

# Index

- ABC. See Advanced Battery Consortium  
Accelerated depreciation, 50,209-210  
Advanced Battery Consortium, 298  
Advanced Research Projects Agency, 297  
Advanced Technology Program, 296  
Advanced water and wastewater systems, 137-138  
AFBC. See Atmospheric fluidized bed combustion  
Agency of Industrial Science and Technology, 313-314  
Agency of Natural Resources and Energy, 310,313-314  
Aggressive policy strategy, 28,41-42  
Aid, Trade and Competitiveness Act of 1992,28,42  
Air emissions, 273-274, 275, 281-282  
Air pollution control  
    mobile source, 133-135  
    national differences in standards, 226-227  
    stationary source, 130-133  
    U.S. production and export of equipment, 120  
AIST. See Agency of Industrial Science and Technology  
American Institute of Chemical Engineers, 53, 300  
American Water Works Association, 299  
Amoco Yorktown study, 55,267,273  
ANRE. See Agency of Natural Resources and Energy  
AQMD. See South Coast Air Quality Management District  
ARPA. See Advanced Research Projects Agency  
ASEA Brown Boveri, 10  
ASEAN. See Association of South East Asian Nations  
Asian countries. See *also individual countries*  
    as environmental technology markets, 11, 90, 110-115  
Association of South East Asian Nations, 113-114  
Atmospheric fluidized bed combustion, 144-145  
ATP. See Advanced Technology Program  
Automotive manufacturers, 134, 195,238,298-299  
    pollution control and competitiveness, 204-205  
AWWA. See American Water Works Association  
  
Bank lending, 261  
BAT. See Best available technology  
BEA. See Bureau of Economic Affairs  
Benzene emissions, 273  
Best available technology, 33,57  
    effect on innovation, 123  
BFI. See Browning Ferris Industries  
Blackstone Project, 271  
BMFT. See Ministry for Research and Technology  
BOTB. See British Overseas Trade Board  
British Overseas Trade Board, 166-167  
Browning Ferris Industries, 138-139  
Bubble policy, 279-280  
Bureau of Economic Affairs, 186-187, 188-189  
Bureau of Mines, 301,307  
Business education programs, 52-54  
  
CAA. See Clean Air Act  
CAAA. See Clean Air Act Amendments  
California  
    effects of environmental regulation on Los Angeles economy, 218-219  
    International Energy Fund, 181  
    vehicle emissions regulations, 100, 134

- CAMP. See Cleveland Advanced Manufacturing Program
- Canada, environmental market, 101
- Catalytic converters, 133-135
- CCTP.** See Clean Coal Technology Program
- CEM. See Continuous Emission Monitoring
- Census Bureau, 69, 196-197  
     environmental compliance costs, 188-189  
     survey data, 38
- Center for Applied Technology, 22
- Center for Clean Industrial and Treatment Technologies, 306-307
- Center for Industrial Services, 22,253
- Center for Waste Reduction Technologies, 53,251,300
- Central Europe, environmental market, 105-108
- Centro Ceramico,** 22,256-257
- CERCLA. See Comprehensive Environmental Response, Compensation, and Liability Act
- CFCs.** See **Chlorofluorocarbons**
- Chemical industry  
     pollution prevention practices, 231  
     process modification, 240-241
- Chemical Manufacturers Association, 93,260
- China, environmental market, 112-113
- Chlorofluorocarbons,** 75-76,96
- CIS. See Center for Industrial Services
- Clean **Air** Act, 33,57, 133
- Clean Air Act Amendments, 100,130,131,274,286,288
- Clean coal technologies, 169-170
- Clean Coal Technology Program, 131, 144,302
- Clean Water Act, 33,57, 100,288
- Cleaner energy technologies  
     **coal** combustion and conversion technologies, 144-145  
     end-use energy efficiency, 148  
     gas turbines, 143-144  
     overview, 142-143  
     renewable energy sources, 146-148  
     research and development, 300-305,311-312,316, 317
- Cleaner production technologies. See *also* pollution prevention  
     competitiveness, 149  
     and engineering services, 13  
     estimates of market size, 8-9  
     findings, 4  
     leadership, 9-10  
     and manufacturing, 229
- Cleveland Advanced Manufacturing Program, 253
- Cluster team concept, 33,269
- CMA.** See Chemical Manufacturers Association
- Coal combustion technologies, 144-145
- COEECT.** See Committee on Energy Efficiency Commerce and Trade
- Combustion turbines, 143-144
- Committee on Energy Efficiency Commerce and Trade, 155
- Committee on Renewable Energy Commerce and Trade, 36,63, 155
- The Competitive Advantage of Nations,* 83-84
- Competitiveness  
     conclusions, 149-150  
     and the environment, 81-83  
     and environmental design, 75-76  
     environmental industry, 12-16, 117  
     environmental trade, 117-121  
     factors affecting, 121-128  
     findings, 4-5  
     impact of environmental regulation, 83-87,214-221  
     manufacturing industry, 18-25, 183  
     objectives, 13-14,40
- Compliance costs. See *also* Pollution abatement and control  
     comparing U.S. to other countries, 5, 197-207  
     determining factors, 185-186  
     differing measures, 188-189  
     estimates for U. S., 14-15, 19  
     manufacturing industries, 85  
     overview, 185-186  
     use of economic incentives, 6
- Comprehensive Environmental Response, Compensation, and Liability Act, 140, 261. See *also* Superfund Act
- Construction services, 128-130
- Contaminated site remediation, 140-142,300
- Continuous Emission Monitoring, 275
- Cooperative Research and Development Agreements, 41,296-297
- CORECT.** See Committee on Renewable Energy Commerce and Trade
- CRADAs.** See Cooperative Research and Development Agreements
- Customer Technology Applications Center, 259
- CWA. See Clean Water Act
- Data needs, 38, 68-69,93, 117
- Defense Environmental Restoration Program, 305

- Delisting, 123
- Demand side management, 124
- Dematerialization, 97
- Denmark, technical assistance program, 22
- DEP. See Department of Environmental Protection
- Department of Commerce, 161-164, 296
- Department of Defense, 44, 101, 141, 258
  - environmental technology research and development, 301, 305-306
- Department of Energy, 44, 48, 101, 141
  - environmental technology research and development, 300-305
  - Office of Industrial Technology, 29, 303-305
- Department of Environmental Protection, 271
- Deposit-refund approaches, 278-279
- DERP. See Defense Environmental Restoration Program
- Design services, 128-130
- Developing countries. See *also* individual countries
  - bilateral aid, 61-62
  - environmental market, 115-116
  - export promotion options, 35-36
  - multilateral cooperation for technical assistance, 60-61
  - pollution abatement and control costs, 20, 203, 205, 207, 210-211
  - technical assistance options, 34-35
- Development assistance programs
  - feasibility studies, 174-176
  - multilateral cooperation options, 34-35
  - promoting exports, 173-174
  - technology cooperation, 176-177
- DOC. See Department of Commerce
- DOD. See Department of Defense
- DOE. See Department of Energy
- Dow Chemical, 234
- DSM. See Demand side management
- Dutch Sustainable Technology Development Program, 292
  
- East Asian countries, See *also* individual countries
  - environmental market, 113-114
- Eastern Europe, environmental market, 105-108
- Eastern Germany, environmental needs, 104
- EBC. See Environmental Business Council of the United States
- EC. See European Commission
- ECD. See Energy Conversion Devices
  
- Ecological and Toxicological Association of the Dye-stuffs Manufacturing Industry, 260
- Economic activities, classifying, 75-79
- Economic incentives. See *also* Environmental regulations; Regulatory reform
  - advantages, 283-286
  - disadvantages, 284, 286-287
  - impact on competitiveness, 124-125
  - incentive-based regulations, 277-278
  - lowering compliance costs, 6
  - past experience, 279-283
  - policy option, 30, 49-50, 54
  - principal findings, 264-265
  - reasons for limited use, 288-289
  - types of incentive systems, 278-279
- Economic policies
  - overview of issues, **39-40**
  - proposals for U.S. programs, 3
- ECOTEC, 94
- ECRE. See Export Council for Renewable Energy
- EGS. See Environmental goods and services industry
- Egypt, environmental market, 115
- Electric Power and Research Institute, 299
- Electric utilities, 258-259
- Electronic Bulletin Board, 165
- Employment
  - effects of environmental regulations, 87
  - export related, 120-121
  - findings, 4
- End-of-pipe pollution control, 80-81, 244
  - compared with prevention and recycling, 229
  - finding alternatives to, 246-247
- Energy Conversion Devices, 146
- Energy Efficiency program, 302-303
- Energy Policy Act of 1992, 42, 46, 62, 304
- Energy service companies, 107
- Energy use efficiency, 148-149
  - markets for, 98-99
- Engineering education programs, 52-54
- Engineering Research Centers, 307
- Environment Agency, 314
- Environmental Action Program, 142
- Environmental activity classification, 75-79
- Environmental and Energy Efficient Technology Transfer Clearinghouse, 172
- Environmental Business Council of the United States, 159
- Environmental Business International, 98-99

- Environmental compliance costs. See Compliance costs
- Environmental Export Assistance Officer, 172
- Environmental exports. See **also** *Export* promotion programs
- awareness and support, 126
  - estimates of, 118-120
- Environmental goods and services industry. See **also** *Export* promotion programs
- classifying environmental activities, 75-79
  - cleaner energy technologies, 142-143
    - val combustion and conversion technologies, 144-145
  - contaminated site **remediation**, 140-142
  - defining the industry, 2,75-82,93-97
  - design and construction services, 128-130
  - employment effects, 87
  - end-use energy efficiency, 148-149
  - environmental trade competitiveness, 117-121
  - factors affecting competitiveness, 12-14, 121-128
  - findings, 4-5
  - framework of industry, 79-82
  - gas turbine technologies, 143-144
  - global markets, 97-116
  - invisible EGS, 8
  - market categories, 90-91
  - market drivers, 91-93
  - mobile source **air** pollution control, 133-135
  - renewable energy, 146-148
  - revenue estimate for U. S., 14-15
  - size of market, 8-12, 89, 97-99. See **also** individual countries and regions
  - stationary source air pollution control, 130-133
  - summary of trends and characteristics, 116
  - U.S. competitiveness, 12-17
  - waste industry, 138-140
  - water and wastewater treatment technologies, 135-138
- Environmental impact costs. See Compliance costs
- Environmental industry. See Environmental goods and services industry
- Environmental issues
- classifying environmental activities, 75-79
  - concerns, 71-72
- Environmental Protection Agency, 52, 81, 119,257
- bubble policy, 279-280
  - diffusion of best practices and technologies, 31
  - Environmental Technology Initiative, 295
  - integrated permits, 270-272
  - integrated regulation, 268-269
  - market-based environmental incentives, 279
  - pollution abatement and control costs, 186-187, 188-189
  - regulatory reform, 32-34
  - research and development, 301, 306-307
  - technical assistance programs, 252
  - trading and banking system, 280,283
- Environmental regulations. See **also** *Economic incentives*; *Pollution abatement and control*
- advances in pollution prevention, 21, 23
  - and competitiveness, 5-6, 83-87, 122-124, 183
  - compliance costs for U.S. industry, 19, 186-207
  - economic costs and benefits, 18, 83-87
  - and employment, 87
  - enforcement of regulations, 211
  - and environmental markets, 92-93, 122-124
  - environmental standards among countries, 210-211
  - features of current regulatory system, 23-24
  - foreign environmental requirements, 19-21, 197-214
  - future directions for other countries, 214
  - government assistance for compliance, 20,207-210
  - and gross domestic product, 321-323
  - incentive-based, 277-289
  - and industrial location, 220-221
  - information disclosure among countries, 213-214
  - innovative approaches, 25
  - linkage between regulatory reform and economic incentives, 265
  - the Michael Porter hypothesis, 83-84
  - new forms, 2-3
  - and productivity, 323-325
  - regulatory reform, 264, 265-277
  - regulatory styles among countries, 211-213
  - and social welfare, 321-323
  - technical assistance for pollution prevention, **22**
  - and technological innovations, 123, 214-216
  - and trade, 216-220
- Environmental research and development. See *Research and development*
- Environmental Restoration and Waste Management Technology Development Program, 300
- Environmental Services Program, 22,253
- Environmental taxes. See *Taxes and fees*
- Environmental technologies. See **also** *Specific technologies*, *Research and development*,

- appropriate technologies, products and service, 126-127
- competitive position of U.S. firms, 4-5
- databases for potential customers, 172
- overall findings, 1-4
- policy issues and options, 26-34,42-58
- promotion of techniques and standards, 125-126
- research, development and demonstration, 127-128
- verification and demonstration, 173
- Environmental Technology Export Council, 159
- Environmental Technology Initiative, 46,295
- Environmental trade, competitiveness, 117-121
- Environmental Trade Working Group, 158-159
- Environmental trends, 72-75
- Environmentally Benign Chemical Synthesis and Processing, 307
- EOP. See End-of-pipe pollution control
- EPA. See Environmental Protection Agency
- EPACT. See Energy Policy Act of 1992
- EPRI. See Electric Power and Research Institute
- ERCs. See Engineering Research Centers
- ESCOs. See Energy service companies
- ESP. See Environmental Services Program
- ETEC. See Environmental Technology Export Council
- Eureka, 316-317
- European Community
  - Directorate-General XII, 16
  - environmental technology research and development, 314-317
- European countries. See *also individual countries*
  - environmental market, 101-108
  - pollution abatement and control costs, 202-203,207
- Eximbank. See Export-Import Bank
- Export Council for Renewable Energy, 155
- Export Enhancement Act of 1992,62, 157, 172, 180
- Export-Import Bank, 37,63, 178-181
- Export promotion programs. See *also* Environmental exports
  - areas of government policy, 153-154
  - assistance for planning and marketing, 160-173
  - bilateral assistance, 61-62
  - developing U.S. strategy, 154-159
  - exports as percentage of gross domestic product, 152
  - financing, 177-181
  - multilateral technical assistance, 60-61
  - overview, 58-60, 151-154
  - policy and strategy, 62-65
  - summary of issues and options, 35-37, 58-64
  - technology verification and demonstration, 173
  - U.S. programs in international context, 159-160
  - use of foreign aid, 173-177
- Extension programs, 255-256
- External recycling, 242-244
- Facility bubbles, 273-274
- Facility-wide Inspections to Reduce Sources of Toxics Initiative, 271
- Farkas Berkowitz & Co., 94-95
- FBC. See Fluidized bed combustion
- FCCSET. See Federal Coordinating Council on Science, Engineering, and Technology
- Feasibility studies, development assistance, 174-176
- Federal Coordinating Council on Science, Engineering, and Technology, 46, 295
- Federal policies. See *also* Environmental regulations
  - data and information needs, 38,68-69
  - development assistance, 34-36,58-60,61-62
  - diffusion of best practices, 30-32,49-54
  - effect on industries, 3
  - export promotion, 35-37, 58-60, 61-65
  - international trade and environment issues, 37-38, 65-68
  - options summary, 27
  - overview of options, 6-7
  - regulatory reform, 32-34, 54-58
  - research and development, 26, 28-30, 42-49
  - strategies, 28, 41-42
  - technical assistance, 34-35, 58-61
  - trade and environment, 37-38, 65-68
- Fees. See Taxes and fees
- FGD. See Flue gas desulfurization
- Financial Assistance, 207-210,261-262
- FIRST. See Facility-wide Inspections to Reduce Sources of Toxics Initiative
- Flue gas desulfurization, 130-131, 132
- Fluidized bed combustion, 144
- Foreign commercial service, 64
  - staffing, 171
- Foreign Commercial Service Officer, 172
- Forest products industry, 95
- Former Soviet Union, environmental market, 105-108
- Fossil fuels program, 302
- Framework programs, 315-316

- France, pollution control costs, 203  
Furniture industry, 218-219
- Gas Research Institute, 299  
Gas turbine technologies, 143-144  
**GATT**. See General Agreement on Tariffs and Trade  
GDP. See Gross domestic product  
General Agreement on Tariffs and Trade, 65  
General Electric, 143-144  
Germany, see also Western Europe  
  amount of exported environmental products, 12  
  development of cleaner production technologies, 9-10  
  environmental needs in eastern Germany, 104  
  environmental technology research and development, 317-318  
  Ministry for Research and Technology, 16, 317  
  pollution abatement and control costs, 199, 202, 206, 209  
GLMTC. See Great Lakes Manufacturing Technology Center  
Global environmental market, See Environmental goods and services industry  
Global environmental trends, 72-75  
Good housekeeping practices, 238  
Government policies. See Federal policies  
Government procurement, 50, 258  
Great Lakes Manufacturing Technology Center, 22, 253  
Green Aid Plan, 132  
GRI. See Gas Research Institute  
Gross domestic product, and environmental regulations, 321-323
- Harmonized Code, 93  
Hazardous Organic NESHAP, 274  
Hazardous Substance Research Centers, 306  
Hazardous Substance Response Fund, 140. See *also* Superfund Act  
Hazardous waste  
  designation, 276  
  industry, 138-140  
  national differences in standards, 227-228  
HC. See Harmonized Code  
Hoechst Celanese, 231, 234  
HON. See Hazardous Organic NESHAP  
House Energy and Commerce Committee, 7  
House Foreign Affairs Committee, 7
- I/U Centers. See **Industry/University** Cooperative Research Centers  
ICETT. See International Center for Environmental Technology Transfer  
IDBs. See Industrial Development Revenue Bonds  
IGCC. See Integrated Gasification Combined Cycle  
Illinois Hazardous Waste Research and Information Center, 81  
IMP. See Industrial Modernization Incentives Program  
Incentive systems. See Economic incentives  
Income growth, 72-73  
Incremental policy strategy, 41  
India, environmental market, 112-113  
Industrial Development Revenue Bonds, 208  
Industrial location, and environmental regulation, 216-221  
Industrial Modernization Incentives Program, 305  
Industrial consortia, 29-30, 4749, 297-300  
Industrial trade associations, 260  
Industry Subsector Analyses, 165  
Industry/University Cooperative Research Centers, 307  
Innovative Technology Council, 306  
Institute for Environmental Cooperation, 58  
Integrated Environmental Management Program, 268-269  
Integrated Gasification Combined Cycle, 145, 316  
Integrated inspections, 271  
Integrated permits, 270-272  
International Center for Environmental Technology Transfer, 177  
International trade issues, 37-38, 65-68  
ISAs. See Industry Subsector Analyses  
Italy  
  Centro Ceramico, 22, 256-257
- Japan  
  amount of exported environmental products, 12  
  cleaner production technologies, 9  
  environmental equipment production and export, 119  
  environmental market, 105  
  environmental requirements, 19-20, 226-228  
  environmental training program, 177  
  financial assistance, 207-209  
  pollution abatement and control costs, 200-205  
  research and development, 292, 310-314

- Japan External Trade Organization, 168, 170-171  
 Japan Society of Industrial Machinery Manufacturers, 68  
 Japanese International Cooperation Agency, 175, 177  
 JETRO. See Japan External Trade Organization  
 JICA. See Japanese International Cooperation Agency  
 JIT. See Just-in-time delivery  
 Just-in-time delivery, 236
- LAER. See Lowest achievable emission rate  
 Latin America  
   environmental market, 11, 108-110  
   as environmental technology market, 11  
 LDAR. See Leak Detection and Repair programs  
 Leak Detection and Repair programs, 240  
 Lowest achievable emission rate, 204  
 LUZ International, 147
- MACT. See Maximum Achievable Control Technology  
 Mae Moh power project, 169-170  
 Management Institute for Environment and Business, 54  
 MANTECH. See Manufacturing Technology Program  
 Manufacturers of Emission Controls Association, 133  
 Manufacturing industries  
   economic factors, 85  
   environment and competitiveness, 81-87  
   environmental design and competitiveness, 75-76  
   impact of environmental regulation, 18-25  
   link with environmental technology firms, 2-3  
   national differences in pollution control standards, 226-228  
   pollution abatement expenditures, 187, 190-194  
 Manufacturing Technology Centers, 307  
 Manufacturing Technology Program, 305  
 Market research assistance, 165-167  
 Marketable permits, 25, 265, 278  
 Massachusetts  
   Center for Applied Technology, 22  
   integrated inspections, 271  
 Massachusetts Institute of Technology, 58  
 Matchmaker Delegations, 167  
 Maximum Achievable Control Technology, 269,274  
 Metal Casting Competitiveness Research Program, 304  
 Metal finishing industry  
   costs of pollution prevention, 235  
   external recycling, 243  
   pollution prevention practices, 231-232  
 Metal Initiative, 304  
 Mexico  
   environmental market, 108-110  
   relocation of furniture manufacturing, 218-219  
 Ministry for International Trade and Industry, 16, 132  
   environmental technology research and development, 310-311  
 Ministry for Research and Technology, 16,317  
 Minnesota Pollution Control Agency, 275  
 MITE. See Municipal Innovative Technology Evaluation  
 MITI. See Ministry for International Trade and Industry  
 Mobile source air pollution, 133-135  
 Monsanto, 234  
 MPCA. See Minnesota Pollution Control Agency  
 MTCS. See Manufacturing Technology Centers  
 Multilateral aid, 60-61  
 Multimedia approach, 268-272  
 Municipal Innovative Technology Evaluation, 52,306
- NAFTA. See North American Free Trade Agreement  
 NASDA. See National Association of State Development Agencies  
 National Association of Metal Finishers, 260  
 National Association of State Development Agencies, 154  
 National Center for Manufacturing Sciences, 297-298  
 National Defense Authorization Act, 305  
 National Defense Center for Environmental Excellence, 305-306  
 National Emission Standards for Hazardous Air Pollutants, 273  
 National Environmental Policy Plan, 318-319  
 National Environmental Technology Act of 1993, proposed, 45-46,52  
 National Environmental Technology Applications Corp., 52,307  
 National Industrial Competitiveness Through Efficiency: Energy, Environment and Economics program, 304  
 National Institute for Resources and Environment, 313  
 National Institute of Standards and Technology, 51, 253,296  
 National Oceanographic and Atmospheric Administration, 295

- National Renewable Energy Research Laboratory, 302
- National Science Foundation, 32,48,53  
     environmental technology research and development, 307
- National Trade Data Bank, 165
- NCMS. See National Center for Manufacturing Sciences
- NDCEE. See National Defense Center for Environmental Excellence
- Near East, environmental market, 114-115
- NEDO. See New Energy and Industrial Technology Development Organization
- Negotiated rulemaking processes, 267
- NEPP. See National Environmental Policy Plan
- NESHAP. See National Emission Standards for Hazardous Air Pollutants
- NETAC. See National Environmental Technology Applications Corp.
- Netherlands  
     development of cleaner production technologies, 10  
     environmental technology research and development, 318-320  
     pollution control expenditures, 199, 202-203,207  
     technical assistance program, 22
- Netherlands Agency for Energy and the Environment, 319
- Netherlands Environmental Policy Plan, 212, 318
- Netting, 279-280, 283
- New Energy and Industrial Technology Development Organization, 16  
     research and development, 292, 311-313
- New Sunshine Program, 312-313
- Newly industrialized countries  
     compliance costs, 20  
     pollution abatement and control costs, 203,205,207
- NICE<sup>3</sup>. See National Industrial Competitiveness Through Efficiency: Energy, Environment and Economics program
- NICs. See Newly industrialized countries
- NIRE. See National Institute for Resources and Environment
- NIST. See National Institute of Standards and Technology
- Nitrogen oxides, 131-132, 281-282  
     national differences in control standards, 226
- NOAA. See National Oceanographic and Atmospheric Administration
- North American Free Trade Agreement, 37, 66
- NOVEM. See Netherlands Agency for Energy and the Environment
- NSF. See National Science Foundation
- NTDB. See National Trade Data Bank
- OECD. See Organization for Economic Cooperation and Development
- Office of Environmental Education, 53
- Office of Industrial Technology, 46,48,303-304
- Office of Pollution Prevention and Toxics, 307
- Office of Science and Technology Policy, 295
- Ohio, environmental services, 253
- OIT. See Office of Industrial Technology
- One-pipe-at-a-time approach, 267-268
- Organization for Economic Cooperation and Development, 65, 74  
     environmental markets estimate, 8, 10
- OSTP. See Office of Science and Technology Policy
- Overseas commercial service, 168, 170-172
- PACE. See Pollution Abatement and Control Expenditure
- Per capita income, 72-73
- PERF. See Petroleum Environmental Research Forum
- Performance standards, 272-274,275
- Petroleum Environmental Research Forum, 300
- PFBC. See Pressurized fluidized bed combustion
- Photovoltaic cells, 146, 147-148,302
- Photovoltaics for Utility Scale Applications, 148, 302
- Policy options. See Federal policies
- Polluter pays principle, 186,260
- Pollution abatement and control  
     accuracy of cost estimates, 196-197, 222-225  
     future costs, 194-196  
     government measures of costs, 188-189  
     interaction with pollution prevention, 81  
     mobile source, 130-133  
     national differences in standards, 226-228  
     overview, 183-186  
     relationship between regulations and competitiveness, 214-221  
     sources of underreporting of costs, 222-225  
     stationary source, 130-133  
     U.S. compliance costs compared with other nations, 197-214  
     U.S. expenditures, 186-194
- Pollution Abatement and Control Expenditure, 69, 222-225

- Pollution Control Loan program, 208**
- Pollution prevention**
  - capital accounting, 248-249
  - in the chemical industry, 240-241
  - cost savings, 232-236
  - financial assistance, 260-261
  - financial incentives, 231
  - in-process changes among countries, 232
  - interaction with pollution control, 81, 82
  - investment practices, 248-250
  - limiting factors, 244-247
  - options, 6, 237-244
  - organizational and technological change, 236-237
  - overview, 229-230
  - rate of adoption, 231-232
  - and recycling, 230, 242-244
  - regulatory barriers, 248
  - shift from control to prevention, 2
  - social benefits, 250
  - technical assistance, 22, 50-51, 251-260
  - technology development, 149, 230-231, 250-251
- Pollution Prevention Act of 1990, 229**
- Pollution Prevention Incentives for the States program, 54, 252**
- Pollution Prevention Information Clearinghouse, 254**
- Pollution Prevention Pays program, 234**
- Population growth, 72-73**
- Porter, Michael, hypothesis, 83-84**
- POTWs. *See* Publicly owned water treatment works
- PPIS. *See* Pollution Prevention Incentives for the States program
- Pressurized fluidized bed combustion, 144-145
- Prevention of Significant Deterioration, 275
- Private Investment and Trade Opportunities Organization, 172
- Process industries, compliance costs, 19
- Process modifications, 238-242
- Procurement policies, 50, 258
- Product cycles, 77
- Product design, and competitiveness, 75-76
- Product reformulation, 238
- Productivity, and environmental regulation, 323-325
- PSD. *See* Prevention of Significant Deterioration
- Public Utility Regulatory Policy Act, 124
- Publicly owned water treatment works, 259
- Pulp and paper industry
  - costs of pollution prevention, 234-235
  - pollution prevention practices, 232
  - process modifications, 239, 242
- PV Manufacturing Technology Program, 148, 302
- PVS. *See* Photovoltaic cells
- PVUSA. *See* Photovoltaics for Utility Scale Applications
- Raw material substitution, 238
- RCRA. *See* Resource Conservation and Recovery Act
- R&D. *See* Research and development
- RECLAIM. *See* Regional Clean Air Incentives Market
- Recycling, *See also* Pollution abatement and control; Pollution prevention
  - cost savings, 6, 232-236
  - external recycling, 242-244
  - and pollution prevention, 230
  - rate of adoption, 231-232
- Reg-neg. *See* Negotiated rulemaking processes
- Regional Clean Air Incentives Market, 281-282
- Regulations, *See* Environmental regulations
- Regulatory reform, 32-34, 54-58. *See also* Economic incentives
  - formulation of environmental regulations, 266-267
  - integrated permitting and inspection, 270-272
  - integrated regulation, 267-270
  - linkage with economic incentives, 265
  - overview, 265-266
  - performance standards, 272-274, 275
  - policy options, 32-34, 54-58
  - regulatory flexibility, 274, 276-277
- Remedial pollution control, 80-81, 82
- Remediation, 140-142
  - Department of Energy programs, 300, 302
- Renewable energy, 146-148
  - Department of Energy programs, 302
  - technology exports, 155
- Research and development
  - agency programs, 300-307
  - coordination and funding, 46-47
  - direct funding of individual firms, 296
  - European Community programs, 293, 314-317
  - federal laboratory technology cooperation, 296-297
  - in Germany, 293, 317-318
  - goals for federal policy, 43-46
  - government support of industry consortia, 297-300
  - environmental industry competitiveness, 127-128
  - international funding agencies, 16
  - in Japan, 293, 310-314
  - national government funding, 293

- in the Netherlands, 318-320
- overview, 291-293
- partnerships with industry, 47-49
- private sector, 29,223-224,308-310
- state and local programs, 308
- summary of federal policy options, 26, 28-30,43
- in the United States, 293-310
- Research Institute of Innovative Technology for the Earth, 313
- Resource Conservation and Recovery Act, 33,57,139, 227,276
- Resource management, 77-78
- Responsible Care program, 93
- Reverse trade missions, 172
- Risk Reduction Laboratory Pollution Prevention Research Branch, 252
- RITE. See Research Institute of Innovative Technology for the Earth
- S.978, proposed National Environmental Technology Act of 1993,45-46, 52
- Safe Drinking Water Act, 100
- Safety-Kleen, 139
- SARA. See Superfund Amendments and Reauthorization Act
- SBA. See Small Business Administration
- Scandinavian countries, pollution prevention, 10
- SCORE. See Service Corps of Retired Executives
- SCR. See Selective catalytic reduction
- Selective catalytic reduction, 131-132
- SEMATECH, 297
- Semiconductor manufacturing technology, 297
- Senate Finance Committee, 7
- SERDP. See Strategic Environmental Research and Development Program
- Service Corps of Retired Executives, 164
- SITE. See Superfund Innovative Technology Evaluation
- Small and medium-sized enterprises, technical assistance, 50-51
- Small Business Administration, 208-209
  - export financing, 180
- SMES. See Small and medium-sized enterprises
- Social welfare, and environmental regulation, 321-323
- Solar thermal systems, 147
- Solid waste industry, 138-140
- Source reduction, 244,269
  - lowering compliance costs, 6
- Source Reduction Review Project, 269
- South Coast Air Quality Management District, 100, 281-282
- South Korea, environmental market, 110-112
- Southern California Edison, 259
- SRRP. See Source Reduction Review Project
- Standard Industrial Classification, 93
- State pollution prevention programs, 252
- Stationary source air pollution, 130-133
- Steel industry, process modifications, 239,242
- Strategic Environmental Research and Development Program, 3-5
- Subcommittee on Environmental Technology, 46,295
- Sulfur dioxide, 130,281-282
  - national differences in control standards, 226
- Superfund** Act, 92, 139, 140-141, 194,224
- Superfund** Amendments and Reauthorization Act, 92
- Superfund** Innovative Technology Evaluation, 52,306
- Supplier links, 259-260
- Sustainable development, 1
- Taiwan, environmental market, 110-112
- Tax Reform Act, 208
- Taxes and fees, 25, 50,265,278
- Tax incentives, 207-210
- TCA. See Total Cost Accounting
- TDA. See Trade and Development Agency
- Technical assistance programs
  - comprehensive industrial service organizations, 255-256
  - encouraging other organizations to provide assistance, 258-260
  - federal procurement, 258
  - government programs, 251-252
  - integrating assistance into the permitting and inspection process, 257
  - limitations of current efforts, 252-255
  - multilateral cooperation, 34-35, 60-61
  - sectoral and industrial network approaches, 256-257
  - for small and medium-sized companies, 50-51
- Technological innovations, 73-74
  - and environmental regulations, 123, 214-216
  - incentives for, 285-286
  - process modifications, 239-242
- Technology cooperation, 176-177
- Technology evaluation, 51-52
- Technology policies
  - coordination and funding, 46-47

- goals for federal policy, 43-46
- needed advancements, 2
- partnerships with industry, 47-49
- summary of options, 26, 28-30, 43
- Tennessee, Center for Industrial Services, 22, 253
- Thailand power project, 169-170
- Thermie program, 316
- Third Framework Program, 315-316
- 3M
  - flexible permitting systems, 275
  - pollution prevention program, 234
- Tied aid credits, 181
- Tied feasibility studies, 174-175
- Tipping fees, 280-281
- Total Cost Accounting, 248-249
- Total quality management, 236-237
- Total suspended particulate, 226
- Toxic Release Inventory, 92-93, 213
- TPCC. See Trade Promotion Coordinating Committee
- TQM. See Total quality management
- Tradable permits, 25
- Trade agreements, 37-38, 216-220
- Trade and Development Agency, 35-36, 62, 130
  - feasibility studies, 175-176
- Trade and environment policy, 37-38, 65-68
- Trade fairs, 167, 168
- Trade Information Center, 157-158
- Trade issues, 37-38, 65-68
- Trade missions, 167, 169-170
- Trade Promotion Coordinating Committee, 36, 62, 157-158
  - Thailand power project, 169-170
- Trading programs, 280, 283
- TRI. See Toxic Release Inventory
- TSP. See Total suspended particulate
  
- UNCED. See United Nations Conference on Environment and Development
- United Nations Conference on Environment and Development, 65
- United Nations Environment Program, 23, 35, 60
- United Solar Systems Corp., 146
- United States
  - environmental industry competitiveness, 4-5, 12-17
  - environmental market, 99-101
  - environmental technology research and development, 294-310
  - environmental training program, 176-177
  - exported environmental products, 12
  - United States & Foreign Commercial Service, 64, 160, 168, 170-171
  - United States-ASEAN Council for Business and Technology, 159
  - United States-Asia Environmental Partnership, 11, 36, 61, 154
  - United States Council for Automotive Research, 134, 205, 298-299
  - United States Environmental Training Institute, 36, 61, 154, 176
  - U.S. Agency for International Development, 107
  - U.S. Technology for International Environmental Solutions, 306
  - U.S. TIES. See U.S. Technology for International Environmental Solutions
  - US-AEP. See United States-Asia Environmental Partnership
  - USAID. See U.S. Agency for International Development
  - USCAR. See United States Council for Automotive Research
  - USETI. See United States Environmental Training Institute
  - USFCS. See United States & Foreign Commercial Service
  - US&FCS. See United States & Foreign Commercial Service
- Vehicle emissions controls, 133-135
- Vendor Information System for Innovative Treatment Technologies, 172
- VISITT. See Vendor Information System for Innovative Treatment Technologies
- VOCs. See Volatile organic compounds
- Volatile organic compounds, 75-76, 96, 204-205
  - national differences in control standards, 226
- War Chest, 37, 63
- Waste and Release Reduction Program, 234
- Waste Management, Inc., 138
- Waste management programs, 300, 302
- Waste Minimization Assessment Centers, 54
- Waste minimization programs, 303-305
- Waste Reduction Always Pays program, 234
- Waste service industry, 138-140
- Wastewater treatment technologies, 135-138

- Water and **Wastewater** Equipment Manufacturers Association, 135-136
- Water Environmental Federation, 299
- Water pollution, 227
- Water treatment technologies, 135-138
- WEF. See Water Environmental Federation
- Western Europe, environmental market, 101-105
- Wind turbines, 146-147
- WMAC. See Waste Minimization Assessment Centers
- WMX Technologies, 138-139
- Wood furniture industry, 218-219
- Wood @P industry, 235
- World Bank, 73
- World Environmental Center, 172
- WRAP. See Waste Reduction Always Pays program
- WWEMA. See Water and **Wastewater** Equipment Manufacturers Association