recommendations for Reducing Emissions from the Legacy Diesel Fleet, p. E-vii October 7, 2005, <http://www.epa.gov/cleandiesel/documents/caaac-apr06.pdf>) (showing figure of 92%).
6. EPA, *Measuring Construction Industry Environmental Performance*, September 2007, p. 35, <http://www.epa.gov/ispd/construction/perfmeasures.pdf>.
7. ICF Consulting, *Emission Reduction Incentives for Off-Road Diesel Equipment Used in the Port and Construction Sectors*, 2005, available at http://www.epa.gov/sustainableindustry/pdf/emission_20050519.pdf, p. 1.
8. EPA, Sector Strategies Division estimate of energy consumption was estimated based on reported dollars spent on distillate fuel, natural gas, and gasoline for construction activities, provided by the Census Bureau's *Industry Series Report for Construction*; and Census Bureau, 1997 Economic Census Industry Series Reports Construction, Jan. 2000, <http://www.census.gov/prod/ec97/97c23-is.pdf>.
9. EPA, *Cleaner Diesels: Low Cost Ways to Reduce Emissions from Construction Equipment*, March 2007.
10. Census Bureau, Annual Value of Construction Put in Place, <http://www.census.gov/const/C30/total.pdf>.
11. Truitt Degeare, EPA, Office of Solid Waste, communication with Peter Truitt, EPA.
12. The NCDRC compiles information on emissions reductions associated with voluntary diesel retrofits. Went, J., EPA Office of Transportation and Air Quality, communication Peter Truitt, EPA, August 2007. Fewer retrofit technologies are available for NO_x than for PM_{2.5}, but the tonnage reduced is greater because NO_x emissions are heavier than PM_{2.5} emissions. The NCDRC database includes 85 projects, but emissions data are available for only 40 of them.
13. Associated General Contractors Survey, as reported in 2008 *Associated Equipment Manufacturers Outlook*, p. 11, November 2007, http://www.aem.org/Trends/Reports/IndustriesOutlook/PDF/2008-Industries_Outlook.pdf. In sum, 17,596 AGC general contractor and specialty contractor member companies were surveyed by email.
14. EPA, *Measuring Construction Industry Environmental Performance*, September 2007, p. 35, <http://www.epa.gov/ispd/construction/perfmeasures.pdf>.
15. Science Applications International Corporation, prepared for EPA, *Economic Analysis of the Final Phase II Storm Water Rule*, October 1999, p. 2-2: "When land is disturbed by construction activities, surface erosion increases 10-fold on sites formerly used for crop agriculture, 200 times on sites formerly under pasture, and 2,000 times on sites formerly forested."
16. EPA and authorized states establish general National Pollutant Discharge Elimination System (NPDES) permits that codify specific site management practices and reporting requirements. Further information is available at the EPA website <http://cfpub.epa.gov/npdes>. Additional information on construction stormwater is available at the Construction Industry Compliance Assistance Center website, <http://www.cicacenter.org>.
17. Data in the figure were adjusted to account for multiple NOI submissions for the same construction project and for projects not requiring an NOI because of acreage thresholds or waivers. However, the denominator (number of projects) overestimates the number of projects requiring an NOI because (1) a single construction site may be counted multiple times if it happens to include multiple project types, and (2) the number of projects includes renovations and additions, which may not require an NOI.
18. Colorado Department of Public Health, *Colorado Stormwater Excellence Program—Pilot Stage 1—Final Report*, <http://www.cdphe.state.co.us/wq/PermitsUnit/stormwater/CSEStage1.pdf>.
19. Currently, there is no centralized source of data on quantities of C&D materials generated or recycled. Source of estimates: EPA's Municipal and Industrial Solid Waste Division, Office of Solid Waste, *Characterization of Building-Related Construction and Demolition Debris Materials in the United States (DRAFT)*, July 2006. Considerable uncertainties are associated with these estimates; EPA is seeking to develop a methodology for more accurate measurement.
20. Kim Cochran, EPA Office of Solid Waste, communication with Peter Truitt, EPA.

21. EPA's Office of Solid Waste. *Characterization of Road and Bridge Related Construction and Demolition Debris Materials in the United States (DRAFT)*, October 2005.
22. Turner Construction Company, Green Buildings website, <http://www.turnerconstruction.com/greenbuildings/content.asp?d=2199>.
23. These examples are state-specific, and further research must address the variation among the states and the reasons for short-term anomalies, such as the sudden drop in recycling in Maryland in 2003. Additional information on C&D recycling is available on EPA's website, <http://www.epa.gov/epaoswer/non-hw/debris-new/index.htm>.
24. *Recycling Construction Materials—An Important Part of the Construction Process*, by Kimberly Cochran and Nicole Villamizar, in *Construction Business Owner* magazine, July 2007, <http://www.constructionbusinessowner.com/topics/environment-and-compliance/recycling-construction-materials-an-important-part-of-the-construction-process.html>.
25. *Recycling Construction Materials—An Important Part of the Construction Process*, by Kimberly Cochran and Nicole Villamizar, in *Construction Business Owner* magazine, July 2007, <http://www.constructionbusinessowner.com/topics/environment-and-compliance/recycling-construction-materials-an-important-part-of-the-construction-process.html>.
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27. EPA, *National Biennial RCRA Hazardous Waste Report*, 2005, <http://www.epa.gov/epaoswer/hazwaste/data/biennialreport/>.
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Food & Beverage Manufacturing

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14. EPA, TRI, 2005 PDR, modeled through EPA's RSEI.
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Iron & Steel

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- [minerals/pubs/commodity/iron_&_steel/festemcs07.pdf](#); see 2006 report for comparable narrative and sources.
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 19. EPA, "Profile of the Iron and Steel Industry," September 1995, <http://www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/iron&stl.pdf>. See also AISI, *The Steel Industry Technology Roadmap for Automotive*, <http://www.steel.org/AM/Template.cfm?Section=PDFs&CONTENTFILEID=937&TEMPLATE=/CM/ContentDisplay.cfm>.
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 26. EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005*, p. 4-7.
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Metal Casting

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2. *Energy Use*: DOE, EIA, *Manufacturing Energy Consumption Survey (MECS), 2002*; *Emissions of Criteria Air Pollutants*: EPA, *National Emission Inventory (NEI) for Point Sources: Final v3 2002*. *Chemicals Reported to TRI*: EPA, TRI, 2005 Public Data Release (PDR), freeze date: December 19, 2006; *Hazardous Waste Generated and Managed*: EPA, *National Biennial RCRA Hazardous Waste Report*, 2005, <http://www.epa.gov/epaoswer/hazwaste/data/biennialreport>.
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Oil & Gas

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Data Sources, Methodologies, and Considerations



