## **Index**

acid rain: 7	best management practices: 31, 264, 265, 330
afforestation: see tree planting	bicycles: 160, 161, 163, 168
African Development Bank: 39, 283, 292, 293	biodiversity: 38,201,204-206,212,213, 217,221,225,253,291
African Development Foundation: 39,287, 293	biomass burning
Agency for International Development	agriculture: 85, 246-248, 250-253, 262
bilateral aid: 34, 35, 37-40, 87,202,229-231,244, 264, 265,	cooking: 38, 85, 86, 127, 128, 250-255, 260
279-282, 284, 286, 287, 289-293	forests: 60,86, 203, 204,248, 250
congressional directives: 34, 39, 229, 274, 281, 282, 292	biomass energy: 13, 77,78, 80,85-89,97,99, 109, 126, 227,
energy-related projects: 34,35,38,39,281,282, 284,291,292	273,287-289,321, 325
"key" countries: <b>39, 282</b>	competitiveness: 28, 86, 103, 201, 202, 214, 227, 325
natural resources projects: 34, 38, 229-232, 282	crops for energy: 27, 28, 85, 86, 89, 201, 202, 206, 214, 215,
Office of Energy: 39 Agricultural Conservation Program: 28, 225-227	227, 319, 325
Agricultural Research Service: 262	emissions: 38, 79, 85, 214, 215, 319 in manufacturing: 182, 188, 190
Agricultural Stabilization and Conservation Service: 28, 35,	traditional fuels: 38,85,86, 127-129,248, 253,260,274,288
201, 223, 225, 226	Bonneville Power Authority: 26, 107
agriculture: see crops, commodity support, food, forests	Brazil: 33,39,68, 78,80, 87, 89,91, 152, 153, 156, 221,223,
agroforestry: 201, 202, 216-219, 230, 231, 257, 290	228, 274,275, 278, 287-289
air-conditioning: 3, 17, 33, 61,63, 116-121, 124, 126, 127, 131,	brominated compounds: 61,62,64
134, 151, 215, 288, 318, 328	buildings
Air Quality Management Plan: 169-171, 329	also see heating, insulation, lighting, shells, windows
albedo: 215	Building Energy Performance Standards: 19, 144
aluminum: see primary metals	CFCs: 115, 119, 126, 127
American Society of Heating,	codes: 14, 16, 19, 115, 119, 120, 124, 135, 137, 139, 140, 330
Refrigeration and Air-Conditioning Engineers: 140	cogeneration: 126, 131-134, 138, 318, 324
America the Beautiful Program: 29, 30, 227	commercial: 115, 118, 122, 128, 131-134, 318, 319, 323-324
Antarctica, Antarctic Ocean: 52,53, 58, 65,72,73	cooking: 116, 124, 127, 128
appliances: 8, 107, 116-119, 121, 124, 125, 128, 130, 132-136,	developing countries: 127, 128
138-142, 302, 314, 315, 318, 323, 324, 330	Eastern Europe: 119, 121, 295
also see regulations	emissions: 7, 8, 58, 115-117, 129-133, 314, 317-319
Applied Energy Services: 218	energy efficiency: 11, 17, 90, 119-134, 137, 323, 324, 330
Asian Development Bank: 36, 283	energy management systems: 119, 124, 125
audits, energy: 14, 17, 20, 25, 107, 141, 192, 195, 196 Australia: 7,81, 82, 150, 300, 304, 305	energy use: 115-133, 135, 140, 274, 300, 301, 313 home energy rating systems: 140, 141
automobiles and trucks	mortgage incentives: 141
also see fuels, transportation, transportation	policies: 134-142
control measures	R&D: 20, 125, 133, 135, 142
Cooperative Automotive Research Program: 171	residential: 115-118, 122, 128-130, 132-134, 301, 318, 323,
Eastern Europe: 150, 154	327
electric vehicles: 159, 160, 164, 171-172	retrofitting: 118-120, 130-134, 136, 330
emissions: 8, 149, 157, 158, 162-164, 314	"smart' homes: 124, 125
energy use: <b>20</b> , <b>150</b> , <b>154-157</b>	U. S. S. R.: 119, 121,295
fuel economy standards: 22, 149, 165-167, 305, 327	Bureau of Land Management: 28, 209, 212,225
fuel efficiency: 11, 17, 21, 149, 153, 154, 157-166,301,318,	buses: 150, 156, 161, 169, 170, 320
319, 324,327, 329	California Energy Commission: 330
fuel prices: 149, 159, 160, 165, 166	Canada: 7,33,81-83,87,117, 150,153,156, 165,187,204,275,
Gas Guzzler Tax: 167	279, 297, 300,301, 304,305
hydrogen vehicles: 160, 172	carbon: see carbon dioxide emissions, taxes; individual fuels,
manufacturers' incentives: 167, 168 O&M: 157, 161, 162, 168,318, 324	sectors, countries cycle: 201, 203, 204
ownership patterns: 150, 152-154	carbon dioxide, atmospheric
rebates: 149, 165-167	concentrations: 45, 54, 56, 58
safety: 159, 171	contribution to radiative forcing: 54-57
size: 21, 149, 157, 159, 161, 162, 166, 167, 319, 324	doubling of: 49,50,52
speed limits: 160-162, 168, 320, 324	global warming potential: 3,55, 56
U. S. S. R.: 150, 154	ice core measurements: 56, 57
vehicle miles travelled: 149, 150, 157, 158, 161-163, 165,	lifetime in atmosphere: 55, 58
168-170, 324	Mauna Loa record: 56,58

stabilization of atmospheric concentrations: 46, 58	sea level: 46, 53, 282
carbon dioxide emissions: <b>3-41</b> , 56-58, 80, 92-110, 116, 117,	seasonality: 47, 57, 58
129-133,149,151, 155-164, 171,177, 181-195,201-223,	snow and ice: 46-49, 52
273, 274, 313-320	solar radiation: 46-48, 51, 52, 65
also see biomass burning, deforestation, emissions;	temperature: 45-53, 57
individual sectors, countries	volcanoes: 47, 51
carbon dioxide sinks: 58, 72, 73, 250	climate convention/protocol: 34, 279
also see emissions (forestry offsets), forestry	clouds: 46, 48-50, 52, 65, 240
carbon sequestration: see emissions (forestry offsets), forestry	CO <sub>2</sub> : see carbon dioxide
carbon tetrachloride: 62, 65, 68	coal
cattle: see livestock, tropical forests	also see electricity (generation)
cement manufacturing: 57, 177, 181	carbon content: 8, 79, 84, 333
centrally -planned economies: see China, Eastern Europe,	
U.S.S.R.	carbon emissions: 8, 57, 58, 77, 79, 81, 86, 92-94, 97, 108
	consumption: 7,8, 77,78,81,82,93, 115, 127,287,295,321
CFCs: see chlorofluorocarbons	efficiency of use: 178, 179
chemical industry	methane emissions: 80, 81, 84, 106, 246
cogeneration:181, 183	production: 82, 183
efficiency: 183, 189	reserves: 81, 82
energy use, emissions: 179-183, 314	trade: 81, 82
waste heat recovery: 183	<b>use</b> in industry: 183, 188, 190
Chemical Manufacturers Association: 63, 127, 252	cogeneration: 11, 12, 17, 23, 25, 88, 104, 126, 131-134, 138,
China: 5,33,39,58,68,78,80-82, 84-87,91,128,150,152, 153,	180-182,184,189-192, 196,260,289,305,318-320, 324
204,219,247,249,252, 253,255,260,261,273-278, 281,	325
287-289, 292, 299	combined-cycle turbines: 26, 92, 93, 95, 108, 109, 323
chlorocarbons: 67	commercial buildings: see buildings
chlorofluorocarbons: 3-5, 30, 61-68, 194, 282, 286, 316	commercial timberland: 28, 29, 208-210, 212, 213, 223
also see Montreal Protocol, ozone	Commission of European Communities: 229,302
air-conditioning: 61, 63, 126, 127, 150, 151, 328	Committee on Renewable Energy Commerce and Trade: 34,35,
atmospheric concentrations: 45, 46, 48, 53, 54, 61-63	37,281,285,286,292,296, 299
consumption: 67, 68, 127, 177, 251, 252	commodity support: 31, 227, 262-265
emissions: 115, 119, 126, 127, 150, 151, 177	Congressional Budget Office: 11,24, 103, 104, 195,322
global <i>Warming</i> potential: 55,56, 62,290	Conservation Compliance Program: 263
insulation: 3, 61, 63, 64, 126, 127, 151, 259	
in transportation: 150, 151	Conservation Reserve Program: 11,27-30, 201,202,206,211,
lifetimes: 55, 61, 62, 66	213,214,216,225,227, 319,325
other uses: 3, 252	Consultative Group on International Agricultural Research: 36,
·	38,231,262,264, 265,294
ozone depletion potential: <b>62-66</b> , 290	conversion factors: 332
radiative forcing: 54-56, 64	cooking: 116, 127, 128, 220
recycling: 127, 151, 259, 327, 328	cookstoves: 217, 220, 260
refrigeration: 61, 63, 126, 127, '243, 245, 251, 252, 259, 260,	Cooperative Automotive Research Program: 23, 171
264	Cooperative for American Relief Everywhere: 230
State initiatives: 327-329	Cooperative Forest Assistance Act: 225
substitutes: 162, 259, 286, 290, 291	Coordinating Committee on Multilateral Export Controls: 37,
Clean Air Act Amendments: 3, 16, 316	286, 298,299
clean coal technologies: 299	Corporate Average Fuel Efficiency: 166
climate and climate change: 3, 45-68	costs of reducing emissions
also see individual gases	OTA estimates: 9-12, 102, 133, 134, 163, 164, 191, 192,208,
albedo: 215	212, 213,215,216, 320-325
"benchmark' warrning: 49	other estimates: 11-12, 24, 103, 104, 195, 322
clouds: 46, 48-50, 52, 65, 240	crops
equilibrium w arming: 48,49, 52-55, 57, 64	also see commodity support, food
factors driving: 46,47,49	annual vs. perennial: 257, 258
feedback processes: 48-53,58, 60	drying: 260,261
general circulation models: 45,46,49-52,224	for energy: 27,28, 85,86,89,201, 202,206,214,215,227,
greenhouse effect: 3,45-53	319,325
historical trends: 47,50,51, 56	yields: 243, 244,250, 253, 256-258, 263
ice ages: 47	Customs and Trade Act: 227
natural variability: 46-48, 50-53	Czechoslovakia: 33,78,82,83,187,275, 294,295,297,299,300
precipitation: 45,47,52	dam construction: 228
predicted changes: 45,46,49,50,224	debt: 32,38,202,228,230,275, 280,287,291,299
radiative forcing (heat trapping): 4, 48-57	debt-for-nature swaps: 230
role of oceans: 45-53, 58, 60, 61, 72, 73	effect on natural resource policies: 32, 202, 228, 275
, , , , ,	on material resource policies. 52, 202, 220, 275

deforestation	forestry policies: 38, 202, 216,228-232
CO <sub>2</sub> emissions: 32, 57, 201, 202, 205, 274, 275	infrastructure: 32, 33, 287
government policies: 32, 38, 202,216, 228, 275, 290, 291	institutional capacities: 37, 230-232, 290, 291
reasons: 32, 38, 202, 216, 220, 221, 228, 275, 287, 291	Montreal Protocol: 67, 68, 252, 274
temperate zone: 32, 201, 204, 246, 275	natural resource policies: 32, 38, 202, 216, 228-232, 291
tropical: .32, 38, 201, 202, 205, 216, 220, 221, 228, 243-245,	population growth: 31-33, 39,40, 274-278, 293-294
275, 287, 290, 291	refrigerators: 128, 252, 253, 264
demand-side management: 18, 24, 107, 115, 137, 138, 194	transportation: 150, 152, 153
Federal Energy Regulatory Commission: 18, 138	development assistance
Northwest Power Planning Commission: 18, 107, 138	multilateral: 36, 38, 39, 219, 279, 283, 291, 292
State policies: 18, 137, 138	percentage of Gross National Product: 34, 281
utility programs: 18, 24, 107, 137, 138, 141, 194	U.S. bilateral: 34,35,37-40,87,202,229-23 1,244,264,265
denitrification: see nitrogen cycle	279, 281,282
Denmark: 7, 78, 82, 276, 300, 302, 305	diesel fuel: 154
Department of Agriculture: 34, 35, 282	doubling time: see carbon dioxide
Agricultural Conservation Program: 28, 225-227	Eastern Europe
Agricultural Research Service: 262	emissions: 5, 273, 274, 295
Agricultural Stabilization and Conservation Service: 28, 35,	energy efficiency efforts: 121, 187, 284
201, 223, 225, 226	energy use: 32, 94, 121, 154, 187, 273-276, 282, 294, 295
commodity support programs: 31, 227, 262-265	environmental problems: 33, 294, 298
Conservation Compliance Program: 263	institutional constraints: 33, 37, 39, 273, 294, 296, 297, 299
Conservation Reserve Program: 11, 27-30, 201,202,206,	joint ventures: 37, 294,295, 297,299, 300
211, 213, 214, 216, 225, 227,319, 325	trade: 34, 37, 281, 286, 295-300
environmental mission: 263	education programs: see information
Forest Service: see U.S. Forest Service:	efficiency, energy: see individual end-uses and sectors
Forest Service: see U.S. Forest Service Low Input/Sustainable Agriculture Program: 265	electricity
Soil Conservation Service: 31, 263-265	also see cogeneration, demand-side management; individual fuels, technologies, and countries
Department of Commerce: 34, 35, 280-282, 285, 286, 299	capacity: 80, 87, 90, 96, 98-100, 289
Department of Energy: 10, 20, 25, 27,34,35,86, 95, 107, 108,	developing countries: 32, 33, 80, 90,91, 94, 116, 127, 128,
110, 135, 138, 140, 184, 281, 292, 299, 328	275,281,287,289
biomass energy: 28, 30, 86, 201, 214, 215, 227	efficiency of use: 92-96, 178, 179, 184-186, 320, 322, 328,
CORECT: 34, 35, 37,281, 285,286,292, 296,299	329
Energy Analysis and Diagnostic Center: 25, 192, 196	electrification: 32, 33, 80, 116, 117, 118, 128, 275, 281, 287
energy audits: 192, 196	289
energy efficiency centers: 37	emissions: 25, 26, 57, 80, 92-94, 96-110, 129, 317
Energy Extension Service: 20, 137, 142, 328	energy sources: 79, 80, 87, 90, 92-94
Energy Information Administration: 10, 12, 149, 313, 314	production technologies: 92-94, 96-99, 115, 190, 289, 323
Federal Energy Management Program: 20, 135, 142	transmission and distribution losses: 84,92,94, 106, 177,281
Institutional Conservation Program: 19, 136, 137, 328	289
Least Cost Utility Planning Program: 138	use: 115, 116, 177-184, 188, 321
Office of Industrial Programs: 25, 192, 196	utilities: 7, 18, 23-27, 99, 106-110, 115, 132, 135, 137, 138,
State Energy Conservation Program: 20, 137, 328	141, 194,218, 319, 320, 327-330
Weatherization Assistance Program: 19, 137, 328	Electric Power Research Institute: 11, 90, 103-105, 107, 322,
Department of Health and Human Services: 137	323, 325
Department of Housing and Urban Development 19, 20, 137,	electrolysis: 177, 178, 181, 183
140-142	emissions, current and historic: 3-8, 25, 56-58, 77-80, \$)2-94,
Department of State: 34, 35, 38,282	115-116, 159, 201-205, 243, 253, 273-275, 295, 296,
Department of Transportation: 23, 171	313-315
Department of Treasury: 34, 35, 39, 229, 280, 282, 293	also see individual sectors and countries
developing countries:	emissions, projected: 4-7, 149, 295, 296, 301, 302
also see deforestation, livestock, population, tropical forests;	forestry offsets: 5,9, 11,27-30,202,206,208-211, 213,223,
individual sectors, fuels	316, 319,320
agriculture: 38, 243-245, 247-250, 253, 255-258, 260, 262,	OTA model: 4-6,8-11, 17, 18,21,23-28,94-102, 117,
264	129-133, 160-163, 188-191, 315-320
buildings: 115, 116, 127, 128	Endangered Species Act: 212
CFCs: 288	energy use: 3,7,8,20, 77, 115-127, 150, 154-157, 177-185, 194,
development needs: 31-34, 81, 128, 202,230,287	195, 201,273-275, 294-296,300, 301, 313, 314
electrification: 32, 33, 116, 128, 275, 281, 287, 289	also see emissions; individual countries, fuels, sectors,
energy policies: 38, 39, 289-292 energy use: 7, 31-33, 78, 81, 84-86, 106, 115, 127, 128, 202,	technologies efficiency centers: 37, 286, 299, 300
273-275, 287, 288	intensity: 117, 178-184, 189-191, 193, 301
· · - · - · - · · - · · ·	

management systems: 118, 185	195, 201
per-capita: 3,31-33, 115, 11'7, 127,274, 275,287,295	marketable permits: 13, 14, 16, 24, 26, 103, 104, 108, 109,
prices: 6, 10, 12, 21,81, 102-104, 108, 109, 129, 136, 149,	193, 194
160,165,166,178,179, 183,195,301,313,320-324, 325	taxes: see taxes
rating systems: 140, 141	tied-aid financing: 37, 281, 286
research needs: 105, 106, 109, 110	fires: 204,248
supply: 77-110	also see biomass
taxes: see taxes	fluidized bed combustion: 92, 97
Energy Analysis and Diagnostic Center: 25, 192, 196	fluorescent bulbs: 17, 18, 119, 121, 130, 186,319
Energy Extension Service: 20, 137, 142, 328	food (and agriculture)
Energy Information Administration: 10, 12, 149, 313,314	also see crops, Department of Agriculture, fertilizers,
energy investment tax credit: 25, 195	livestock, methane, rice
Energy Sector Management Assistance Program: 38, 283, 291,	CFCs: 30, 243,245, 251, 252, 259-261
292 Energy Tay Act, 22 25 167	commodity support: 31, 262-265 consumption: 244, 245, 259
Energy Tax Act: 22,25, 167	cooking: 30, 243-245, 250-254, 260, 270
environmental assessments: 36, 38, 228-230, 283, 291 Environmental Protection Agency: 4,5, 11,34, 35,50,59,65,	developing countries: 38, 243-245, 247-250, 253,255-258,
67, 104,232,280-282, <b>292</b> , 299,300,322	260, 262,264
emissions projections: 246, 314, 301, 322	emissions: 30, 38, 243-253
energy efficiency centers: 37, 286, 299	energy use: 181, 243, 244, 246, 250-253, 259-261, 266, 270
ethanol: 89, 159, 160, 164, 261	ethanol fuels: 261
Europe: see Eastern Europe, European Community, OECD	forest clearing for agriculture: 30, 243-245,250, 257
European Bank for Reconstruction and Development: 300	grains and subsidies: 245, 262,263
European Community: 301-303	irrigation: 30, 107, 244, 245, 251, 256, 258, 261
emission projections: 301, 302	land use changes: 30,243, 244,257,258, 265
greenhouse gas policies: 302	machinery: 30, 243, 244, 250, 260, 261, 266
European Economic Commission: 284	methane: 30, 38, 243, 245-249, 253-256
Export Administration Act: 37, '286, 298, 299	nitrous oxide: 30, 243, 248-250, 255, 261
Export Control Act: 298	post-harvest activities: 247-244,251-253, 270
Export Facilitation Act: 299	processing and packaging: 244, 251-253, 259,260
Export-Import Bank (Eximbank): 34,35,37,280,281,285, 286,	production: 243-252,258, 270
296, 299,300	research needs: 31, 247, 256-258, 262, 265
exports: see trade	soil erosion: 201, 205, 243, 250, 253, 255, 258, 261
extractive reserves: 221 family plarming: 38-40,202, 228, 230, 277, 282, 293, 294	sustainable agriculture: 38, 202, 244 tillage practices: 253, 256, 258, 261
also see population	wastes flosses: 251, 253, 258, 259, 266
Farm Bill: see Food Agriculture, Conservation, and Trade Act	Food Agriculture, Conservation, and Trade Act: 28-30,226,
farms: see crops, food	227, 243,263, 265
Federal Energy Management Program: 20, 135, 142	Food and Agriculture Organization: 36, 259,265
Federal Energy Regulatory Commission: 18, 27, 108, 138	Food Security Act: 30, 214, 243, 263
Federal Highway Administration: 156, 158	Foreign Assistance Act: 39, 229,293
Federal Home Loan Mortgage Corporation: 141	Foreign Credit Insurance Corp.: 286
Federal Housing Administration 141	Foreign Operations Appropriations Act: 34, 39, 274, 281,282,
Federal National Mortgage Association: 141	285
feedback, climate: 48-53, 58,60	Forest and Rangeland Renewable Resources Planning Act: 28,
feedstocks, fossil fuel: 8, 86, 181, 183, 314	212, 224
fertilization	forestry: see forests
also see crops, fertilizers, food	Forestry Incentives Program: 28,225-227
CO <sub>2</sub> fertilization of plants: 58, 224	forests and forestry
fertilizing oceans with iron: 58,72, 73 fertilizers: 3, 244-246,248-251	also see deforestation, tree planting, tropical forests, U.S. Forest Service
also see commodity support, crops, nitrogen cycle, nitrous	biomass energy: 11, 13,27,28,30
oxide	commercial timberland, U. S.: 28, 29, 208-210, 212, 213, 223
application: 31, 60, 207, 249, 250, 256-258, 263, 330	effects of climate change: 210, 223, 228
consumption: 245, 256, 265	efficiency of end use: 211, 213
forest management: 207, 211,212, 214, 225	emissions, offsets: 5, 9, 11, 27-30, 201-223, 316, 319, 320
manufacturing: 30,31,207,214,243,250, 251,260,262,270	fires: 204, 224
Minnesota Nitrogen Fertilizer Task Force: 330	increased productivity: 11, 13, 27-29,202,206-210,223, 319,
nitrogen: 245, 246, 248, 249, 256, 257	320, 325
inancial mechanisms	log exports: 213, 227
bundling: 39, 293	"new forestry" 210, 213, 225
incentives: 7, 13-16, 19, 20, 103, 104, 107, 149, 165-167, 194,	old-growth: 210-217

1: : 202 205 222	110 122 124 120 121 122 120 120 210 220
policies: 223, 225-232	118, 122, 124, 130, 131, 133, 138, 139, 318, 329
restrictions on harvesting: 210-213	heat island effect: 45, 50, 124, 215
timber industry, U. S.: 209-213	heat pumps: 117, 130, 131
fossil fuels: 81-86	heat recovery: 25, 186, 196
see also coal, emissions, natural gas, petroleum, taxes	High Occupancy Vehicle lanes: 22, 155, 168, 170, 329
emissions: 3, 5-8, 56-58, 77-80, 86, 92-94	Home Energy Rating Systems: 140, 141
prices: see energy use (prices)	Hood River Conservation Project: 142
use: 177, 182, 188, 189, 250, 251, 270, 274, 275	Housing and Community Development Act: 137
France: 7,33,78,82,83,91, 117, 131, 153, 165,275,278,279,	hydrochlorofluorocarbons: 55,56,62-64,68, 127, 151, 290
297, 300, 301, 303, 304	global Warming potential: 55,56, 62-64, 290
freight travel: see travel	ozone depletion potential: 62-64, 290
fuel cell: 26, 27, 92,93, 105, 109, 171	hydroelectric power: 7, 11, 13, 25, 39, 77, 78, 80, 87,97-100,
fuels	107, 109, 184, 287, 289,291, 295, 303, 319, 322
also see energy, ethanol, gasoline, methanol, renewable	hydrofluorocarbons: 55, 56,63,64, 290
	ice ages: 47
energy	
alternative fuels: 23, 89, 149, 159, 160, 164, 170, 261, 305,	incandescent bulbs: see lighting
327, 330	India: 33,39,68,78,80-82,86, 87,90,91,94,152, 153,222,245
economy standards: 149, 165-167	252, 260,261,274-276,278, 284, 287-289
traditional: 38, 85, 86, 127-129, 248, 253, 260	Indonesia: 33,39,68,83,87, 153,221,222,232,274, 275,278
fuel switching: 11, 12, 17, 24, 77, 84, 92-94, 96-99, 104, 108,	286, 288
119, 128,129,134,177, 189,191-194,260,261, 289,290,	industry: see manufacturing
305, 319, 325	Industry Cooperative for Ozone Layer Protection: 286
fuelwood	information programs: 13-15, 17,20,25, 115, 135, 140-142,286
contribution to deforestation: 220	302, 303,305, 327
cookstoves: 217, 220, 260	audits: 14, 17, 20, 25, 107, 115, 141, 192, 195, 302, 303, 305
gasoline	Home Energy Rating System: 20, 140, 141
mileage standards: 149, 166-167	labels: 14, 17, 141, 142, 302,303
prices: 6, 21, 149, 160, 165-167	Institutional Conservation Program: 19, 136, 137,328
tax: 165-167	insulation: 11, 17, 18, 61, 63, 118-121, 123, 127, 318, 327
Gas Research Institute: 10, 94,99, 105, 129, 190, 313, 314	Insurance Institute for Highway Safety: 159
gas turbine: 25, 92, 93, 103, 320	integrated gasification combined cycle: 26,92,93, 95, 108, 323
General Agreement on Trade and Tariffs: 22, 167, 299	Inter-American Development Bank: 36, 38, 39, 280, 283,291,
general circulation models: 45,46,49-52, 224	293
geothermal power: 18,39, 77,80,87,97,105,138, 273,281,292	Inter-American Foundation: 39, 286,287,293
Germany: 7,33,68,78,82-84,91, 117, 153, 165,259,275,276,	Inter-American Institute for Cooperation on Agriculture: 262
278, 279,292, 294, 297, 300-305	intercity rail: 21, 161, 163, 164, 170, 320, 324
Global Environmental Facility: 38, 291	intercooled steam-injected gas turbines: 17, 92, 93, 189, 191,
Global Releaf Program: 228	325
global warming: see climate	Intergovernmental Panel on Climate Change: 4, 5, 36,4547,
global warming potential: see individual gases	282-284, 298
grains: see food	findings: 45-47, 50,51, 53, 55,58,60, 61,66, 67, 249
Green Fund: 291, 293	structure, working groups: 36, 283, 284, 298
greenhouse effect: 3,45-53	Interior and Related Agencies Appropriations Act: 28,30, 226
also see climate	227
greenhouse gases: 3,45-68	Internal Revenue Service: 230
also see climate, emissions; individual gases	International Board for Soil Research and Development: 262
Gross Domestic Product: 152,245, 302	International Council for Research in Agroforestry: 231, 262
Gross National Product: 6, 10,11,31,34,35.103, 104, 178-180,	International Council of Scientific Unions: 36, 284
281, 291, 301, 313, 321	International Development and Finance Act: 228, 230, 287
groundwater contamination: 7, 207, 243, 263	International Energy Agency: 284, 301, 302
Group of 7: 279, 301	International Environmental Bureau: 286
Guanacaste National Park: 223	International Fertilizer Development Center: 262
halons: 3, 45, 61, 62, 65, 66, 68, 126, 288, 328, 329	International Fund for Agricultural Development: 36, 284
also see Montreal Protocol	International Laboratory for Research on Animal Diseases: 264
fire extinguishers: 61, 127, 328	International Livestock Centre for Africa: 264
global warming potential: 62	International Monetary Fund: 283, 287, 300
ozone depletion potential: 62, 65	international Planned Parenthood Federation: 40,230, 293,294
harvesting of timber: see forests	International Tropical Timber Organization: 36, 38, 203, 229,
heating: 3, 17, 117, 118, 120-122, 124, 130, 131, 133, 138, 181,	231, 232, 284
185, 188, 192, 196, 323, 324	ionophores: 255, 262
also see space conditioning	irrigation: 30, 244, 245, 256, 258
heating, ventilation, air-conditioning equipment: 8, 11, 17, 19,	energy use: 251

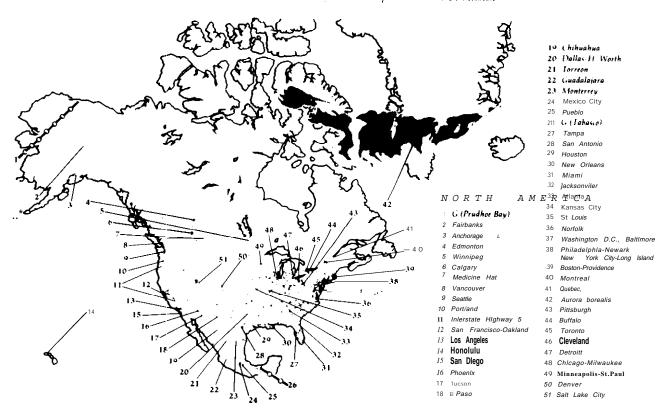
```
technologies to reduce: 261
                                                                       policies: 192-196
                                                                       process heat: 8, 180, 181, 183, 185, 188,314,325
 Italy: 7,33,82,83,87, 117, 153,247,275,278,279, 297, 300,
       301, 303, 304
                                                                       product and process changes: 17,23, 186, 187,189-192,319
                                                                       recycling: 182-186
Jackson-Vanik Amendment: 2'98-300
                                                                       research: 25, 185
Japan: 7,20,21, 23,25, 33, 35, 36,78,80-85,87, 91,97, 108,
                                                                       "second-tier" industries: 179, 181, 185
       117, 125, 150, 153, 156,213,227, 229, 247,275,278,
                                                                       space heat: 181, 185, 188, 192, 196
       279, 292, 295, 297, 300, 301, 304, 305
                                                                       structural changes: 177, 178, 192, 301
joint ventures: see trade
                                                                       U.S.S.R: 187,295, 2%
labels: 232
                                                                       variable-speed drives: 186
landfills: 59, 60, 86, 88, 211, 246, 253
                                                                     manure: see livestock
land tenure, reform: 32, 38, 202, 216, 218, 228, 230, 275
                                                                    marketable permits: 13, 14, 16, 24, 26, 103, 104, 108, 109, 193,
land use changes: see deforestation, urbanization
                                                                           194
land-use planning: 22, 155-157, 169-171, 265, 305
                                                                       also see financial mechanisms
least-cost utility planning: 137, 138, 194, 292,327,328
                                                                    mass transit: 11, 17, 21, 22, 149, 155-157, 161, 163, 164, 169,
legumes: 218,249, 250, 257
                                                                           170, 318-320,324
lifecycle cost: 15, 17, 134, 136, 139, 159
                                                                    Mauna Loa CO<sub>2</sub> record: 56, 58
lighting
  also see regulations (appliance standards)
                                                                      also see landfills, livestock, natural gas
  automatic controls: 119-121, 186
                                                                       atmospheric concentrations: 45, 46, 54, 58-60
  energy efficiency: 11, 17, 118-121, 124, 128, 131-134, 185,
                                                                      control methods: 31,86,88, 106,211,220,253-256, 262-264
       186, 189-192, 196, 318
                                                                      emissions, sources: 3, 5, 30, 38,45, 48, 59, 60, 79, 80, 84-86,
  energy use, emissions: 3, 115-117, 119, 181, 185, 186, 314,
                                                                           88, 106,203,207,211,220, 243,245-249,253,282, 285,
       318, 319
                                                                           287-289, 316
  fluorescent bulbs: 17, 18, 119, 121, 130, 186, 319
                                                                      global Warming potential: 55,56
livestock: 31, 38,59,60, 220, 248, 261, 262, 287, 288
  also see methane, tropical forests
                                                                      lifetime in atmosphere: 55,59
                                                                      methane-hydrates: 60
  and grain subsidies: 263
                                                                      radiative forcing: 54-56, 59
  developing countries: 220,244,245,253,255, 256,264,287,
                                                                    methanol: 89, 159, 160, 164
      288
  manure: 31, 243, 247, 255, 262
                                                                    methyl chloroform: 62, 65, 68, 151
  productivity enhancements: 31, 243, 244, 253, 264
                                                                      also see Montreal Protocol
  reduced demand for: 31, 243, 255, 256, 264
                                                                    Mexico: 33,39,68,82-84,87,91, 153,274,275,277,278, 288,
  ruminants: 31, 246, 247, 253
  United States: 31, 245,255, 262, 263
                                                                    microorganisms: 203, 207, 248, 249
loans, low-interest: 14-16,24, 194
                                                                    model, OTA
logging: see deforestation, forests
                                                                      also see costs
                                                                      Base case: 5,6, 8,9, 12, 17, 21, 22, 25, 26, 94-102, 117,
Los Angeles
  Air Quality Management Plan: 169-171, 329
                                                                           129-133, 160-163, 188-190, 313-320
  traffic: 157, 158, 168
                                                                      basic structure: 10, 313
Low Income Home Energy Assistance Program: 19, 137
                                                                      buildings: 129-134
magnetohydrodynarnics
                                                                      energy supply: 94-102
manufacturing
                                                                      manufacturing: 187-192
  automatic controls: 185, 186
                                                                      Moderate: 5,6,8-11, 17,21-25,94-102, 115, 117, 129-133,
  boilers: 180, 181, 185, 189-192,325
                                                                          160-163, 188-190, 313,315-320
  CFCs: 177
                                                                      Tough: 5,6,8-12, 17, 21-26,94-102, 115, 117, 129-134,
  cogeneration:11, 17,23,25, 180-184, 189-192, 196,319,320,
                                                                          161-163, 188-191, 313, 315-320
      325
                                                                      transportation: 160-164
  Eastern Europe: 187,295
                                                                   monoculture: 210, 263
  efficiency: 11, 177-192
                                                                   Montreal Protocol: 3,5, 16,45, 64,66-68, 127, 151,252, 264,
  electrolysis: 177, 178, 181, 183, 314
                                                                          274, 305,316
  emissions: 7,8,58, 177, 181-184, 187-195,314,317,319, 320
                                                                      1990 revisions: 5,45,64,68
  energy in imports: 178-180, 193
                                                                      and Clean Air Act Amendments: 16, 68, 316
  energy use: 177-186, 188, 190-193, 274, 300, 313, 320
                                                                      developing countries: 67, 68,252, 274
  fuel switching: 11, 17, 177, 189, 191-194, 319, 325
                                                                      initial agreement: 67
  heat recovery: 25, 186, 196
                                                                      Multilateral Fund: 68
  housekeeping: 11, 17, 185, 18'9-192, 319, 325
                                                                   Most Favored Nation: see trade
 intercooled steam-injected gas turbines: 17, 189, 191, 325
                                                                   motors, electric: 23, 24, 107, 186, 189-192, 194, 314, 319, 320,
 lighting: 181, 185, 186, 188-192, 196,319
 major industries: see chemical, paper, petroleum, primary
                                                                   Multi-Agency Working Group for Power Sector Innovation:
     metals
 mechanical drive: 8, 181, 183, 185, 188, 192
                                                                   multilateral development banks: 35, 36, 38, 39, 228, 229, 280,
 motors: 11, 17, 23, 24, 186, 189-192, 194, 314, 319, 320, 325
                                                                          283
```

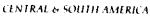
African Development Bank: 36, 39, 283,292	214,225,243,245,246, 249,250,256,257,261-263, 316
Asian Development Bank: 36, 283	global warming potential: 55,56, 60
development assistance: 36, 38, 39,229,283, 291, 292	lifetime in atmosphere: 55, 61
environmental assessments: 36, 38, 228, 229, 283, 291	vitrification inhibitors: 256, 257
Inter-American Development Bank: 36,38,39,280,282,291,	radiative forcing: 54-56, 60
292	non-governmental organizations: 35, 37, 230-232, 280, 286,
role in deforestation: 38, 228, 283	287. 294
U.S. Executive Directors: 35, 228-230, 282,287,291, 296	, -
	nontimber products: 38, 201, 202, 204, 217, 220, 221, 231
World Bank: see World Bank	Northwest Power Planning Commission: 18, 107, 138,323,330
Multilateral Fund: 68	Norway: 7, 35, 83, 300, 304, 305
Multiple-Use and Sustained-Yield Act: 28, 212, 225	nuclear power
municipal solid waste: 86, 88, 211, 329	electricity generation: 7, 11, 25,26, 77,78, 80,91,92,97,98,
methane from landfills: 88, 211, 253	100, 108, 109, 289
paper recycling: 211	emissions: 80, 91
national accounting procedures: 230, 291	Europe: 91, 108
natural resource values: 291	improved utilization: 25, 27, 97, 98, 100, 107, 108, 319, 320,
U.N. Statistical Commission: 291	322
National Advisory Council for Environmental Policy and	
	light water reactor: 13, 110
Technology: 281	modular high temperature gas reactor: 109, 110
National Affordable Housing Act: 19,20, 140-142	opposition: 13, 91, 295
National Appliance Energy Conservation Amendments: 19,	proliferation: 91, 92,289
124, 125, 129, 138, 139	U. S. S. R.: 295
National Council of States Building Codes Standards: 139	waste: 92, 105
National Energy Act: 195	Nuclear Regulatory Commission: 27, 108
National Energy Policy and Conservation Act: 141	Oak Ridge National Laboratory: 10, 25, 105, 160, 196, 313
National Forest Management Act: 28, 212, 225	oceans
National Forests: 28, 29, 208, 226	effects on global climate: 45-53, 58, 60, 61, 72, 73
National Highway Traffic Safety Administration: 159	fertilization with iron: 58,72, 73
National Housing Act: 19, 140	role in carbon cycle: 45, 58, 72, 73
National Institute for Science and Technology: 139, 140	Office of Industrial Programs: 25, 192, 196
National Research Council: 72	Official Development Assistance: 35
National Science Foundation: 262	see Agency for International Development, multilateral
natural gas	development banks
also see electricity (generation)	offsets, carbon: see emissions, forestry
carbon content: 8, 79, 333	oil: see petroleum
carbon emissions: 8, 77, 79, 84, 85, 92-94, 108	old-growth forests: 214-217
co-firing: 11, 25, 26,57,58, 93,94,97-99, 101, 102, 108, 319,	Organization for Economic Cooperation and Development: 37,
320, 323	-
· · · · · · · · · · · · · · · · · · ·	152, 153, 187, 276, 284, 291
consumption: 7, 8, 77, 78, 81, 83, 84, 93, 99, 115, 127, 159,	emissions: 5, 273, 274, 301, 302
160, 179, 183, 185, 188, 190,289, 295, 321	energy efficiency programs: 117, 119, 302, 303
efficiency of use: 85, 178, 179	energy use: 32, 85, 115-118, 273-275, 287, 300, 301
methane emissions: 59, 80, 84, 85, 94, 104, 106, 159, 246,	European Community: 301-303
281, 288, 289	greenhouse gas policies: 7, 302-305
production: 30, 81, 83, 84, 181	member countries: 115, 273, 300
reserves: 81, 83	OTA model: see costs, scenarios
trade: 81, 83, 84	Overseas Private Investment Corp.: 34,35,221,280,281,285,
transmission and distribution: 30, 45, 84, 94, 159	291, 296,299, 300
Natural Resources Defense Council: 226	
	Environmental Investment Fund: 285, 300
Netherlands: 7, 33, 82, 83,95, 300, 302-304	ozone, stratospheric
New York Public Service Commission: 137	depletion: 3,4,7,48,61, 64-67, 127, 252
New Zealand: 7, 87, 300, 304,305	also see chlorofluorocarbons, halons, Montreal Protocol
vitrification: see nitrogen cycle	ozone, tropospheric: 249
nitrogen cycle: 248, 250, 256	Pacific Northwest Electric Power Planning and Conservation
also see fertilizers, food	Act: 138
denitrification: 248, 249, 256	Pan-American Development Foundation: 231
legumes: 249, 250, 257	paper industry
vitrification: 248, 249, 256	cogeneration: 181, 182
role of microorganisms: 60, 248, 249	,
nitrous oxide	efficiency: 182, 189
	energy use, emissions: 179, 182,315
also see fertilizers, food	recycling: 182, 183
atmospheric concentrations: 45, 46, 54, 60	parking: 11,22,149, 155, 156,160-162,164, 168-170,318,324,
emissions, sources: 3, 5, 30, 31, 48, 60, 203, 207, 211, 212,	329

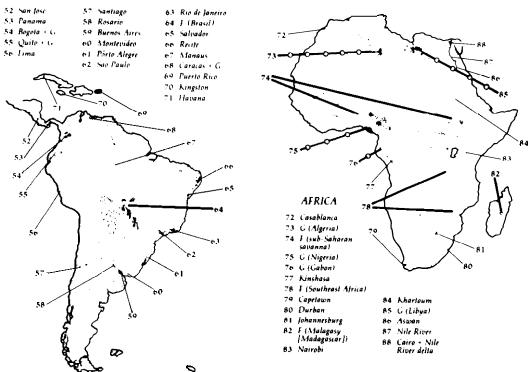
particulate: 115	recycling
passenger travel: see travel	al <b>uminum</b> : 184-186
permits: see marketable permits, regulations	paper: 182, 183,211
petroleum	steel: 184, 185
carbon content: 8, 79, 333	water: 261
cogeneration: 181	refining: 179-183, 189, 314, 315
consumption: 7, 15, 77,78,81,82,84,85, 115, 127,295,301, 321	reforestation: see tree planting refrigeration
efficiency of use: 85, 178, 179, 183, 189	alternative working fluids: 259, 290
emissions: 8, 57, 58, 77, 79, 80, 84	CFCs: 61,63, 115, 126, 127, 243,245, 251,259, 260,264,
Petroleum Overcharge Fund: 136, 328-330	288,328
production: 15,81, 82,85, 183	CO <sub>2</sub> emissions: 115,243, 251,252,259, 314
refining industry: 179-183, 189, 314, 315	in developed countries: 252, 264
reserves: 81, 82, 85	in developing countries: 33, 128, 252, 253, 264, 288
trade: 81, 82, 85	use of electricity: 252, 259, 260, 270
photosynthesis: 56,58,85,203,224	regulations: 12-14, 16, 18, 19, 24, 183
photovoltaics: 91, 105,281, 289, 290	appliance standards: 16, 19, 115, 124,125, 135, 138, 139,302,
phytoplankton: 47	305
fertilizing with iron: 72,73	building codes: 14, 16, 19, 115, 119, 120, 124, 135, 137, 139,
pipeline leaks: 80, 84, 106, 281, 289	140, 303,305, 330
plantations: 201, 222	emissions standards: 26, 27, 108, 109, 194, 305, 319
Poland: 33,39,68,78,82,83, 275, 278,294,295,297,299, 300	fuel economy standards: 22, 149, 165-167,305
polar ice sheets: 46	performance standards: 14, 16
population	renewable energy: 4, 5, 12, 13, 25, 26, 77, 80, 87-92, 97-102,
age structure: 277	105, 109, 117, 126, 202,260,273, 281,285, 289,292,
country, city rankings: 278, 279	305,327-329
family planning programs: 38-40, 202, 228, 230,277, 282,	also see individual sources, technologies
293, 294	R&D funding: 6, 16,27, 105, 110,302
global: 31-33,40, 278,293, 294	trade, technology transfer: 281,285,286,292,299, 300
growth, projections: 31-33,39,40,274-278, 294	Renewable Energy Design Assistance Center: 285,286
International Planned Parenthood Federation: 40, 293, 294	Renewable Resources Extension Act: 225
momentum: 276, 277	research and development: 3,6,7, 13-16,27, 115, 120, 142, 196,
policies: 40,202, 293,294	214,280,286,302, 303
UN Population Fund: 36,40,230,284, 293, 294	residences: see buildings
urbanization: 115, 128, 155, 250, 265, 277-279	Residential Conservation Service: 20, 137, 141
U.S. funding: 40,282, 293, 294	retrofitting: 11, 17, 118-120, 130-134, 136, 189, 192, 330
world population conference: 39, 293	rice
potential global warming: see individual gases	also see methane
powerplant retirement: 98-102, 110	methane emissions: 59, 60, 245-247, 256, 262, 287, 288
precipitation: 45,47,52	production: 246, 247, 256
prices, energy: see energy, gasoline	yields: 256
primary metals	ridesharing: 11, 22, 149, 155, 161, 162, 164, 168, 170, 324, 329
aluminum: 180, 181, 184-186	rubber tapping: 221
cogeneration: 181	ruminants: see livestock
energy use, emissions: 179-180, 182, 184, 185, 189, 314	safety issues: 159, 171
recycling: 185, 186	scenarios, OTA model: see model
steel: 180, 181, 184, 187	scrubbers: 77, 92, 93, 95
Private Export Funding Corp.: 285	sea level: 46, 53, 282
process heat: 180, 181, 183, <b>185</b> , 188	seasonality: 47, 57, 58
productivity, increasing	sequestration, carbon: see emissions (forestry offsets), forestry
livestock: 31, 243,244,253, 264	shells, building: 11, 17, 18, 118, 130-134, 137, 142, 318, 323
timber: 11, 13, 27-29, 202, 206-210, 223, 319, 320, 325	Shelterbelt Program: 213
Program for the Acceleration of Commercial Energy Research:	shifting cultivation: 202, 216, 217, 219, 275
285	short-rotation woody crops: 27, 28, 85, 86, 89
proliferation, nuclear: 91,92, 289	"smart" house: 124, 125
Public Utility Commissions: 27., 107, 108, 137, 138	snow: 46-49, 52
Public Utility Regulatory Policies Act: 18, 138	Soil Bank: 214
adiation	Soil Conservation Service: 31, 225, 263-265
solar radiation: 46-48, 51, 52, 65	soil erosion: 201, 205, 207, 211, 225, 243, 250, 253, 255, 258,
ultraviolet: 65 adiative forcing: 4, 48-57, 59, 60, 64	261 solar aparayı 5.6. 11. 19. 30. 77. 90.97.00.07. 122. 126. 129.
ebates: 20-22, 24, 149, 165-167, 194	solar energy: 5,6, 11, 18, 39, 77, 80,87,90,97, 122, 126, 138,
Coacos. 20-22, 24, 147, 105-107, 174	261,273,289,292

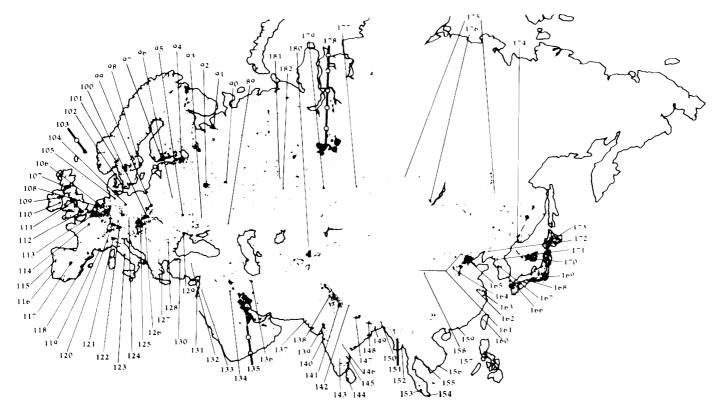
electricity: 27, 90, 105	Most Favored Nation status: 37,299
photovoltaics: 91, 105,281,289,290	Omnibus Trade and Competitiveness Act: 298
Solar Energy and Energy Conservation Bank: 137	Overseas Private Investment Corp.: 34,35,221, 280,281,
Solar Energy Research Institute: 105, 109, 110, 126	285, 291, 296,299, 300
solid waste disposal: 86, 88, 253, 329	percent of GNP: 301
South Coast Air Quality Management Plan: 169-171,329	renewable energy: 34, 281, 285, 286, 292, 299, 300
Soviet Union: see U.S.S.R.	Support for Eastern European Democracy Act: 286,299
space conditioning: 8,85, 115-118, 120-122, 124, 139, 181, 185,	tied-aid financing: 37, 281, 286
188, 192, 196	trade restrictions: 37, 213, 227, 228, 232, 298-300
also see air-conditioning, heating	tropical timber: 38, 221, 228, 232
spotted owl: 212, 213	US/ECRE: 280, 286, 287, 291, 296
standards: 7, 14, 16, 18, 19, 22, 24-27, 108, 109, 115, 119, 120,	U.S. Trade Development Program: 34, 35, 285, 296.299
124, 135, 137-140, 149, 165-167, 194,302,303,305,319	with developing countries: 34, 38, 281, 285, 286
also see regulations	with Eastern Europe, U. S. S. R.: 34, 37, 187, 281, 286, 294
State activities: 142, 327-330	Trade Act: 298
Public Utility Commissions: 27, 107, 108, 137, 138,329	traffic flow: 11, 17, 22, 155, 164, 169, 170, 318
State and private forestry: 28-30,225-227	transmission and distribution: see electricity
State Energy Conservation Program: 20, 137, 328	transportation
steel: see primary metals	also see automobiles, fuels, transportation control measures
storms: 46	aircraft: 159, 161-163
stratosphere: see ozone	bicycling: 156, 161, 163, 168
structural changes: 6, 177, 178, 192	buses: 150, 156, 161, 169, 170, 320
subsidies: 26, 38	CFCs: 150, 151
see commodity support; individual fuels and sectors	congestion: 156-158, 168-171
Support for Eastern European Democracy Act: 286,299	Eastern Europe: 295
Surgeon General: 255	emissions: 7, 8, 20, 57, 149-151, 155-164, 171, 314, 315, 317
sustainable agriculture: 38, 202, 244	energy use: 20, 150, 154-157, 274, 301, 313
Sweden: 7, 20, 78, 117, 119, 120, 124, 300, 304,305	intercity rail: 21, 161, 163, 164, 170, 320, 324
taxes	land use plarming: 155-157, 169-171
capital gains: 29, 226	O&M: 22, 161, 162, 164, 168, 318, 324
carbon: 11, 14-16, 18,24,26,85, 103, 104, 108, 109, 194, 195,	rebates: 149, 165-167
304, 305	R&D: 23, 149, 165, 170-172
energy-use: 3, 7, 14, 15, 26, 103, 104, 115, 135, 136, 195	taxes: see taxes
fuel taxes: 21, 28, 85, 149, 165, 166, 201	travel: see travel
Gas Guzzler: 21, 136, 167	U. S. S. R.: 295
initial purchase: 14, 15, 19, 20, 22, 115, 135, 136	vehicle miles traveled: 149, 150, 154, 155, 157, 158, 160-163,
tax credits: 19, 24, 25, 29, 136, 195, 227, 230, 328, 329	168-170
tax incentives: 14, 15, 29, 30, 103, 104, 136, 195, 201,	transportation control measures: 22,23, 158, 168-170,305,327,
226-228	329
Tax Reform Act: 19, 136, 226	bicycling: 168, 170
technology transfer: see trade	High Occupancy Vehicle lanes: 22, 155, 168, 170, 329
telecommuting: 22, 149, 169, 170	mass transit: 11, 17,21,22, 149, 155-157, 161, 163, 164, 169,
temperate zone forests: 201-216, 275	170, 318, 319, 320, 324
also see forests	parking management: 11,22, 149, 155, 156, 160-162, 164,
temperatures: 45-53	168-170,318, 324, 329
Tennessee Valley Authority: 26, 107, 138	ridesharing, vanpools: 11, 22, 149, 155, 161, 162, 164, 168,
termites: 60, 246	170, 324,329
thermo-mechanical pulping: 182	telecommuting: 22, 149, 169, 170, 327, 329
till age practices: see food	trafficflow: 11, 17, 22, 155, 164, 169, 170, 318, 319, 324
timber: see forests	travel
trade: 35, 37, 178-180, 281, 285-287	air: 149, 150, 152, 154, 159, 315
bundling: 39,293	freight: 149, 152-154, 159,315
COCOM: 37, 286, 298, 299	marine: 149, 152-154, 315
CORECT: 34,35, 37,281, 285,286, 292,296,299	passenger: 149, 150, 152, 154
Export Administration Act: 37, 286, 298, 299	rail: 149, 152-154, 315
Export Control Act: 298	tree planting, U.S.
Export Facilitation Act: 299	also see forests
Export-Import Bank: 34,35,37,280,281,285, 286,296,299,	afforestation: 11, 27-29, 194, 202, 206, 211, 213, 214, 215,
300	227, 319, 320,325, 327, 330
General Agreement on Trade and Tariffs: 22, 167,299	America the Beautiful Program: 29, 30, 227
Jackson-Vanik Amendment: 298-300	CO <sub>2</sub> offset, sequestration: 201,202, 205-209,211-216,223,
joint ventures: 37, 294,297, 299,300	319
J	

Conservation Reserve Program: 11,27-30, 201,202,206,	<b>State</b> and private forestry: 28-30,225-227
211, 213,214,216, <b>225</b> , 227,319, 325	tropical research centers: 225, 231
Global <b>Releaf</b> Program: 228	U.S. Geological Survey: 87
reforestation: 28, 38, 194, 201, 202, 210, 226, 305	U.S. Trade and Development Program: 34,35, 285,296, 299
Shelterbelt Program: 213	U.S. Trade Representative: 34, 35, 87,282,299
Soil Bank: 214	U. S. S. R.: 5, 34, 36,68, 81-84,87, 91,94, 119, 121, 127, 150,
urban trees: 11,27,29,30, 201, 202,206,215,216,227, 228,	152, 153, 187,204, 273-276, 282, 284, 298
319, 320, 325	also see individual sectors
tropical forests	emissions: 5, 32, 33, 58, 273, 274, 296
also see cookstoves, deforestation, forests, shifting	energy efficiency efforts: 121, 187, 296
cultivation, trade	energy use: 32, 33, 121, 154, 187, 273-276, 294-296
agroforestry: 201, 202, 216-219, 221, 230, 231, 290	environmental problems: 33, 294, 298
cattle ranching: 32, 38, 202, 217, 220, 228, 244, 264, 275	institutional constraints: 33, 294, 294, 296-299
commercial logging: 38, 202, 217, 221, 222, 231, 232, 290,	joint ventures: 37,294,297,299-300
291	trade: 34, 37, 187,281,286,294-300
emissions: 202, 205, 217-220, 223, 287	urbanization: 115, 128, 155, 250, 265, 277-279
extent: 204	
management: 38, 221, 230-232, 290, 291	urban trees: 11, 27, 29, 30, 201, 202, 206, 215, 216, 227, 228, 319,320,325
"natural" management: 222, 231	
nontimber products: 38, 201, 202, 204, 217, 220, 221, 231	utilities: 7, 18,23-27,99, 106-110, 115, 132, 135, 137, 138, 141
plantations: 201, 222	194, 218,289,305, 319, 320,327-330
policies: 228-232	also see demand-side management, electricity
reforestation: 217, 222, 223	powerplant retirement: 98-102, 110,320, 323
sustainable agriculture: 216, 217, 219, 220, 290	vanpools, ridesharing: 11,22, 149, 155, 161, 162, 164, 168, 170
Tropical Forestry Action Plan: 36, 38,203,229,231, 232, 283,	variability, climate: 46-48, 50-53
284	vehicle tax: 167
roposphere: 249	Veterans Administration: 141
rucks: see automobiles and trucks	Vienna Convention for the Protection of the Ozone Layer: 283
urbines: 12, 25-27, 90, 92, 93, 95, 105, 108, 109, 320, 323	volcanoes: 47, 51
United Kingdom: 7,36,82-83,117,152,153, 165,275,278,279,	Volume Average Fuel Economy: 167
284, 297, 300, 301, 303, 305	water heating: 8, 11, 17, 107, 115-117, 124, 130-134, 314, 318
Jnited Nations	323,324
Conference on Environment and Development: 287	Weatherization Assistance Program: 19, 136,328
Development Program: 36-38,229,283,286,291	wetlands: 60
Environment Program: 36-38,229,280,283,284, 291	Wilderness Society: 212, 213
Food and Agriculture Organization: 36, 202, 205, 229,231,	windows: 17, 107, 118-121, 123, 139, 318
232, 243,263, 265, 283, 292	wind power: 18, 27, 77, 80,87, 90,99, 105, 109, 126, 138, 281,
Industrial Development Organization: 36, 284, 292	289, 290,302
Population Fund: 36,40,230, 284, 293, 294	World Bank: 37,202,221,229, 276,280,283,291-293
Statistical Commission: 291	also see multilateral development banks
World Meteorological Organization: 36	Energy Sector Management Assistance Program: 38, 283,
J.S. Department of: see Department of	291, 292
J.S. Export Council for Renewable Energy: 280,286,287,291,	environmental assessment guidelines: 36, 38, 229, 283, 291
296	funding: 36, 38,39,229,283,291,292, 300
J.S. Fish and Wildlife Service: 212, 213	Green Fund: 291, 293
J.S. Forest Service: 28, 35, 201, 204, 212, 223, 225, 231, 232,	World Climate Research Program: 283,284
282	World Meteorological Organization: 36,283, 284
below-cost sales: 29,226, 227	World Resources Institute: 232,291
Forest Products Lab: 235	zoning ordinances: 22, 135, 169, 170, 265
research: 28, 225, 226, 231	









## TRALASIA US Α ASIAEUROPE 188 Christchurch 183 Jakarta 155 Bangkok 130 Istanbul RO Lolgograd 189 Wellington 184 Northwest Cape 156 Ho Chi Minh City (Saigon) 131 Israel 190 Auckland on Corkin 185 Perth 157 Manila 132 Ankara 191 Melbourne of Arkhangel ch 186 Adelaide 158 lanzhou (lanchow) 133 Damascus 192 Sydney 92 Moscow 187 Hobart 159 Hong Kong 134 Baghdad 193 Brisbane 93 Khar kou 160 Taiwan 135 G (Saudi Arabia & Persian Gulf States) 194 G (Sulawesi, Indonesia) 94 leningrad 161 ling-Bao Bao Lan Railroads + Yellow River 95 Kice on Minsk 162 Nanjing (Nanking) 136 leheran 97 Helsinki 163 Shanghai · Yangtze River delta 137 Karachi OR Stockholm 138 Lahore 99 Warsau 164 Taiyuan 139 Ahmadahad 105 Beijing (Peking)-Tianjin (Tientsin) 100 Cratow 140 Bombay 101 Oslo 141 Delhi 183 166 Pusan 102 Lopenhagen 142 Himalava 167 Seoul 103 G (North Sea) Mountains 143 Bangalore 168 Usaka Kobe Kyoto 104 Berlin 169 Tokyo Yokohama 105 Hamburg 144 Colombo 170 Japanese squid fleet 100 Essen-Cologne 145 Madras 107 Glasgow-Edinburgh 171 Pyongyang 146 Hyderabad 108 The Netherlands 172 Shenyang 147 Allahahad 173 Sappore 100 Northern Ireland 148 Patna 174 Vladivostok 110 Dublin 149 Calcutta Ganges River delta 175 Irans Siberian Railroad 111 Manchester Birmingham Liverpool 176 Irkutsk 177 Novosibirsk 150 Dacca 112 London 151 F (SE Asian 113 Belgium 178 G (Surgut, Siberia) highlands) 114 Paris 179 Omsk 152 Rangoon 115 Porto IDENTIFICATION CHART 180 lashkent + G 153 Kuala Lumpur 110 Lisbon 181 Sverdlovsk 154 Singapore G natural gas flares 117 Madrid 182 Chelyabinsk 118 Barcelona F forest and 119 Marseille 120 Zurich

121 Milan 122 Munich

123 Rome 124 Prague

125 Lienna 12e Budapest

127 Athens 128 Bucharest

129 Odessa

agricultural fires

## KEY:

Forest and agricultural fires Natural gas flares

B

0

City lights