

INDEX

- Abengoa Bioenergy, 111, 169–170
Acciona, 51
ACORE. *See* American Council on Renewable Energy (ACORE)
Air Products, 49
Akeena Solar, 36
Alekklett, Kjell, 146–147
Algae, 162–163, 170
Alga Technologies, 162
Allianz, 201
Altair Nanotechnologies Inc., 181–182
American Council on Renewable Energy (ACORE), 59, 168
American Enterprise Institute (AEI), 193
American Superconductor Corporation, 74–75
American Wind Energy Association (AWEA), 59
Anaerobic digesters, 112
Andalay system, 36
Applied Materials, 40
AquaBuOY, 104–105
Arctic Sea, 198
Arise Technologies, 31
Ascent Solar, 31, 48
Asia-Pacific Economic Cooperation (APEC), 200
Attenuator, 97–98
Ausra, 34
Australia, 83, 207
Automobile industry, 183
AWEA. *See* American Wind Energy Association (AWEA), 59

Banking industry, 200
Barrage generators, 97
Baseload utility generation, 82
Batteries, high-performance, 179–183, 184

Beacon Power Corporation, 72–73
Bedard, Roger, 98
Bekon Energy Technologies, 115, 116
Bezdek, Roger, 25
Binary cycle plants, 80
Biodiesel, 151
 advantages, 161
 from algae, 162–163
 incentives, 171–172
 market, 170–171
 U.S. production, 166
Biofuels, 149–150, 155–172
 complexities of, 156–163
 global market and production, 166
 and greenhouse gas emissions, 164
 how much can be made, 163–164
 incentives and investment, 166–170
 net energy, 164–166
 production, 156, 168
Biogas, 109–117
Bioprocess Group, 169
Black and Veatch, 102
Blackout, 40
BlueFire Ethanol Fuels, 168
Boats, 63–64
Bolivia, 183
Bourdaire, Jean-Marie, 134
BP Oil, 171
Bradford, Travis, 33
Branson, Richard, 216
Brazil, 157, 166
Breeder reactors, 17, 20
BrightSource Energy, 34
British Wind Energy Association (BWEA), 60
Brown, Jeffrey, 139
Brown, Lester, 167

- Building integrated photovoltaics (BIPV), 31
- Bush, George W., 193–194, 207
- Business community, 200–201
- Butanol, 168

- Caisse de Depot, 210
- California
 - energy conservation, 120
 - EPA Headquarters building, 121–122
 - and geothermal power, 83
 - and global warming, 191
 - and photovoltaics, 34
 - progress toward renewable energy goals, 42
 - renewable portfolio standards, 66
 - and solar power, 41–42
 - and wind power, 57, 77
- California Air Resources Board (CARB), 176
- California Independent System Operator, 72
- Cameco Corporation, 19
- Campbell, Colin, 6, 137
- Canada, 6, 7, 146–147, 207
- Cantarell oil field, 146
- Cape Wind project, 76
- Capstone Turbine, 116–117
- Carbon capture and sequestration (CCS), 15–16
- Carbon credits, 209, 211
- Carbon dioxide (CO₂), 64, 65, 121, 197, 206
- Carbon emissions, 151, 189, 205, 206. *See also* Greenhouse gases
 - and biodiesel, 161
 - and climate change, 196
 - and ethanol, 158
- Carbon Financial Instrument (CFI), 111
- Carbon futures contracts, 209, 211
- Carbon-offset projects, 207
- Carbon trading, 87, 200, 203, 205–214
- Carbon Trust, 102
- Cargill, 114
- Carmanah Technologies, 124

- CCS (carbon capture and sequestration), 15–16
- CDM. *See* Clean Development Mechanism (CDM)
- Cellulosic ethanol, 151–152, 159–161, 165–166, 168
- Center for Naval Analyses, 194
- Ceres, 201
- Certified Emission Reductions (CERs), 207, 208–211, 212
- CFLs (compact fluorescent lamps), 123, 218
- Chicago Climate Exchange, 111, 209, 213
- Chile, 183
- China
 - biodiesel production, 171
 - carbon credits, 212
 - carbon emissions, 214
 - coal production, 14
 - ethanol production, 166
 - peak coal, 217
 - solar power, 33
- Chrétien, Jean, 207
- Citrus Energy LLC, 170
- Clean Air Act, 191
- Clean Development Mechanism (CDM), 208–209, 211–212
- Clean Edge, Inc., 32, 55, 127, 166
- Climate change. *See also* Global warming and Bush administration, 193–194
 - Pentagon report, 194–195
 - political response, 201–202
 - as security issue, 195
 - warnings, 190–192
 - and wind power, 64–65
- Climate Exchange Plc, 213
- Clinton Foundation, 201
- CO₂. *See* Carbon dioxide (CO₂)
- CO₂ equivalent (CO₂E), 111
- Coal
 - China, 14
 - consumption rate, 13
 - costs, 37–38, 64
 - and global warming, 15
 - peak, 12–16, 38, 217

- as primary source of grid power, 37
 - production, 13, 14, 16
 - in U.S., 12–13, 14
 - world production and reserves, 13–14, 15
- Coal-to-liquids (CTL) production, 15, 151
- Commodity market, carbon, 210
- Compact fluorescent lamps (CFLs), 123, 218
- Composite Technology Corporation, 130
- Converge, Inc., 128–129
- Concentrated animal feedlot operations (CAFO), 112
- Concentrating solar power (CSP), 27, 28, 50–51
- Conductive polymers, 49
- Conservation, energy, 119–130
- Copper indium gallium selenide (CIGS), 30
- Copulos, Milton, 150
- Corn, 151, 156, 157, 159, 170
- Corn ethanol, 159, 165, 167, 168
- Cornwall Ontario River Energy (CORE), 106
- Corporate average fuel economy standard (CAFE), 177
- Cree, Inc., 124–125
- CSP. *See* Concentrating solar power (CSP)
- Cuomo, Andrew M., 192

- Dal Ferro, Benoit, 101
- Danish Wind Energy Association, 68
- Daukoru, Edmund, 175
- Davis Langdon, 122
- Daystar Technologies, 48
- Demand management, electricity, 127–130
- Denmark, 68
- Department of Agriculture, U.S., 165
- Department of Energy, U.S., 60–61, 83
- Designated Operational Entity (DOE), 209
- Det Norske Veritas, 209
- Dioxin, 109
- Doerr, John, 217
- Drake, Alan, 152–153
- Dry fermentation, 115

- DTE Energy, 116
- D-VAR, 74–75

- Earth Policy Institute, 167
- Eastman Kodak, 126
- East River, 105–106
- Echelon Corporation, 129
- Eckhart, Michael, 60
- Economic and Social Commission for Asia and the Pacific (ESCAP), 110–111
- Ecosecurities Group, 213
- Ecosystem Marketplace, 210
- Efficiency, energy, 119–130
- Efficient fiber optics (EFO), 125
- EFO ICE, 125
- E10 fuel, 157, 158
- E85 fuel, 157–158
- Electricity
 - consumption, 98
 - demand management, 127–130
 - and geothermal power, 82–88
 - growth in demand, 127
 - and landfill gas, 110
 - and motor management, 126–127
 - off-peak production, 178
 - and photovoltaic (PV) cells, 27
 - production by coal, 12
 - and solar power, 36–40
 - transmission capacity, 127
 - and transportation, 152–153, 172
 - and wind power, 59, 60
 - world generation of, 16, 18, 37
- Electric Power Research Institute (EPRI), 98–99, 179
- Electrovaya, 181
- Emission trading system, 200
- Endesa, 211
- Enel, 211
- Ener1, 181
- Energetics, 20
- Energy
 - BTUs provided by wind power, 54–55
 - comparative costs of energy sources, 81
 - consumption, 133
 - cost of, 63

- Energy (*Continued*)
 density, 95, 96, 184
 efficient use of, 119–130
 intelligence, 127–130
 storage systems, 61, 73
 U.S. domestic capacity, 63
 world production by source, 24
- Energy Focus, Inc., 125
- Energy Independence and Security Act, 123, 175
- Energy Information Administration (EIA), 16, 18, 102
- Energy Policy Act of 2005, 66, 87, 99
- Energy Research Centre, 61
- Energy returned on energy invested (EROEI), 164–165
- Energy returned on investment (EROI), 164–166
- Energy Watch Group, 13, 20–22, 38
- EnerNoc, Inc., 128
- Enersis, 107
- England, 100–101
- Environment
 assessment by United Nations Environment Programme, 194
 benefits of generating landfill gas energy, 111–112
 impact of PHEVs, 178
- Environmental Power Corporation, 114, 115
- Environmental Protection Agency, U.S. (EPA), 65
- Enzymes, 169
- E.ON, 101, 103
- ESCAP. *See* Economic and Social Commission for Asia and the Pacific (ESCAP)
- Ethanol, 151–152, 156–161
 global production, 166
 incentives and investments, 166–170
 as replacement for petroleum, 158
 U.S. production, 167
- Europe, 60, 61, 100–101
- European Marine Energy Centre, 106–107
- European Union Emission Trading Scheme (EUETS), 209
- European Wind Energy Conference, 71
- EV1, 176
- Evergreen Solar, 44–45
- Export land model, 139–142
- Exports
 oil, 5, 138–142
 world liquid, 139
- ExternE, 64
- ExxonMobil, 193
- Factory farms, 112, 113
- Federal Energy Regulatory Commission (FERC), 99, 104
- Feedback loops, 197
- Feed-in tariff (FiT), 43–44
- Fiberblade S. A., 71
- Fiber-optic lighting, 125
- Finavera Renewables, 104–105
- FirmGreen Energy, 117
- First Solar, 47–48
- Fission, 17
- Flannery, Tim, 83
- Flex-fuel vehicles, 157–158, 176
- Florida, 202
- Florida Power & Light, 34
- Flywheel energy storage system, 73
- Food production, 148–150, 159
- Fossil fuels, 24, 53–54, 56
- Foucher, Samuel, 139
- FPL Energy, 58, 170
- Fuels, liquid, 151–152, 155
- Futures contracts, 209, 211
- Gaia hypothesis, 196
- Gamesa Corporation, 70
- Gas
 cost of imports, 8, 10
 costs compared with wind power, 64
 forecast, 7
 peak, 6–9, 217
 production, 7, 9
 supply and demand, 8
- Gasification process, 168
- Gas-to-liquids (GTL), 151
- Gawell, Karl, 85, 86

- Gay, Charles, 40
 General Electric (GE), 69, 76, 101, 103,
 113, 127, 217
 General Motors, 111, 176
 Generators, marine energy, 96–97
 Geodynamics, 83–84
 Geothermal Energy Association (GEA), 85
 Geothermal power, 28, 42, 79–93, 218
 accessible quads, 85
 benefits of, 81–82
 current production, 82–88
 financing, 87–88
 growth, 85–86
 heat pumps, 80–81
 incentives, 86–87
 investing in, 88–93
 potential, 84–85
 what it is, 80–81
 Germany
 solar power, 33, 43
 wind power, 55, 56, 60, 62
 Geysers geothermal plant, 42, 82, 83
 Global energy, 3–26
 Global warming, 189–203. *See also*
 Climate change
 and Big Oil, 193–194
 and business community, 200–201
 and coal, 15
 and reduced rainfall, 23
 Global Wind Energy Council, 55
 Goddard Space Flight Center, 111
 Goldman Sachs, 217
 Google, 35, 217
 Grain, 149
 Grandey, Gerald, 19–20
 Grantham, Jeremy, 193–194
 Grass, 160
 Green building, 120–122
 Green Building Initiative, 120
Green Chip International, 70
 Greenchipstocks.com, 219
 Green Exchange, 211
 Greenhouse gases, 54, 213. *See also*
 Carbon emissions
 and biofuels, 164
 and cellulosic ethanol, 160
 and coal use, 15
 and livestock waste, 112
 reducing emissions, 119
 and wind power, 64
 Green Star Products, Inc., 170
 Green tags, 87
 Grid power, 12, 34, 37, 39, 61

 Hall, Charles, 165, 166
 Harper, Stephen, 207
 Hartwig, Matt, 171
 Heat pumps, 80–81
 Heeger, Alan, 48–49
 Heinberg, Richard, 147, 149
 HelioVolt, 48
 Helius Energy, 171
 High-brightness LEDs, 124
 Highlands and Islands Enterprise, 106
 High-performance batteries, 179–183, 184
 Hirsch, Robert L., 25
 Hoku Scientific, 46
 Holmes, John, 196
 Holmstead, Jeffrey, 65
 Hopkins, Sam, 75
 Horse Hollow Wind Energy Center, 58
 Howard, John, 207
 HR 6, 177
 Huaneng, 211
 Hubbert's Peak, 134–135
 Hughes, J. David, 11
 Hybrid cars. *See* PHEVs (plug-in hybrid
 electric vehicles)
 Hybrid photovoltaic/thermal (PVT), 32
 Hydrofluorocarbon 23, 213
 Hydropower, 23, 27
 Hydro Technology Ventures, 107

 Iberdrola, 56, 103
 Iceland, 84
 Idaho, 89–90
 Incentives
 biodiesel, 171–172
 biofuels, 166–170
 geothermal, 86–87

- Incentives (*Continued*)
 - solar power, 41–44
 - wind power, 65–66
- India, 170–171, 214
- Indonesia, 214
- Infill drilling, 6
- Institute for the Analysis of Global Security, 178
- Insurance industry, 201
- Integrated circuits, 124
- Intergovernmental Panel on Climate Change, 92
- International Association of Insurance Supervisors, 201
- International Carbon Investors and Services, 200
- International Energy Agency, 166
- International Energy Outlook, 2007*, 16, 18, 36, 143
- Investments
 - biofuels, 166–170
 - biogas, 113–117
 - carbon credits, 211
 - energy conservation and efficiency, 122–130
 - geothermal energy, 88–93
 - marine energy, 102–108
 - oil prospects, 146
 - PHEVs, 179–183
 - renewable energy, 215–219
 - solar power, 44–51
 - wind power, 69–77
- Investor Network on Climate Risk, 201
- Iran, 6, 11, 142
- Jacobson, Mark, 164
- Japan, 157
 - biofuels production targets, 172
 - new vehicles fleet fuel economy, 177
 - and solar power, 33, 43, 44
- Jatropha, 161–162, 170–171
- Jenbacher engine, 113
- Jobs, wind power, 59, 67–68
- Joint Implementation (JI), 209
- Jones, Rob, 86
- Karsner, Andy, 83
- Kempton, Willett, 76
- Ki-moon, Ban, 194
- Kinetic hydropower system (KHPS), 105–106
- Kleiner Perkins Caufield and Byers, 217
- Konarka, 48, 49
- Koppelaar, Rembrandt, 15–16, 138
- Kunstler, James Howard, 149
- Kyoto Protocol, 64–65, 101, 189, 202–203, 206–207, 213–214
- Landfill gas, 109–112
- Landfill Methane Outreach Program, 113
- Lawrence Berkeley National Laboratory, 31
- LECG, 158
- LEDs (light-emitting diodes), 123–124
- LEED (Leadership in Energy and Environmental Design) certification, 120–122
- Levelized costs, 102
- LFG-to-energy (LFGTE), 110–111
- Lighting, 123–125, 218
- Light water nuclear reactors, 17
- Liposuction, 170
- Liquefied natural gas (LNG), 8, 10–12
- Liquid fuels, 151–152, 155
- Lithium, 183–185
- Lithium-Ion (Li-Ion) batteries, 180, 181, 183, 184
- Livestock waste, 112
- LNG (liquefied natural gas), 8, 10–12
- Lopez, T. Joseph, 195
- Lovelock, James, 196
- Lovins, Amory, 119
- Lubber, Mindy S., 201
- Lucent Technologies, 111
- MacDiarmid, Alan, 48–49
- Mandil, Claude, 12
- Manure, 112
- Marine current generators, 97
- Marine Current Turbines, 97

- Marine energy, 95–108. *See also* Tidal energy; Wave energy
 falling costs of, 101–102
 generators, 96–97
 investments, 102–108
 permits and power, 103–105
 potential, 98–101
 U.S. projects, 99–100
- Mascoma Corporation, 169
- Massachusetts, 76
- Materials science, 62
- MEMC Electronic Materials, 46
- Methane, 110, 111–112, 114, 197
- Mexico, 6, 146
- Microgy, 114
- Microturbines, 116–117
- Middle Atlantic Bight, 76
- Midwestern Greenhouse Gas Reduction Accord (MGA), 208
- Mills, David, 34
- Miscanthus, 160
- Morgan Stanley Carbon Bank, 211
- Motor fuels, 168, 171
- Motors, 185–186
 management, 126–127
- Municipal solid waste, 110
- Nanosolar, 31, 38
- National Commission on Energy Policy, 175
- National Defense Council Foundation, 150
- National Electrical Manufacturers Association (NEMA), 127
- National Farmers Union, 209
- National Renewable Energy Laboratory (NREL), 41, 61, 169
- Natural capital, 202–203
- Natural gas, 6, 12, 148, 217. *See also* Gas
- Natural Resources Defense Council (NRDC), 119
- Negawatts, 119–120
- Net energy, 164–166
- Nevada, 86, 217
- Nevada Solar One, 50, 51
- New Carbon Finance, 205, 210
- New York, 100, 191–192
- New York Stock Exchange, 210
- New Zealand, 84
- Nickel-metal hydride batteries, 180
- NIMBYism, 11, 19, 76
- NiMH batteries, 180
- Norsk Hydro, 101, 103, 107
- North American Electric Reliability Corporation, 127
- Norway, 142
- Novozymes, 169
- Nth Power LLC, 32
- Nuclear fuel reprocessing, 17
- Nuclear power, 27–28
 compared with wind power, 61, 64
 decommissioning costs, 23
 limits to, 18–23
 peak, 17–23
 reactors, 17–18
- Nymex Holdings, Inc., 210–211
- Ocean energy. *See* Marine energy
- Oceanlinx, 100
- Ocean Power Delivery, Ltd. *See* Pelamis Wave Power
- Ocean Power Technologies, 103–104
- Off-peak electricity, 178
- Oil
 discovery, 4–5
 exports, 5, 138–142
 and food production, 148–150
 forecast, 6, 7
 foreign, 133–153
 peak (*See* peak oil)
 as percent of energy consumption, 133
 prices compared with natural gas, 148
 production, 136–137, 144
 products made from a barrel of, 174
 prospects for future investment, 146
 reduction in domestic use, 175
 security issues, 150
 supply and demand, 5, 143–144, 145–147
 and transportation, 150–152, 155
- Oil companies, 193–194
- OPEC, 142–144, 146, 175–179

- Oregon, 98, 104
- Organic light-emitting diodes (OLEDs), 125
- Organic photovoltaics (OPV), 48–50
- Orkney, Scotland, 106–107
- Ormat Technologies, 82–83, 88–89
- Overtopper, 98
- Oxford Research Group, 19, 20
- Pacific Ethanol, 168–169
- Pacific Gas and Electric Company (PG&E), 100
- Parabolic trough system, 217
- Party's Over, The* (Heinberg), 147
- Patzek, Tad, 151, 166
- Peak coal, 12–16, 38, 217
- Peak energy, 3–23
- Peak gas, 6–9, 217
- Peak nuclear, 17–23
- Peak oil, 4–5, 25, 133, 134–142, 217
- Peak uranium, 19–23, 217
- Pelamis Wave Power, 98, 100, 101, 107
- Pentagon, 194–195
- Persian Gulf, 150
- PHEVs (plug-in hybrid electric vehicles), 152
 - cost-competitive vehicles, 177
 - environmental impact, 178
 - investment opportunities, 179–183
 - motors, 185–186
 - sales forecasts, 183
- Philippines, 83
- Phoenix Motorcars, 181–182, 185
- Photovoltaic (PV) cells, 27, 29–32
 - capacity, 34–44
 - costs, 35
 - improvements in technology, 40–41
 - organic, 48–50
 - production, 32, 33
- Pickens, T. Boone, 217
- Pimentel, David, 166
- Platts, 147
- Plug-in hybrid electric vehicles. *See* PHEVs (Plug-in hybrid electric vehicles)
- POET, 170
- Point absorber, 97
- Point Carbon, 205
- Politics
 - and climate change, 201–202
- Pollution, 205–214
- Portugal, 100, 107
- PowerBuoy, 103
- Powerfilm, Inc., 48
- Power generation, 82
- Precautionary principle, 197–199
- Premium Energy Efficiency Motors Program, 127
- Pressurized water reactors, 17
- Production tax credit (PTC), 66
- Prometheus Institute, 33
- PureCycle geothermal unit, 82
- PV cells. *See* Photovoltaic (PV) cells
- Qatar, 6, 11
- Raft River project, 89–90
- Rail transportation, 152–153
- Range Fuels, Inc., 168
- Rapier, Robert, 157, 158, 166
- Raser Technologies, 91–92, 93, 127
- Raymond, Lee, 193
- Recovered energy power generation (REG), 88–89
- Regional Greenhouse Gas Initiative (RGGI), 207–208
- Renewable energy
 - as investment opportunity, 215–219
- Renewable energy certificates (RECs), 87
- Renewable Energy Corporation, 46, 47
- Renewable Fuels Association, 168, 171
- Renewable Fuels Standard, 168, 175
- Renewable Northwest Project, 102
- Renewable portfolio standards (RPS), 41, 66, 87, 202
- Return on investment, 68. *See also* Energy returned on investment (EROI)
- Rhode Island, 100
- Rice, 157, 172
- Rogers, James, 39

- Roosevelt Island Tide Energy (RITE), 106
 Rubin, Jeffrey, 146
 Rudd, Kevin, 207
 Russia, 6, 10, 142, 146
- San Francisco Bay, 100
 Sarmiento, Antonio, 107
 Saudi Arabia, 142, 144
 Schochet, Daniel, 89
 Schools, green, 121
 SCHOTT, 51
 Schultz, George, 163
 Schwarzenegger, Arnold, 191
 Science Applications International Corporation (SAIC), 25
 Scotland, 75–76, 101, 106–107
 Security issues, 150, 195
 Set America Free Coalition, 178
 Shirakawa, Hideki, 48–49
 Siemens, 69, 127
 Sihwa Tidal Power Plant, 107
 Silicon, 29–30, 45, 46–47
 Silicon solar. *See* solar cells
 Simmons, Matthew, 26
 SKYShades, 49
 Smith, Philip, 20
 Smith, Russel E., 58
 Solar cells, 29–30
 Solargenix, 51–52
 Solar hot-water systems, 27, 28–29
 Solar power, 27–52
 cost parity with electricity, 36–40
 cost reductions, 35–36
 declining costs, 38
 demand for, 32
 history of technologies, 28–32
 incentives, 41–44
 investing in, 44–51
 Solar-powered LEDs, 124
 Solar roofing tiles, 31–32
 Solar thermal systems, 29
 Solel Solar Systems, 34, 51
 Solix Biofuels, 162
 South Korea, 107
 Soybean oil, 161
- Spain, 55, 103
 Spitzer, Eliot, 191–192
 Splinter, Mike, 40
 Steam power, 34, 80
 Stephen, Nicol, 101
 Stevens, John Paul, 191
 Stirling Energy Systems, 34
 Storage systems, 61, 71–74
 String Ribbon technology, 45
 Sugarcane, 157
 Sullivan, Gordon, 198–199
 SunOpta, 169
 SunPower, 31
 Suntech Power Holdings Co., Ltd., 36
 SuperPolymer technology, 181
 Supply and demand
 natural gas, 8
 oil, 5, 143–144, 145–147
 renewable energy, 202
 uranium, 19
 Supreme Court, U.S., 191–192
Survey of Energy Resources 2007, 101–102
 Sustainable Building Task Force, 122
 Swaziland, 171
 Switchgrass, 160, 163, 165–166, 169
 Symetron, 127
- Talisman Energy, 75–76
 Tar sands, 146–147
 TCP, Inc., 123
 Tejoori Limited, 115
 Terminator-oscillating water column, 98
 Termites, 169
 Texas, 57–58
 Texas Renewable Industries Association, 58
 Thin-film photovoltaics, 30–32, 48, 49
 Thomsen, Paul, 82–83
 Tidal energy, 28, 100. *See also* Marine energy
 Tidal stream generators, 97
 Tide farms, 97
 Toshiba, 127
 Total S.A., 103–104
 Toyota, 176
 Trading Emissions, 213

- Trains, electric, 152–153
 Transesterification, 161
 Transportation, 150–152, 155, 218
 and electric power, 152–153
 future of, 172
 Truly, Richard, 195
 Turbines, 53, 62, 70–71
 20:20:20 target, 171
2007 Joint Outlook on Renewable Energy in America, 168
- Union of Concerned Scientists, 193
 United Arab Emirates (UAE), 142
 United Nations, 192
 United Nations Environment Programme, 194
 United States
 biodiesel production, 166, 170
 biofuels productive capacity, 168
 coal, 12–13, 14
 ethanol production, 166, 167
 gas production peak, 7
 geothermal power, 82, 85–86
 and Kyoto Protocol, 64, 189, 207
 marine energy projects, 99–100
 nuclear power, 18
 oil imports, 138
 PV capacity, 34
 wind power, 55, 56–59
 United Technologies, 82
 UQM Technologies, 185
 Uranium, 17, 28, 217
 peak, 19–23
 production, 21, 22
 U.S. Geothermal, Inc., 89–90, 91
 U.S. Green Building Council (USGBC), 120
- Van Leeuwen, Jan Willem Storm, 20
 VA Tech Hydro, 107
 Verdant Power LLC, 100, 105–106
 Verenium Corporation, 169
 Vestas Wind Systems, 69, 70, 76
 Viteri, Xavier, 56
 Voltage regulation, 74–75
- Volt ampere reactive power (VAR), 74
 Vulcan Power Co., 86
- Wal-Mart, 217
 Washington, 57, 98, 100
 Waste Management, Inc., 113
 Wave and Tidal Energy Support Scheme, 104
 Wave energy, 97, 98–99. *See also* Marine energy
 Wave Energy Center, 107
 Wave farm, 100, 107
 Wave Hub, 100–101
 Wendling, Robert, 25
 Western Governor's Association (WGA), 86
 Western Regional Climate Action Initiative (WCI), 208
 Western Wind Energy Corporation, 77
 Weyerhaeuser Engineering, 126
 Wheat, 149
Who Killed the Electric Car?, 176, 180
 Wind power, 27, 53–77, 218
 annual capacity, 57
 available global resources, 54–55
 benefits of, 53–54
 and boats, 63–64
 and climate change, 64–65
 compared with nuclear energy, 61
 competitive advantage, 65–69
 costs, 60–65
 and electricity generation, 60
 in Europe, 60
 generating capacity, 55
 good sites for, 55
 incentives, 65–66
 innovations, 62–64
 installations, 67
 investing in, 69–77
 long-term outlook, 68–69
 offshore development, 75–77
 storage, 71–74
 in U.S., 56–59
 WindStrand, 71

- Windtech, 75
- Woodgrain Millwork, 126
- Wood-to-ethanol production, 169
- Woolsey, James, 163
- World Energy Council, 35, 55, 98
- World Energy Outlook 2006*, 166
- WorldWater & Solar Technologies Corporation, 51–52
- World Wildlife Fund, 213
- Wrage, Stephen, 64
- Zero-emission vehicle (ZEV) mandate, 176
- Zinc, 184–185
- Zinni, Anthony C., 195
- Zoltek, 70–71

