Index

Abu Dhabi 173-4
acid rain 13, 36
affluenza 10
agroforestry 62, 65
air pollution 13, 29, 35-6
air travel 133, 137
Alaska 38, 40
algal blooms 71
Amazon forest 55-6
Analogue Forestry 62
aquaculture 70
aquifer depletion 213
Arctic
  fossil-fuel resources 39, 40
  summer ice melt 38, 39-40, 50
Australia 11, 165, 170, 173, 177

Bangladesh 11, 15, 117-18, 136
Billion Tree Campaign 14, 62-3
biochar 14, 53, 67, 68-9, 107, 217
  sewage-derived 69
biodiesel 80, 212
biodigesters 105
biodiversity
  conservation 14, 53, 191
  in landscape design 18
  loss 51
bioenergy 212
biofuels 19, 56, 70, 79, 80, 81, 87-8, 204, 211-21
  algae biofuels 19, 217-20
  from crop and forestry residues 19, 215-17
  from farm crops 212-15
  greenhouse emissions 214, 215
  impact of land use changes 214
biogas 105, 129, 194
biomass 52, 56, 69, 79, 81, 87, 105, 107, 116, 129, 137, 212
biosequestration 13-14, 42, 52, 53, 63, 64, 69, 72, 124
Bolivia 118
Brazil 34, 55, 56, 81, 110, 179, 212
building-integrated PV (BIPV) 80
buildings
  energy use 125, 128, 130-1, 169
  green building standards 150, 152
  innovative housing 200
  passive house design 130
Bus Rapid Transit systems (BRTs) 110
Bush, George H. W. 33-4
Bush, George W. 143, 232

C40 sustainability initiative 168, 169
California 127-8, 135-6, 172
Canada 40, 81, 150, 170, 177
Canopy Capital 59-60
cap-and-trade systems 152
Carbon Capture and Storage (CCS) 13, 41-4, 50, 53, 81
  see also biosequestration
carbon credits and trading 58, 113, 114
carbon cycle 38, 53
carbon dioxide 49-73
  atmospheric concentrations 8, 38, 39, 45-6, 50
  see also biosequestration; Carbon Capture and Storage (CCS)
carbon dioxide emissions 9, 12, 36, 38, 45, 54, 58
  reduction targets 122
carbon neutral status 16, 102, 170, 173
carbon offsets 51, 72
carbon sequestration 51, 52, 54, 61, 62, 64-8, 69, 71-2, 233
carbon sinks 38, 52, 55, 62, 63-4, 231
carbon tax 152, 234
cars 32, 33, 34, 109, 131, 132-3, 134
charcoal 27, 68
  see also biochar
China
  car ownership 34, 109
  energy consumption 34, 136
  industrial boom 34
  localization strategies 185
  renewable energy 80, 81, 104, 151, 165-6
  resource consumption 57
  solar cities 165-6
  transport issues 108-9
  tree-planting schemes 63
circular metabolic systems 174-5
cities
  biodiversity in landscape design 18
  circular urban metabolism 18
  ecological footprints 18, 176-8
  energy efficiency retrofits 150, 169-70, 173
  metabolic systems 174-5
  new planning processes 179
  renewable energy strategies 17, 161-81
  resource flows 175-6
  smart growth planning 171-2
  solar cities 17, 165-6, 173-4, 180

solar suburbs 172-3
sustainable development 17-18, 168, 169, 179-80
sustainable transport 132, 170-1
urban-industrial growth 27, 34
Clean Development Mechanism (CDM) 15, 53, 61, 113-14, 115, 151
climate change 13, 25-46
fossil-fuel powered 26-34
global average temperature increases 37, 38
positive feedback loop 38, 40, 50
tipping points 37, 50, 230
climate change mitigation 12, 126, 157, 163, 192, 224
costs 45
opposition to 37
policy responses 34-46
climate justice 8
climate security 45-6, 134, 135, 184
coal 26, 27-8, 34, 35, 43, 76, 137
reserves 52
Colombia 110, 233
Combined Heat and Power (CHP) systems 129
compressed air energy storage (CAES) 92
Congo Basin Forest 57
cooking stoves 105-7, 118
cooperation and connectedness principle 20, 226-7
Copenhagen 170
Corn Laws 30, 187
Costa Rica 59, 118
Cuba 63, 108, 190-1
currencies, regional 18, 195-7
cycling 109

dams 108, 109
death 76
'debt for nature' swaps 118
'debt for renewables' 119
decentralized energy production 9, 95, 96, 103, 104
see also energy subsidiarity
deep saline formations 42
deforestation 9, 51, 54-5, 102, 214
'avoided deforestation' 58, 59
carbon emissions 9, 55, 58
economic impacts 54-5
and loss of sequestration capacity 54
through logging and farming 54, 55
demand-side management (DSM) 88-92, 97, 134
Denmark 17, 82, 84, 85, 94, 117, 129, 143, 170, 179, 192
desalination 96
desertification 14
developing countries
Feed-In Tariffs (FITs) 115-17
green-collar economy 156
per capita use of energy 163
renewable energy technologies 102, 103-10
technology transfer 8, 9, 111-13
development finance 111-13
Distribution System Operators (DSOs) 117
district heating (DH) systems 129
droughts 37, 45, 55, 56

ecolabelling 150, 189
Ecuador 60-1, 118
Egypt 66-8, 108
electric vehicles 89, 91, 108, 131, 153, 170
electricity
energy-efficient approach 125-6
global use of 45
non-access to 102
rural electrification 103-5
traditional networks 87
see also renewable energy
Energie-Cités 169
energy
ideal energy policies 138
limiting total per capita use 16, 136-7
projected global demand 34, 76, 123-4
proposed reduction in global demand 124
energy arbitrage 92
energy descent 16, 137-8, 186, 198
energy efficiency 16, 93, 121-38
barriers to 128
Combined Heat and Power (CHP) systems 129
economic benefits 126, 127
efficiency standards 16
energy performance contracting 129-30
financing 16, 130
job creation 148-9, 152
producer self-interests 126, 127
public procurement policies 16
rebound factor 128, 134
retrofits 150, 169-70
and social wellbeing 135
transport 131-3
energy equality 15-16, 101-19
energy literacy 89
energy productivity *see* energy efficiency
energy security 9, 34, 76, 81, 114, 123, 125, 136, 138, 204, 205

Energy Services Company (ESCO) 129-30
energy slaves 16, 122-3, 138
energy storage technologies 14, 88, 89-90, 91, 92, 150
energy subsidiarity 15, 92-6, 192
energy sufficiency 16, 41, 46, 122, 138, 237
  see also energy efficiency
ethanol 80, 108, 212, 213, 214
Ethiopia 63
eudaimonia 228
eutrophication 36
Extended Producer Responsibility 150

fair trade issues 150, 188-9
farming
  biodynamic 67
  carbon emissions 51
  Community Supported Agriculture (CSA) 189
  deforestation and 54, 55
  fair trade issues 188-9
  greenhouse gas emissions 187-8
  industrialization 30, 187, 188
  intensive 64
  organic 65, 67, 189, 190
  saltwater farming 69-70
  seed saving 191
  sustainable 14, 65
  urban agriculture 190-1
  see also soil
Feed-In Tariffs (FITs) 14, 77, 81, 82, 150-1, 164, 179, 193
  for developing countries 115-17
  local implementation 192
fertilizers 30, 66, 67
fishing 178
flooding 17, 37, 41
food miles 187, 189
food production 14, 53
  energy dependence 187
  fossil-fuelled 14
  localization 189-91
  see also farming
food security 65, 69, 188, 190, 191, 216
Forest Index 60
forest protection 53, 55, 61
forests
  carbon sequestration 53, 54, 61, 62
  ecosystem services 53, 54, 58, 59, 60
  global forest cover 53
  investment in 59-60
  land use changes 54, 55, 58, 214
  new demand for forest products 57-8
fossil-fuel combustion 13, 76
  climatic limits to 122
  industrial revolution and 26-34
fossil fuels
  approximate reserves 52
  carboniferous capitalism 28, 162, 225, 226
  cost-benefit analysis 45
  costs 43, 78
  energy descent 137-8
  financing 123
  formation 52
  globalization of the energy system 184
  rising use of 123
free trade 30, 187
freeways 132
fuelwood 102, 105, 212
future justice policy principles 235-6

Gaia hypothesis 209
Gambia 118
gas 27, 39, 40, 42, 76, 137
  reserves 52
genetic engineering 62, 215, 216, 219, 220
geosequestration *see* Carbon Capture and Storage (CCS)
geothermal energy 79, 80, 81, 170
Germany 69, 111
  green-collar economy 17, 84, 143, 149
  industrialization 30
  regional currencies 196
  renewable energy 9, 14, 81, 82-4, 85, 96, 149, 150-1, 192-3, 194
Ghana 103, 108
Global Canopy Programme (GCP) 55, 58, 59
Global Energy Network Institute (GENI) 119
Global Environment Facility (GEF) 109, 111, 112-13
global financial crisis 20
global warming *see* climate change
globalization 18, 186
  economic 179, 184
  of food production 187
  fossil-fuelled 186
Gore, Al 12, 96, 180
Grameen Shakti 15, 117-18
Green Belt Movement 14, 62
green charcoal briquettes 107
green-collar economy 16-17, 81, 82, 110, 141-58
  business drivers 152-3
  core principles and common features 144, 146
  definitions 143-4, 145-6

greening of existing jobs 17, 142, 143
impediments to 155-7
moving into 146-7
policy drivers 149-52
renewables and efficiency job creation 148-9
sectors and positions 143, 146-8
green constitutions 60-1
Green New Deals 153-5
greenhouse gas (GHG) concentrations 38, 45
greenhouse gas (GHG) emissions 38, 40, 50, 115
reduction targets 45, 171
sources of 54, 55, 65, 108, 187-8, 213
trading systems 58, 113, 114, 172
urban 17, 169
Greenland 40-1
Gridlights 89
Gross Domestic Product (GDP) 227-8
Guyana 60

halophytes 70
Hansen, Jim 8, 12, 41, 50, 72
happiness and wellbeing, alternative indicators of 226
high voltage direct current (HVDC) cables 93
hybrid systems 104, 105, 107, 152
hydrogen powered vehicles 110, 132-3, 170
hydropower 79, 84, 105, 108
ecological impact of 108
small hydropower 81, 108, 116

iJet 107
independent power producers (IPPs) 116-17
India 34, 108, 109
average per capita energy use 136
biodiversity conservation 191
renewable energy 104, 115, 151
solar cities 165
industrial revolution 13, 26-34, 44
insecuritization 18, 185
Intergovernmental Panel on Climate Change (IPCC) 12, 37, 50
International Council on Local Environment Initiatives (ICLEI) 169
International Energy Agency (IEA) 43, 76, 86, 123
International Renewable Energy Agency (IRENA) 9, 16, 86

Japan 82, 134
Jevons Paradox 134
just-in-time supply 186

Kenya 14, 37, 62, 104
Kyoto Protocol 15, 36-7, 38, 52, 58, 72, 113, 143, 171, 231-2
Kyoto2 proposals 232

limited liability concept 29
linear concentrator systems 107
localization 18, 183-200
currencies 18, 195-7
decarbonization initiatives 199-200
energy supplies 88, 192-4
food supplies 187-91
globalization vs. localization debate 184, 185, 186
origins of 185
social benefits 186
Transition Movement 18, 197-9
locavores 189
logging 54, 55, 57
London 29-30, 35, 128, 162, 167, 168, 176, 177
Low Carbon Communities Network (LCCN) 199-200

Madagascar 118
Maldives 16, 102
mangroves 70
Masdar City 173-4
megacities 31-2, 93, 168
methane 38, 190
Mexico 34, 35, 104
micro credit schemes 117-18
microgeneration 88, 136, 193
Millennium Development Goals (MDGs) 103, 230
mini-grid systems 104, 105, 115, 116, 117
Mondragón Corporacion Cooperativa 194-5
money flows, redirection of 229-30
monopolization 82, 96
Moura 163-4, 180
mutuality, culture of 228

Negawatt Power 125-6, 127
neo-liberalism 184
Netherlands 111
New York City 31, 32, 171
Niger 233
Nigeria 102-3, 225
nitrogen oxide emissions 36, 213
nuclear energy 18-19, 204-11
arguments against 205-11
fast-breeder reactors 208, 210
'friends in high places' strategy 18, 19, 211
fusion reactors 208

legacy issue 204, 209
operational safety 206
pro-nuclear view 205, 208, 209
toxic wastes 207

Obama, Barack 15, 38, 86, 141, 142
oceans
acidification 51, 71
carbon sequestration 71-2
oil 27, 32, 33, 34, 39, 40, 42, 76, 225
and military conflicts 33-4
reserves 52
One Planet Living 200
open source movement 228-9

Papua New Guinea 59
pasture management 65
peak oil 64, 137, 184
permafrost 38
Philippines 109, 118
photovoltaics 78, 88, 96, 104, 112-13, 221
see also solar energy
pollution 213
population growth 27, 31
Portugal 163-4
post-industrial societies 34
power distribution companies 91
power plants 13, 43
Combined Heat and Power (CHP) systems 129
solar 163-5
Power Purchase Agreements (PPAs) 117
precautionary principle 224
Proactive Investment in Natural Capital (PINC) 59
problem technologies 18-19, 203-21
Prometheus myth 44
Property Assessment for Clean Energy (PACE) 135-6
public sector procurement 150, 151
public transport 109-10, 132, 171
pumped hydro storage (PHS) 92
pyrolysis process 69, 217

rail transport 27, 28-9, 35, 132, 133
recycling 150, 179
Reducing Emissions from Deforestation and Degradation (REDD) 58-9
reforestation 14, 51, 53, 233
benefits 61-2, 72
carbon sequestration 51, 61, 233
monoculture tree plantations 51, 62, 69
sink projects 51
timber supplies 61-2
tree-planting initiatives 62-3
refrigerators 134
regulated service concessions 117
renewable energy 8-9, 14-15, 45, 75-98, 102
cost trends 78-9
cyclical benefits of 77
demand-side management (DSM) 88-92, 97
deployment 79-81
in developing countries 102, 103-10
economic gains 9, 84, 92
economies of scale and efficiency 77-8, 79, 92
and energy efficiency 124-5
financing 78, 81, 88, 91-2, 105, 111-12, 114-17, 118, 164
infrastructure issues 87-8, 95
job creation 9, 146, 148-9, 157
local RE 88, 192-4
policies and targets 81-2
policy drivers 150
political issues 15, 85-6, 105
potential for 100% renewables 96-7
as prerequisite for development 102
public engagement with 15, 81-2, 84-5, 89
quota systems 82
for rural electrification 11, 103-5
supergrids 15, 93-5, 96
technical issues 87-8
for transport 110-11
see also Feed-In Tariffs (FITs)
Renewable Energy and Energy Efficiency Partnership (REEEP) 112
Renewable Energy Payments (REPs) *see* Feed-In Tariffs
resilience 18, 65, 132, 184, 185, 186, 187, 195, 197, 198
Rights for Nature laws 60-1
Rio Earth Summit (1992) 15, 36
Rocky Mountain Institute (RMI) 125-6
rural energy service companies (RESCOs) 116, 117
rural-to-urban migration 65
Russia 38, 40

salinization 51, 70, 108
Salton Sea 70
saltwater farming 69-70
sea level rises 16, 17, 26, 41, 44-5, 102, 163, 206
seagrass meadows 71
SEKEM initiative 66-8
Seville 164-5
sewage discharges 71, 72
Siberia 38

slash-burn agriculture 68
smart grid technologies 88-9, 90, 91
smog 13, 36, 213
soil
  carbon loss 64
  carbon sequestration 64-8, 69
  carbon storage potential 14, 63-4
  water storage capacity 65
soil degradation 51, 64, 65, 216
soil erosion 14, 51, 53, 64, 108
soil improvement 14, 53, 65, 66-9
soil salinization 51, 70, 108
solar cities 17, 165-6, 180
solar cookers 105
solar energy 15, 50, 79, 80, 81, 87, 88, 95, 96, 105, 107, 118, 137, 163-5, 172, 173, 192-3, 225
solar home systems (SHSs) 104, 117, 118
Solar Renewable Energy Certificates (SRECs) 82
South Africa 34, 103, 104, 211
Spain 80, 81, 84, 151, 164-5, 193, 194-5
Special Drawing Rights (SDRs) 229-30
steam technology 26-7, 28
Stern Report (2006) 9, 45, 55, 81, 109, 156, 169
sulphur dioxide emissions 36, 213
supergrids 15, 93-5, 96
sustainable development 15, 17-18, 102, 119, 168, 169, 179-80
sustainable world, creating a 12, 20, 224-37
Sweden 17, 143
Switzerland 16, 110, 136

Tanzania 112-13
tax revenues 37, 129, 152, 234
technology transfer 9, 114
  enabling factors 111
  financing 111-13
telecommunications 118
Terra Preta 68
The Converging World (TCW) 114-15
thin democracy 230-1
time pressures 20, 233
Transition Movement 18, 197-9
transport fuels 97, 170-1, 212
  see also electric vehicles
transport technologies 108-11, 150
  cities 170-1
  energy-efficient 131-3
  fossil-fuelled powered 26-7, 28-9, 32-3, 34
  goods transportation 30, 133
  long distance travel 133
Transportation Demand Management (TDM) 110

2000-Watt Society 16, 136-7

UK 109, 112
  climate change mitigation 45, 193-4
  energy efficiency 128, 130-1, 151-2
  food production 187, 188
  green-collar economy 145, 153-4
  industrialization 27-9, 30
  nuclear industry 18-19, 211
  regional currencies 197
  renewable energy 84-5, 86, 96, 97, 166-7, 193
  Transition initiatives 18, 198-9
UN Development Programme (UNDP) 112
UN Environment Programme (UNEP) 112, 154
UN Framework Convention on Climate Change (UNFCCC) 36, 58, 113
UN Habitat 169
UN Industrial Development Organization (UNIDO) 112
uranium mining 206-7
urban consumption patterns 178
urbanization 17, 103, 162-3
  fossil-fuel powered 28-31, 37
  mega-urbanization 29-30, 31-2
  21st-century 31
  see also cities
USA
  average per capita energy use 136
  climate change mitigation 38-9, 45
  energy efficiency 127-8, 134, 135-6
  food production 187
  green-collar economy 17, 142, 143, 153, 154-5
  industrialization 30-1
  oil industry 33, 34
  renewable energy 81, 82, 84, 93-4, 151, 180
  urban smart growth planning 171-2

Venezuela 34, 191
volatile organic compounds 36

water pollution 29, 51, 71, 72
water scarcity 11, 17
wealth creation 126
wind energy 79, 80, 81, 84-5, 86, 88, 90, 166-7, 172, 206
  offshore wind farms 84, 95, 167, 170
World Bank 111, 123
World Business Council for Sustainable Development (WBCSD) 125
World Future Council 20, 40, 160, 235