Index

A123, 114 Abella, Irene, 145, 147 Ablaza, Gerardo (Gerry), 147, 149-52 Abu Dhabi, 21, 75-76, 142, 223, 245n17 administrative divisions (barangays), in Manila, 145, 148, 260n14 Agency for International Development, U.S. (USAID), 106 agriculture, water for, 143 AIM, London Stock Exchange, 23 air-pocalypse, 1, 8 air pollution, 87, 187-88; air quality and climate change differentiated, 197; Beijing, 1, 2; deaths from, 5, 13, 112; jokes about water and, 141 airports, eco-city built near, 80-81 airstrips, 37-38 Alliance to Save Energy, 100 Amazon, 123 Angkosubroto, Husodo, 181, 181 ANJ Agri, 11, 175-79, 185; biogas plant, 177-78; IPO, 178; Ladong Jaya palm

plantation, 175, 177. *See also* Austindo Nusantara Jaya

Apple, 174

Asia: Asian miracle, 3; business-asusual view, 109; company strategy and approach, 123; developer strategy, 109-10; economic and population growth, poverty cycle in, 72; environmental emergency in, 1, 6, 209; environmental future of, 11-12; flooding in, 137, 138, 141-42; government use of companies for change, 10-11, 58, 211-12; poverty of East, 229n4; tall building trend in, 90-91, 109, 248n2; transition to greener, responsibility for, 209-11; vulnerability of, 6-7. See also Ecocities; population; specific topics Asian Development Bank, 139, 144 Asian Drama: An Inquiry in the Poverty of Nations (Myrdal), 72

Asia Pulp and Paper, 186, 215

Asia Society, 21, 100
Aso, Taro, 184
Assets Supervision and Administration
Commission (SASAC), 58
AT&T, 20
Austindo Nusantara Jaya (ANJ), 215–16.
See also ANJ Agri
Australia, 193, 196, 206, 261n33
automobile industry, 111–29; battery
technology, 113–14; in China, 31–32,
111, 115, 252n1; fuel subsidies, 113,
252n6; government backing in, 115,
121, 253n8; oil import and, 112, 252n4.
See also electric vehicles
Ayala Group, 144, 148, 150, 216

Bai, Charles, 22-23 Bangalore, 115-21; population of, 116; Silicon Valley and, 115, 116. See also MahindraReva Electric Vehicles Bangkok, Skytrain, 130 Bangladesh, 2 barangays (administrative divisions), 145, 148, 260n14 Barroso, José Manuel, 184 batteries, automobile innovation and, 113-14; nickel hydride and lithiumion, 123. See also BYD Beijing: air quality index of, 1; population, 244n6; smog, 2; train from Hong Kong to, 134 Belda, Alain, 21 Belitung, 175. See also ANJ Agri Bell Labs, 20 Benfield, Kaid, 97 Berkshire Hathaway, 10, 121 Berman, Elliot, 20 Berners-Lee, Tim, 121, 126 BHP Billiton, 175 bicycle strategy, 28 biofuels, palm oil, 143, 171 biogas, 177-78, 182

Bloomberg Businessweek, 121–22 Bloomberg New Energy Finance, 9, 28, 52, 234n5, 237n32, 239n3, 241n16 Bohai Bay, 198 Bombardier, 134, 161 Bonus turbines, 56 Boracay, 150 Borneo, 167-68, 171. See also palm plantations Boston Power, 114 botanical gardens, in Singapore, 69, 70 Bourbon, Lionel, 85 Boxing Power Plant, 200-201 Bradsher, Keith, 256n25 Brandler, Andrew, 187, 190, 194, 195-96, 197, 203 Britain, 7 British colony, in Hong Kong, 133, 142, British-Hong Kong company. See Swire Group Brunei, 252n4 Buffett, Warren, 10, 25, 121, 122, 122, 126 building codes, 95 Building Control Act, 99 buildings: Asian trend of tall, 90-91, 109, 248n2; CO₂ emissions from, 92, 248n4; costs for energy efficient, 94-95, 249n8; electricity consumption, 91-92; EPIs of Indian, 105, 250n27; GHG emissions from, 248n4; in global energy consumption, 92, 248n4; Hang Lung's energy saving, 100, 101; LEED-certified, 101, 106; MTR Corp., 135; retrofitting, 93, 98, 99, 101, 248n6; tallest, 91, 248n2. See also green buildings bullet train, 130 business-led innovation: in triple forces, 8. See also companies Business Week, 123 BYD, 112, 113, 121-27, 216; Buffet investment in, 10, 121, 122, 122, 126; electric taxis and, 126, 127; Shenzhen

biomass, scale of coal and, 201

black liquor, from palm oil, 177-78, 215

site of, 124–25, 255*n*17; solar ambitions of, 124; success and recognition, 254*n*16

California: Fukushima and, 230*n*7; wastewater treatment debate and, 261n33 Cameron, David, 203 Canadian Solar, 35, 216 capital, China's underpriced, 28-29, 52, 236119 capitalism, state-directed, 42, 53, 60 carbon credits, 104, 183 Carbon Disclosure Project, 103, 135 carbon emissions, 85, 103-4, 256n27, 265n2; buildings and, 92, 248n4; China's low-carbon programs, 76; China's main cities per capita, 74; electricity and, 187-88; Indonesia's carbon footprint, 169; responsibility for reducing, 209-11; transport share of world's, 112 carbon sink, peat as, 169 Cargill, 172, 173-74 cars. See automobile industry; electric vehicles

Carter, Jimmy, 7 Castle Peak Power Plant, 189, 194–95, 266n9

Cathay Pacific airline, 102, 103–4, 211 cement industry, 193; cement making process, 84; dust emissions, 247*n*33; GHG emissions, 84–87, 247*n*28; housing units report, 86, 247*n*30; manufacturing cost and impact, 85, 86; markets, 86; Mumbai lab and, 84, 85, 246*n*25; urbanization and, 87. See also Lafarge; Siam Cement Group Cement Sustainability Initiative, 85, 86,

221, 225 Chan, Ronnie, 100, 104 Cheh, John, 161, 163, 165 Chellaney, Brahma, 141, 142, 143, 258*n*3 Chemical Oxygen Demand (COD),

164-65

Cheng, Agnes, 162-63, 165, 262n39 Cheng King-ming. See Zheng Jianming Chernobyl, 35, 203, 204 Chew Men Leong, 153-54, 155, 157, 261n33 China: air-pocalypse in, 8; capital underpricing, 28-29, 52, 236n19; carbon emissions per capita, 74; cement-related emissions in, 85-86; challenge for, 28; city dwellers, number of, 90; clean energy investment in, 9; coal use in, 13, 14, 62, 194-95, 206, 232n3; company profitability in, 30-32, 52, 236n26, 241n16; construction and, 74; consumer spending and credit, 29; economic growth, 3, 28, 31, 32, 43; economic reforms of 1970s, 55-56, 111, 124; economic stimulus program, 115; energy consumption and GDP, 241n14; energy efficiency in US and, 9; energy intensity target of, 50; energy savings potential of building sector in, 92-93, 248n6; energy security and, 112, 125-26; environmental harm from policies, 213; failed company rescue in, 31; financial repression in, 29, 32, 61, 236n19; first nuclear power plant in, 202, 266n12; Five-Year Plans, 8, 9, 48, 50, 51, 57; foreign technology assimilation by, 49; GHG emissions of, 5, 6, 230n9; LEEDcertified buildings in, 101; local content rules, 49; local governments of, 30-32; low-carbon programs in, 76; lower manufacturing costs, 19-20, 27; low-income housing project in Chongqing, 84; market forces, 26-27; mass transit system, 74; megacities of, 74; mercantilist model of, 9-10; modernization and, 252n25; natural gas and, 14, 15; new private sector, 126; 1985 standard of living, 202, 266n11; NRDC study of pollution from textiles, 164; rail systems in, 130-36;

China: (continued)

savings policy, 26, 29, 61; Sino-foreign wind ventures, 47, 48–49, 55, 240*n*8; skyscrapers in, 91, 109, 244*n*11, 248*n*2; statist model used by, 28, 60–61; top-down economy of, 52–53; trade disputes between U.S. and, 32–33; traffic problem in, 124; underpriced capital, 28, 52; UN embargo of, 192; unique features of, 28–31, 236*n*20; urbanization, 73, 73, 90, 244*n*11, 244*n*15; water pollution in, 141, 142. *See also* Chinese government; companies; renewable energy; *specific companies*; *specific industries*

China Association of Automobile Manufacturers, 115

China Development Bank, 21, 33, 59, 215, 221, 222, 224, 228

China Longyuan Power Group, 216–17 China Ming Yang Wind Power Group, 23, 217

China Three Gorges, 58

Chinese government: companies funded by, 233*n*4; industry limits and, 31–32; local governments, 30–32; solar power, 20; wind power and, 47–50, 52–53, 241*n*18, 242*n*24

Chinese Wind Energy Equipment Association, 52

Chongqing, China, 77, 84 CII. See Confederation of Indian Industry CIMB, 130

cities: advantages of big, 75; ancientmodern balance for, 89; disease and, 74–75; most populous, 113; population density and, 71–72, 113, 244*n*6; principles for successful, 75. *See also* eco-cities; *specific cities*

Civic Exchange, 97, 163 civil society, 99, 166, 185, 209, 210, 211, 212, 214

clean air legislation, 7 Clean Development Mechanism, 49 climate change, 1–2, 21, 135, 168–69, 184, 190, 264*n*16; air quality distinguished from, 197; U.S. and, 6; water and, 139 Clinton, Hillary, 184

CLP Holdings, 10, 187-207, 217; adhere and prosper philosophy, 207; Australia and, 196, 206; awards, 188; biomass plant of, 200-201; Boxing Power Plant and, 200-201; Castle Peak Power Plant of, 189, 194-95, 266n9; CEO as of 2000, 195-96, 197; as China Light & Power, 191; CO emissions of, 188, 265n2; coal-fired plants of, 194-95, 206; cotton waste biofuel plant of, 200-201; first solar project of, 194; history of, 191-94; Kadoorie, M., pledge for, 188, 190; long-term thinking of Kadoorie family, 190, 191; Manifesto on Air Quality & Climate Change, 197; nuclear power and, 201–5, 266*n*12; renewables portfolio, 189-90, 205, 265n3; renewables target debate, 197; Research Institute, 198; transition away from coal, 196-97; 2010 renewable energy capacity, 198; wind power investment status, 198-99, 205; World War II and, 192

CO₂. See carbon emissions coal: biomass scale compared to, 201;
China's use of, 13, 14, 62, 194–95, 206, 232n3; China wind power replacing, 46, 240n7; cost advantages of electricity from, 195; death of miners, 13; electricity produced from wind compared to, 44–45; GHG percentage from, 232n2; global use of, 195, 232n2; predicted peak of use in China, 232n3 Coca-Cola, Swire bottling unit, 102, 104,

COD. *See* Chemical Oxygen Demand companies: contribution of Chinese, 27; government partnership with, 10–11, 58, 211–12; green building, 97–98;

143

importance of individual, 3; rescue of failed Chinese, 31; role of, 210; sustainability-focused, overview of, 215-28; vertically integrated, 161. See also specific companies competition, 10, 15-16 Confederation of Indian Industry (CII), conspicuous consumption, 78 Consumer Goods Forum, 175 consumers, 29, 139, 172; electric vehicles feared by, 119-20, 126 copycat investments, 31 Cosmo Oil Company, 76 cotton, 139, 161, 162, 164, 165; waste, 200-201 Cowley, Abraham, 69, 72 Cultural Revolution, 54, 58, 202 Cuyahoga River, fires in, 7 Cyclone Nargis, 1-2

Dabancheng wind farm, 47-48, 55, 56 Daya Bay nuclear plant, 201-4, 217 deaths, from air pollution, 5, 13, 112 deforestation: GHG emissions from, 168, 184. See also palm plantations Del Monte, 180, 218 demonstration projects, 48, 77, 87 Deng Xiaoping, 29, 54, 55-56, 79, 124-25, Denmark, 44, 54-55, 56 desalination, of water, 157-58, 160 Dole, 180 Dongfang Electric Corporation, 50, 217 Doonesbury, 174 Double Increase program, 48-49 Dow Jones Sustainability Indexes, 86, 135 DRAMs, 42 drinking water, 143-44, 148, 260n14. See also NEWater dust emissions, 247n33

East Asia, poverty of, 229n4 eco-cities, greenfield, 77-83; Jilin project, 80, 246n23; KPIs, 78, 246n20; LEEDcertified, 82, 82; Masdar, 75-76, 223, 245n17; metropolitan setting for, 83; notion of, 69; Sino-Singapore Tianjin Eco-city, 76-80, 142, 225; Songdo, 80-83, 87, 246n24; Suzhou project, 79-80, 246n22; toxic site choice for, 76-77 Economic Development Board, 155 economic growth: Asian miracle and, 3; bicycle strategy of, 28; China's, 3, 28, 31, 32, 43; pollution and, 5; poverty and, 72; Special Economic Zones, 124-25, 255117 economic reforms, China's 1970s, 55-56, economics. See specific renewable energies economic stimulus program, China's, 115 The Economist, 118 economy: China's top-down, 52-53; energy efficiency and, 109-10; urbanization advantages for, 244n15 Economy, Elizabeth, 11-12 Edison, Thomas, 17 electricity: annual lighting consumption in U.S., 248n5; carbon emissions and, 187-88; China and U.S. usable wind, 52; coal compared to wind, 44-45; coal-fired plants producing Asia's, 195; costs, 94-95; Hong Kong companies, 188; India's free, 139; measuring and saving, 105-6, 108; negawatts and, 93; underpricing, 213; U.S. wind portion of, 239n1; water treatment use of, 157 electricity consumption: of buildings, 91-92; Chan's goal for reduced, 100 electric vehicles, 112, 114-15; acceptance of, 127; consumer fears about, 119-20, 126; first, 117; fossil fuel and, 126; Hong Kong taxis, 126, 127; hybrid advantage over, 129; importance to China of, 125; markets, 126. See also BYD; MahindraReva Electric Vehicles

dyeing, fabric, 163, 164, 262n42

Emerson, Ralph Waldo, 13 emissions: dust, cement industry, 247n33; source of Hong Kong's, 195. See also carbon emissions; greenhouse gas energy: auditing, 181-82; Japan's policies on, 238n34. See also global energy energy consumption: big cities as more efficient for, 75, 244n15; of buildings, 91-92; China's potential for savings in, 92-93, 248n6; Lafarge on stages of buildings and, 92; in water treatment, 157 Energy Department, U.S., National Renewable Energy Laboratory, 34 energy efficiency: in China and US, 9; costs for buildings, 94-95, 249n8; economics, 109-10; Hang Lung company, 101; in Hong Kong, 97-98; Japan's innovations in, 7-8, 98; in

lighting, 97–98; waste conversion and, 150. See also Leadership in Energy Efficiency and Design energy security, in China, 112, 125–26 Engineer, Rumi P., 108 environmental awareness, 7, 231n11 environmental emergency, 1, 6, 209 environmental future, 11–12 Environmental Protection Agency, 7 Ernst & Young World Entrepreneur of the Year award, 160

Esquel, 10–11, 97–98, 139, 217–18; energy consumption reductions by, 163; Gaoming shirt factory of, 160–65; government funding and, 163; headquarters, 161; shirt fabric yards used by, 164; sustainability mind-set of, 145, 162

e20 electric car, 119, 120 European Union (EU): GHG emissions in China, US and, 6; palm oil companies in, 264*n*11; solar capacity in, 34, 237*n*31

EWI. See Water Industry Program Office Exxon, 20

fabric dyeing, 163, 164, 258n6, 262n42 factory conditions, 174-75 Fair Winds Charter, 211 Fast Company, 118, 122 feed-in-tariffs, 37, 41, 50 Finamore, Barbara, 164, 249n7, 262n43 financial crisis, 2008-2009, 24, 31, 50, 115, 118, 121, 124 financial repression, in China, 29, 32, 236n19; statist model and, 61 fires, 2, 7, 231n11 First Solar, 43, 218, 237n29 Five-Year Plans, China's, 8, 9, 48, 50, 51, floods, 137, 138, 141-42 forests, 173; climate change and, 168-69; importance of tropical, 168. See also rain forests fossil fuel, 6, 14, 34, 36, 42, 44, 45, 51, 76, 93, 126, 190, 209 Foster, Norman, 75 Four National Taps, 153 Fox, Robin Lane, 69 Foxconn, 174 Frommer, Glenn, 134, 135, 136 FTSE Good, 103, 135 fuel-cell vehicles, 114, 129 fuel subsidies, automobile, 113, 252n6 Fuji Xerox, 218 Fukushima nuclear disaster, 5, 8, 40, 203, 237*n*33; California and, 230*n*7; in triple disaster, 35-36

Gale International, 76, 81, 82, 226
Gamesa, 50
Gandhi, Mahatma, 106
Gaoming, water discharges issue in, 165.

See also Esquel
garden cities. See eco-cities, greenfield
Gardens by the Bay, Singapore, 69, 70
General Electric (GE), 50, 51, 61, 76, 218
General Motors (GM), 117, 124, 219
geothermal, in Japan, 36, 41, 238n38
George Mason University, 82

Germany, 20, 25, 34, 145, 173, 234n6, 235n16 GHG. See greenhouse gas Glaeser, Edward, 75 Glaxo, 159 global energy: buildings portion of, 92, 248n4; coal portion of, 195, 232n2; solar capacity and, 35; water treatment and, 157; wind portion of, 44, 51, 239n1 global population, urban, 244n15 Global Reporting Initiative (GRI), 108-9, 135, 152, 181 global warming, GHG emissions and, 190 Global Water Engineering, 182 Global Wind Energy Council, 45-46, 52, 239*n*1 GM. See General Motors Godrej, Jamshyd, 93, 106, 107, 108, 129 Godrej & Boyce, 106-9; annual sales, 107 Godrej Construction, 107 Goh Chok Tong, 2, 79, 157 Golden Agri-Resources, 173, 186 Goldman Sachs, MTR and, 134 Goldwind. See Xinjiang Goldwind Science & Technology Gomez, Joseph, 177 Gopalakrishnan, Kris, 105, 106, 251n28 government: companies in partnership with, 10-11, 58, 211-12; debate over private sector and, 152; green buildings and, 95, 100; role of, 209-10; water threat response, 143-44 government funding: in automobile industry, 115, 121, 253n8; cuts in Spain and Germany, 234n6; Esquel and, 163; Five Year Plans on renewable energy, 48; fossil fuel, 209; fuel subsidies, 113, 252n6; MTR Corp., 256n29; in South Korea, 42, 60; state-directed capitalism, 42, 53, 60; wind power, 50, 241118, 2421124 Great Giant Pineapple, 179-83, 182, 264n15; size and output, 180; sustainability unit, 180-81 Great Tohoku Earthquake, 35

Green Building Council, U.S., 82, 96, 106 green buildings: Asian business-asusual view towards, 109; awards, 100; comfort of, 94; father of, 107; Godrej & Boyce unique, 107; government and, 95, 100; India's first, 106; investment and commitment, 97; long-term approach to, 101; negawatt concept, 93; operating costs and returns from, 96; opportunity in, 110; savings from, 97-98; Singapore's program for, 98-100, 99; technology and, 94 Green Climate Fund, 81 greenfield projects. See eco-cities, greenfield greenhouse gas (GHG) emissions: big five, 230n9; from buildings, 248n4; cement-related, 84-87, 247n28; coal percentage of, 232n2; from deforestation, 168, 184; global, 5-6, 6, 23019; global warming and, 190; peat and, 169; REDD+ for reducing, 183-85, 264n16, 265n18 Green Mark Incentive Scheme for Existing Buildings, 98, 99 Greenpeace, 139, 171172, 173, 185, 196, 2.11 Greenwood, Peter, 196-97, 198 GRI. See Global Reporting Initiative grid parity, 34, 237n29 Guanting Wind Power Plant, 56 Guo Jian, 57, 58

Hanergy, 219
Hang Lung, 100, 101, 109
Hang Seng Sustainability Indices, 103
Hanwha SolarOne, 219
Haze InterMinisterial Committee, 2
Hitachi Smart cities, 219
Holcim-Lafarge merger, 83–84, 221
Hollande, Francois, 83
Honda, 117, 167, 219

Hong Kong: as British colony, 133, 142, 191; business support lack in, 211; electricity companies of, 188; electric taxis in, 126, 127; emissions in, source of, 195; energy-efficient companies in, 97–98; Kadoorie family office in, 190–91; population, 244*n*6; property prices in, 132–33; rail success story, 131; Shunfeng Photovoltaic International Limited, 224; solid waste treatment spending by, 88; space limitations in, 133; train to Beijing from, 134; typhoons, 135. *See also* CLP Holdings; Esquel

Hong Kong-United States Business
Council, 161
Ho Pin Power Station, 193
Huangpu River, floating pigs in, 141
Hughes, James, 237n29
Hu Jintao, 50, 61
Humphrey, Hubert, 100
Hurricane Sandy, 6, 135
Hurun Global Rich List, 30, 236n23
Hutchison Whampoa, 220
hybrid cars, 114, 127–29, 128; first plug-in,

Hong Kong Harbor, 88

122

Hydrochem, 158–59 hydrogen fuel-cell vehicles, 114, 129 hydrohub, Singapore's, 154–55 hydropower, 36, 45, 51, 217, 233*n*5 Hyflux, 71, 157–60, *158*, 220 Hyundai, 114, 124, 220

IBM, 187
IEA. *See* International Energy Agency
IFC. *See* International Finance Corp.
Ikea, 139
illegal logging, 167–68, 185, 263*n*1
IMF. *See* International Monetary Fund
Incheon International Airport, 80–81
India: cement industry, 84, 86;
first green building in, 106; free electricity in, 139; GHG emissions,

6, 230*n*9; Godrej's green apartments in, 108; Indo-U.S. Joint Clean Energy Project, 251*n*28; Maini on perceptions of, 120; outsourcing and, 105, 116; palm oil market in, 174; sustainability in, 108. *See also* Godrej & Boyce; Infosys; MahindraReva Electric Vehicles

Indian Green Building Council, 107, 118
Indonesia: Borneo part of, 167–68,
171; carbon footprint of, 169; fires
in, 2; fuel subsidies in, 113; GHG
emissions, 5–6, 230n9; lost revenue
from illegal logging, 185; most
populous island of, 177; Norway's
promise to, 185, 265n18; REDD+
and, 183–85, 264n16, 265n18. See also
ANJ Agri; Austindo Nusantara Jaya;
Great Giant Pineapple; Jakarta; rain
forests

Infosys, 105–6, 250*n*27, 251*n*28
initial public offering (IPO), 21, 58, 176, 178, 234*n*9, 235*n*17
Institute of Public and Environmental Affairs (IPE), 87, 247*n*33
intellectual property (IP), 30, 47, 58, 120
International Energy Agency (IEA), 45, 46, 248*n*4
International Finance Corp. (IFC), 21, 147

International Finance Corp. (IFC), 21, 147
International Monetary Fund (IMF), 113
International Star Award, 100
investments, copycat, 31
IP. See intellectual property
IPE. See Institute of Public and
Environmental Affairs
IPO. See initial public offering
Irrigation Works and Hydropower
Research Institute, 55

Al Jaber, Ahmed, 142 Jacobs Energie, 57, 58 Jain Irrigation, 220 Jakarta, 71; flooding in, 137, 138; population, 137, 244*n*6 Japan: construction boom of 1980s, KPIs. See key performance indicators 37-38; energy efficiency focus of, Krisno, Ruslan, 180, 182, 183 7-8, 98; energy policy, 238n34; Kyocera Group, 221 environmental protection in, 7; Kyoto, 88-89 Kyoto Protocol, 49, 183, 190, 196 feed-in tariffs in, 37, 41; geothermal energy in, 36, 41, 238n38; nuclear power in, 35-36; railway systems of, Lacamp, Philippe, 90, 102, 104, 143 Ladong Jaya palm plantation, 175, 177 129-36; Shinkansen bullet train of, 130; solar capacity of 2012, 37; solar Lafarge, 85, 87, 92, 221; merger with Holcim, 83-84; Mumbai lab project power in, 8, 35-42, 39; triple disaster of, 35-36. See also Fukushima nuclear of, 83-84, 246n25 disaster; Orix Lafont, Bruno, 63, 64, 84, 221 Jilin project, 80, 246n23 Lancaster, Richard, 194 Lau, Calvin, 23 Jinchang Solar, 194 Jinko, 221 Lau, Jane, 197 Joint Clean Energy Project, Indo-U.S., Lau, Steven, 203-4 Lawrence Berkeley Laboratory, 251n28 2511128 LDK, 222 Kadokawa, Daisaku, 89 Leadership in Energy Efficiency and Kadoorie, Eleazar (Elly), 191-92 Design (LEED), 82, 82, 96-97, 101, 106 Kadoorie, Lawrence, 192, 201, 202 Lee Hsien Loong, 2, 80 Lee Kuan Yew, 65, 69, 79, 153, 154, 242n3, Kadoorie, Michael, CLP Holdings and, 188-207; bottled message from, 246n22, 261n27 Lewis, Joanna, 59 199-200; long-term thinking of, 190, 191; on nuclear power, 204-5; pledge LG (Lucky-Goldstar), 113, 120, 222 Liberal Democratic Party, of Japan, 38 of, 188, 190 lighting: annual U.S. consumption, Kalimantan, palm plantation expansion in, 171 248n5; Esquel example of energy-Kan, Naoto, 36 efficient, 97-98; use of natural, 106 Li Keqiang, 203, 209, 212 Kendall, Gail, 197-98 Lim Chee Onn, 77, 79-80, 94, 245n19, Keppel Corporation, 71, 79-80, 158, 221, 2621135 246n23 Keynes, John Maynard, 1 limestone, 84 key performance indicators (KPIs), 78, Lincoln, Abraham, 44 Liu, Philip, 177 246n20 local content rules, in China, 49 Key Technologies R&D Program, 57 logging: illegal, 167-68, 185, 263n1; palm Kingston, Jeff, 36 Kit-Kat, spoof on Nestlé, 171-72, 172, 173 oil partnership with, 170 Kodak, 187 Loh, Christine, 88, 93, 163 London Stock Exchange, 23 Kohn Pedersen Fox, 76, 82 Ko Kheng Hwa, 78, 79, 245n19 Lopez, José, 173 Lovins, Amory, 93, 231n18 Korea: SUNY, 82. See also Songdo; South Korea Lucky-Goldstar. See LG Kowloon Canton Railway, 192 Lum, Olivia, 158, 158-59, 160, 220

MEMC Electronics Materials, Inc., 235n13 Mabus, Ray, 100 Mahindra, Anand, 121 mercury poisoning, 7 Mahindra & Mahindra, 222 Merkel, Angela, 184 MahindraReva Electric Vehicles, 10, 114, Mid-American Energy Holdings, 121 Millennium Development Goals, 149, 116, 116-21, 222-23; accolades, 118; Mahindra Group purchase of, 118 260n14 Mitsubishi, 76, 193 Maini, Chetan, 116, 116-21 Miyauchi, Yoshihiko, 40, 40, 41 Makurazaki Airport, 39 Mohamed, Mahathir, 153, 261n27 Malaysia, 70-71; energy exports, 252n4; MTR Corp., 131-36, 132; awards and rail systems in, 130; Singapore and, sustainability index, 256n26; 70-71, 153-54, 261n27 buildings of, 135; carbon assessments, Malaysia federation, 153, 154 256n27; government backing of, Maldives, 2, 214 256n29; ridership and size, 133; as mangrove reserves, 107, 137 sustainability leader, 134, 256n27; track Manila: barangays, 145, 148, 260n14; conditions before reforms, 259nn9-10; length, 134, 256n29 "new normal" rainfall in, 150-51; Mumbai lab, 83-84, 246n25 population, 146, 244n6; reforms Murakami, Atsushi, 39-40, 238n36 Musk, Elon, 119 under Ramos, 145-46; typhoons in, 145, 150; water shortage in, 145 Myanmar, Cyclone Nargis and, 1-2 Myrdal, Gunnar, 72 Manila Water, 145-53, 212, 260n14; accolades, 148, 152; disaster relief functions, 151; as private company, 152; Natalegawa, Marty, 137, 138 National Council for Electric Mobility, savings achieved by, 147; tap water access created by, 147; wastewater National Renewable Energy Laboratory, treatment plant, 150; water cost for customers, 145-46, 259n9 manufacturing: cement cost and impact, natural gas, 14, 15 natural lighting, 106 85, 86; China's lowered costs of, 19-20, natural resources, 112, 140; consumer 27; China's wind power, 47, 240n8, impact on policy, 139; profiting from, 241n18; dirty, 42; Pearl River Delta, 160, 196, 262n38; polysilicon, 22-24, 148 26-27; wind turbine, 9, 51-54, Natural Resources Defense Council (NRDC), 92, 162, 262n43 Nature Conservancy, 176 Mao Zedong, 91, 192, 201 Masdar, 75-76, 142, 223, 245n17 negawatts, 93 Mass Transit Rail. See MTR Corp. Nestlé, 139, 171-73, 172 Mathew, Anup, 107 NEWater, 144, 156, 156-58, 160 McElroy, Michael, 46, 62, 240n7 New York Stock Exchange (NYSE), 17, McKinsey & Co., 72, 73-75, 185, 244n15 19-20, 21, 24, 30, 39, 105 measurement, 105-6, 108, 181-82 Ng, Jeanne, 198 Nike, 174 megacities, 72, 74 membrane technology, water treatment, Norway, promise to Indonesia, 185, 265n18 159

NRDC. See Natural Resources Defense Council nuclear power, 15; CLP Holdings and, 201–5, 266n12; first station in China, 202, 266n12; in Japan, 35–36; storage, 203–4. See also Fukushima nuclear disaster NYSE. See New York Stock Exchange

Novozymes, 163-64

Obama, Barack, 251*n*28
O'Connor, Bernard, 128, 129
oil, 76; Asian reliance on imported, 112, 252*n*4; spills, 143, 258*n*6
ondol (underfloor), 82
ONE Energy Corp, 41
orangutans, 171, 172, 175, 216
Orix, solar power and, 11, 38, 39, 39–42, 223; energy management focus of, 41; geothermal plants of, 41, 238*n*38; unused airfields used by, 38
outsourcing, in India, 105, 116
owls, 176, 216

Pachauri, R. K., 21
palm oil, 264nn11–12; consumption, 170–
71, 264n12; Roundtable on Sustainable
Palm Oil, 172–74, 177, 178, 183, 186
palm plantations, 169–79; ANJ Agri
sustainability efforts, 175–79;
deforestation and, 169, 170; Ladong
Jaya, 175, 177; monoculture, 170;
Nestlé and, 171–73, 172; waste problem
of, 177
Panasonic, 41, 223–24

Panasonic, 41, 223–24 Panel on Climate Change, 21, 184 Parikh, Rohan, 105 Pasig River, 144, 146, 149, 152 Pearl River Delta, 73, 88, 160, 196, 262*n*38 peat soil, 169

Peninsula Hotel, 188, 191, 192 *People's Daily*, 1 Percy, Charles, 100 Persian Zoroastrians, 106 pesticides, ANJ Agri alternative to, 178 Philippines: debt struggles of, 152; government-business partnership in, 211-12; typhoon belt and, 145. See also Manila Water photovoltaic solar power, 17, 34; China and Taiwan production of, 239n40 pigs, Huangpu River floating, 141 PLANT, 41 plantations. See Great Giant Pineapple; palm plantations Platts, 188 poaching. See logging, illegal pollution: air, 1, 2, 5, 13, 87, 112, 141, 187-88; benign pollutants, 197; economic growth and, 5; environmental awareness from disasters, 7, 231n11; NRDC study, 164; railways reducing, 129; of rivers, 149; world's cities with most, 230n5. See also water pollution polysilicon (polycrystalline silicon) manufacturing, 22-24, 26-27, 42 population: Asian cities with most, 71-72, 113, 244n6; of Bangalore, 116; global urban, 244n15; growth, 75; of Jakarta, 137, 244*n*6; of Manila, 146, 244*n*6; poverty and economic growth and, 72; predictions, 75; of Seoul, 83, 244n6 Portugal, wind power in, 44 Posco, 82 poverty, 72, 202, 229n4, 230n8, 266n11 power plants. See CLP Holdings; utilities PricewaterhouseCoopers, 18, 31 Prince Charles, 184 Prius, 7, 114, 128, 128, 227 private sector, debate over government and, 152 profitability: of Chinese companies, 30-32, 52, 236n26, 241n16; natural resources and, 148; textile industry, 163 Project Zero, 150 protectionism, local, in China, 32, 126-27

Psy, 81 PUB. See Singapore Public Utilities Board public transportation, 132. See also MTR Corp.; railways Qin Xingcai, 114, 115, 253n8 railways, 129-36, 250n25; first high-speed trains, 129-30; speed and ridership, 130, 133; 2011 collision, 130, 250n25. See also MTR Corp. rain forests: Borneo, 168-69; illegal logging and, 167-68; palm plantation destruction of, 172; REDD+ protection plan, 183-85, 264n16, 265n18. See also ANJ Agri; palm plantations Ramos, Fidel, 146 REDD+, 183-85, 264n16, 265n18 Reliance Industries, 107 ReneSola, 22-23, 224 renewable energy, in China: company contribution to, 27; Five-Year Plans on, 8, 9, 48, 50, 51, 57; investment, 9, 231n14. See also specific companies; specific renewables Renewable Energy Support Law (2006), 49-50 REpower Systems Group, 57 residential solar, costs of, 34 resource underpricing, 213 retrofitting, 93, 98, 99, 101 Reva. See MahindraReva Electric Vehicles REVive, 119-20 Ride the Wind program, 48-49 Rinck, Jürgen, 58 rivers, 142-43, 149; fires in Cuyahoga, 7, 231n11; floating pigs in Huangpu River, 141; Pasig, 146. See also Pearl

Samsung Electronics, 23, 124 San Diego, wastewater treatment debate and, 261n33 SASAC. See Assets Supervision and Administration Commission savings, China's policy on, 26, 29, 61 SCG. See Siam Cement Group Schneider Electric, 76, 224 Schumpeter, Joseph, 26 Second Green Building Master Plan, 98 Securities and Exchange Commission, U.S., 233n4 Seligsohn, Deborah, 9 Sembcorp Industries, 71, 158, 225, 2621135 Seoul, 83, 89, 96, 199, 244n6 Shady Oaks, 59 shale (unconventional) natural gas, 14-15 Shanghai, building changes in, 90-91 Shanghai Tower, 91, 109, 244n11, 251n33 Shen Dechang, 52, 241n15 Shenzhen, Special Economic Zones in, 124-25, 255117 Shi Zhengrong, 17, 18, 19, 25-28, 43, 227; "Heroes of the Environment" title of, 21. See also Suntech Shunfeng Photovoltaic International Limited,33, 224 Siam Cement Group (SCG), 86-87, 225, 247nn31-32 Siemens, 51, 61, 76, 126, 157 Silicon Valley, Bangalore and, 115, 116 Sinar Mas, 139, 173, 174 Singapore: awards to, 100; botanical gardens of, 69, 70; energy-efficient building in, 94; fires suffocating, 2; government leadership in, 211; green building program of, 98-100, 99; hydrohub, 154-55; independence, 153, 260n25; Malaysia and, 70-71, 153-54, 261n27; population, 244n6; rainfall in, 153; resource efficiency track record, 79; road-pricing system, 70; sustainability commitment of, 69-70,

River Delta

Roundtable on Sustainable Palm Oil,

172-74, 177, 178, 183, 186

Russia, GHG emissions in, 230n9

43; utilities and, 37; wind power 87, 243n3; at time of independence, differences from, 61. See also Suntech 69; water consumption, 260n25; water scarcity and innovations, 71, 144-45, solar power, in China, 9, 15, 33, 231n14; BYD venturing into, 124; industry 153-56, 261*n*27; water sources policy dominance, 43, 239n40; jumpstart in, of, 157-58. See also Hyflux; Keppel 234n6; number of manufacturers, 31 Corporation; NEWater Singapore Building Construction solid waste treatment, Hong Kong Authority Academy, 99, 100 spending on, 88 SOM. See Skidmore Owings & Merrill Singapore Public Utilities Board (PUB), Son, Masayoshi, 226 153-56, 225 Singbridge, 11, 61, 71, 77, 78, 80 Songdo, 76, 80-83, 81, 87, 226, 246n24 Singh, Manmohan, 251n28 Sony, 124 Sino-Singapore Tianjin Eco-City, 11, South Korea: Songdo eco-city in, 80-83, 87, 246n24; state support model in, 76-80, 142, 225 Sinovel Wind Group Company Limited, 42, 60 Spain, 25, 34, 234n6, 235n16; wind power 226 Skidmore Owings & Merrill (SOM), 76 skyscrapers, 91, 109, 244n11, 248n2 Special Economic Zones, 124–25, 255n17 Stanley Steamer, 129 Skytrain, Bangkok's, 130 smart-grids, 15, 76, 212 state-directed capitalism, 42, 53, 60 State University of New York (SUNY), So, Jack, 134 Korea, 82 social license to operate, 104, 136, 151, 153, 179, 190, 210 statist model, 28, 60-61 Society for Protection of the Harbor, 88 steel industry, in China, 32, 236n26 SoftBank, 226 Stein, Herbert, 6 Stern Review, 168 solar capacity: in China, 237n32; in Stockholm Industry Water Award, 156 Europe, 34, 237*n*31; global, 35; of Japan in 2012, 37 storage: nuclear power, 203-4; wind and solar, 46 Solar City, 41 solar farms, airstrip converted to, 38 Strawberry Frog, 120 Suharto, 113, 185 Solarfun. See Hanwha SolarOne Sumatra. See ANJ Agri; Great Giant solar power: Canadian, 216; challenges facing, 42, 43; competition obstacle Pineapple for, 15-16; costs, 18-24, 27, 34, 42, Summers, Scott, 81 237n29; first practical use for, 20; Sunrayce USA, 117 Suntech, 17-28, 226-27; bankruptcy, global spread of, 34; government 25-26; contracts, 23-24, 235n13; debt funding of, 20; grid parity and, 34, 237n29; in Japan, 8, 35-42, 39; burden, 24; fall of, 18, 22; during Panasonic and, 223-24; panel price financial crisis of 2008-2009, 24; decline in 2011, 24; photovoltaic, Germany and Spain markets and, 25, 17, 34, 239n40; polysilicon 235*n*16; global solar sales in 2005, 19; manufacturing, 22-24; solutions for government grants to, 233n4; growth, widespread adoption of, 34; storage, 19-20, 21, 24, 234n7; international 46; Taiwan and, 239*n*40; thin-film, funding for, 21, 234n9; IPO, 21, 234n9, Suntech (continued)

235*n*17; market capitalization in 2007 and 2013, 236*n*18; new factory spending by, 24; remaining issues for understanding, 26; revolution perspective on, 42; sales figures, 21, 25; solar power challenges exemplified by, 42, 43; solar power spread due to, 19; strengths of, 27; success of, 17–18; taxation and, 30

SUNY. See State University of New York Sustainability Excellence Award, 256n26 Suzhou project, 79–80, 246n22 Suzlon Energy Limited, 227 Swire, John, 102 Swire, Merlin, 102 Swire Group, 102–5, 108, 250n20; CocaCola bottling unit, 102, 104, 143 Switzerland, 35, 57, 173, 194

Tahija, George, 167, 176, 176–79, 185
Taiwan, photovoltaic cell production, 239*n*40
Taiwan Cement Co., 193
Taiwan Semiconductor Manufacturing Company (TSMC), 43, 227
taxis, electric, 126, 127
Tech 100 list, 122, 254*n*16
Tesla, 118, 119
textile industry: NRDC and, 262*n*43;

textile industry: NRDC and, 262n43; NRDC study of pollution from textiles, 164; profitability, 163; water pollution from, 164, 262n40, 262n42. See also Esquel

Thatcher, Margaret, 189, 195 thin-film solar, 43

Tianjin Eco-city. *See* Sino-Singapore Tianjin Eco-City

Tianjin Lishen Batteries, 113–14, 115 timber poaching. *See* logging, illegal Tokyo: Fuji Xerox of, 218; population, 71, 244n6

Tokyo Electric Power Corp, 36

Tokyo Institute for Technology, 76 Toshiba, 238n38 Toyota, 114, 122, 127-29, 128, 136, 227 trade: China-U.S. disputes in, 32-33; illegal timber, 168, 185, 263n1 trains. See railways transportation: global carbon emissions from, 112. See also MTR Corp.; railways tropical agriculture. See palm plantations tropical Asia, wind power and, 199 TSMC. See Taiwan Semiconductor Manufacturing Company Tubig Para Sa Barangay (Water for the Barangay) program, 148, 260n14 typhoons, 6, 135, 145, 150-51

Uchiyamada, Takeshi, 128 UN. See United Nations underfloor, Korean (ondol), 82 underpricing; carbon and water 209-210; capital, 28-29, 32, 52, 213, 236n19 Unilever, 172, 173, 264n10 United Nations (UN), 192; Green Climate Fund, 81; REDD+ and, 184, 264n16 United Nations Intergovernmental Panel on Climate Change, 184, 264n16 United States (U.S.): annual lighting consumption in, 248n5; China's wind turbines compared with turbines made in, 62; climate change as less influential on, 6; energy efficiency in China and, 9; Fukushima impact on, 5, 230n7; GHG emissions in China, EU and, 6; global GHG emissions and, 230n9; government funding for solar power in, 20; Hong Kong-United States Business Council, 161; Indo-U.S. Joint Clean Energy Project, 251n28; luxury of time in, 214; natural gas in China and, 14; renewable energy investment by China and, 9; residential solar costs Germany and, 34; trade disputes

between China and, 32–33; wind portion of electricity, 239n1 urbanization: advantages of, 244n15; cement industry and, 87; China's, 73, 73, 90, 244n11, 244n15; global urban population, 244n15; rail systems and, 136; risk for cities from, 74 Urumqi, 48, 54, 54–55, 56, 59 U.S. See United States USAID. See Agency for International Development, U.S. utilities, 187, 216–17; Castle Peak Power

Plant, *189*, 194–95, 266*n*9; Singapore PUB, 153–56, 225; solar acceptance

and fears of, 37. See also CLP Holdings

van der Hoeven, Maria, 45 Vanguard I satellite, 20 Vensys Energiesysteme, 58, 60 Vestas, 48, 50–51, 58, 61, 228 Vicente storm, 135

Vodafone, 119

Wahid, Abdurrahman, 153
Wal-Mart, 172
Wang Chuanfu, 111, 112, 121, 122, 122–23;
on energy security, 125–26, 216
Wang Wenqi, 55
Wanxiang Group, 114
waste conversion, 150
waste tubes, in Korean eco-city, 82
wastewater treatment, 150, 154, 261n33.
See also NEWater

water, 138–66; agriculture and, 143; desalination, 157–58, 160; discharges, 165; Lee Kwan Yew's strategy for access to, 261n27; per capita availability, 142; Singapore water consumption, 260n25; young Asians concern over, 258n4. See also Manila Water

Water for the Barangay, See Tubig Para Sa Barangay Water Industry Program Office (EWI), 155
water pollution: China's, 141, 142; jokes about, 141; from textile industry, 164, 262n40, 262n42
water scarcity, 142–44, 165–66;
Singapore's challenge of, 153–56, 261n27
water treatment, 157, 159. See also wastewater treatment
water treaty, of Singapore, 154
Weihai wind farms, 198–99
Wei Hongliang, 58
Wen Jiabao, 53, 61, 79
White Paper on China's Energy Policy 2012, 51

Widodo, Joko, 137–38, 252*n*6 Wilmar International Group, 139, 172, 174, 186

wind power, 44–62; economics, 45–46; electricity produced from coal compared to, 44–45; global electricity percentage, 44; largest markets, 46; pricing, 45, 239*n*3; solar power differences from, 61; storage problem for solar and, 46; in tropical Asia, 199; U.S. electricity from, 239*n*1

wind power, in China, 74, 240n8; airstrips and, 38; competition obstacle for, 15-16; feed-in tariff for, 50; first wind farms, 47-48, 55, 56; global wind capacity ranking of, 51; government-funded, 50, 241n18, 242n24; government policy and, 47-50, 52-53; growth and capacity by 2010, 50; increased installed capacity, 50; installed base in 2013, 51; installed capacity, 62; manufacturing, 9, 51-54; price controls, 53; private-sector investor in, 199; top manufacturers, 241n18; 2013 capacity, 239n1; usable electricity, 52; wasted capacity problem, 52-53; world market share, 47, 50

wind turbines, China and: blade diameter, 45; capacity, 53; CLP, 198-99, 205; core module technology, 242n26; costs, 45, 52; Danish-made, 55, 56; demonstration projects 1970s-1990s, 242n20; first, 50, 240n13; foreign purchase of, 54-55; grid capacity, 53; joint ventures, 48-49, 240n8; largest companies for, 50; manufacturing, 9, 51-54, 61; market share, 240n8; profitability figures, 52, 241n16; Shanghai Tower, 109; Shen's prediction for, 52, 241n15; size, 45, 239n4; usable electricity from, 52; U.S.-made compared to Chinese, 62; wasted capacity, 52-53

Woetzel, Jonathan, 73–74
worker suicides, at Apple facilities, 174
World Bank, 81, 146, 184, 220, 229n4
World Business Council on Sustainable
Development, 221
World Council on Sustainable
Development, 85, 86, 221
World Economic Forum, 18, 40, 148
World Health Organization, 139, 230n5
World War II, CLP Holdings and, 192
World Wildlife Fund (WWF), 176; on
palm oil, 174, 264nn11–12
Wu Gang, 54, 55, 56, 58–60

WWF. See World Wildlife Fund

Xi'an, 123
Xiexin Wind Power, 59
Xi Jinping, 8
Xinjiang Goldwind Science &
Technology (Goldwind), 48, 50–60;
core module technology and, 242n26;
fatal accidents at, 60; government
backing of, 59, 242n24; IPO, 58; MW
wind capacity in 2013, 57, 242n23;
reason for success of, 57–60; recall,
59–60
Xinjiang Wind Energy Company, 55, 56,

Yallourn Power Plant, 196, 206
Yang, Marjorie, 161, 162, 165, 218
Yang, Y.L., 161
Yingli Green Energy Holding Company
Limited, 228
Young, Mark, 192
youth, Asian, water concerns of,
258n4

Yudhoyono, Susilo Bambang, 137–38, *138*, 184 Yu Yongding, 32

Zero Energy Building, in Singapore, 99 Zheng Jianming (Cheng King-ming), 33, 224

Zobel de Ayala, Fernando, 150