

# Index

*Note: \* indicates the term also appears in the Glossary. Bold page numbers indicate page spans for entire chapters. Italicized page numbers denote tables, figures and boxed material.*

*Indexer: Marilyn Anderson (United States)*

## A

**Abrupt change**, 101, 128, 233  
**Activities Implemented Jointly (AIJ)\***, 778-781  
**Adaptation\***, 41-42, 101, 141-142, 788 synergies, 81, 141-142, 623, 677-679  
**Adaptation-mitigation linkages**, 33, 35, 81, 141-142, 225-233, 623, 677-679 agriculture sector, 65, 500, 522, 523, 532, 678-679 buildings sector, 56, 435-437, 678 energy sector, 46-47, 313, 677-678 forestry sector, 70, 543, 563-566, 678-679 industry sector, 61, 450, 478, 678 transport sector, 379-380 waste sector, 612, 613  
**Adaptive capacity\***, 35, 83, 141-142, 696, 711  
**Additionality\***, 572-573, 666, 779  
**Aerosols\***, 27, 111 precursors, 37 proposed reflecting technology, 79, 625  
**Afforestation\***, 549, 550-551, 552-553, 565, 568 incentives for, 621, 660 lessons learned from, 571-572 sustainable development, 576, 727, 731 *See also* Forestry  
**Agreement\* level in this report**, 119-120, 132  
**Agreements**. *See* Policies; Voluntary agreements  
**Agriculture**, 63-67, **497-541** adaptation-mitigation linkages, 65, 500, 522, 523, 532, 678-679 barriers to mitigation, 66, 500, 525 bioenergy, 64-65, 499, 503, 506, 511, 519-520, 530, 532 biomass burning, 503, 509 bottom-up models, 511, 517 carbon flux, 499, 503, 532 carbon prices and, 64, 499, 517-518, 519 carbon sequestration, 64, 499, 506, 514, 515, 521, 525, 531 co-benefits and trade-offs, 66, 500, 522, 526-530, 673 cropland management, 506-508, 728 emissions from, 27, 29, 37, 63, 105, 190, 499, 501, 506, 531 emissions trends/projections, 63-64, 499, 500, 503-505, 639

fertilizers, 499, 500, 503, 506-507, 520, 530 fire, 509 food supply per capita, 502 grazing land management, 508-509, 728, 732 land restoration, 509-510, 522 land-use change and, 499, 508, 521-522, 530 land use in, 499, 501-502 livestock, 500, 506, 510, 531, 532, 728, 732 long-term outlook, 66-67, 500, 531-532 manure management, 510-511 methane emissions, 63, 499, 500, 501, 503, 520, 531 mitigation options, 64-65, 172, 499, 505-511, 521, 531-532, 728, 731-732 mitigation potentials and costs, 64-65, 499-500, 511-519, 531, 632, 636 mitigation scenarios, 209, 210, 211 nitrous oxide emissions, 63, 499, 500, 501, 503, 520 overview/status, 63, 499-503 policies, 66, 500, 503, 522-526, 527, 528, 531, 721 regional mitigation potentials, 514-519 regional trends, 504 rice production, 503, 504, 508, 520, 732 soil carbon, 64, 500, 503, 506, 508, 514, 515, 516, 521, 531 sustainable development, 500, 520-522, 721, 728, 731-732 technology, 64-65, 66, 218, 499, 502, 505-522, 530-531 tillage practices, 504, 507-508, 521-522, 732 top-down models, 65, 499-500, 517-518, 520 vulnerability, 65, 500, 522, 523, 532  
**Agro-forestry**, 70, 508, 543, 565-566, 574, 677  
**Air-conditioning**, 272, 280 in buildings, 54, 55, 392, 395, 398-399, 430-431 in road vehicles, 49, 338-339  
**Air pollution**. *See* Air quality  
**Air quality**, 669-676, 730 co-benefits, 390, 416, 623, 669-673 policies, 309-310, 483, 526 pollutants, 111, 484 pollution scenarios, 190-192, 213-214

waste sector issues, 607  
**Aircraft/aviation**, 51, 326, 334-335, 352-356, 364, 365 emissions from, 49, 51, 326, 331, 335 policies, 52, 375-376  
**Albedo enhancement**, 625  
**Aluminum**, 61, 63, 450, 451-452, 459, 463-464, 474  
**Ammonia**, 61, 460, 465, 474, 475, 674  
**Ancillary benefits\***, 696 forestry sector, 574 transport sector, 378-379 *See also* Co-benefits  
**Annex I countries\***, 31-32, 113, 160, 499, 649 development paths, 704-706 effects of actions, 667-668 emissions/emissions allowances, 30, 776 list of countries, 774 spillover effects, 80-81, 622-623, 665, 666  
**Annex II countries\***, 774  
**Annex B countries\***, 113, 642, 649, 667-668  
**Appliances**, 389, 394, 403, 423-425  
**Assigned amount unit (AAU)\***, 781

## B

**Backstop technology\***, 204, 650, 653, 655, 658  
**Banking\***, 747, 759  
**Barriers\*** agriculture sector, 66, 500, 525 buildings sector, 56, 389, 390, 418-421 definition, 140 forestry sector, 70, 543, 544 industry sector, 61-62, 449-450, 475-477 sustainable development, 311-312, 658 technology, 223-224  
**Baseline\***, 37-38, 41, 149-150, 178-194, 622, 626-627  
**Benchmarking\***, 63, 400, 425, 456-457, 463  
**Benefits**. *See* Co-benefits  
**Biochemical oxygen demand (BOD)\***, 471, 588  
**Biocovers\***, 601, 602, 603  
**Biodiversity\*** agriculture and, 520, 525-526, 530 CITES, 783 forestry and, 87, 574, 575, 694

- Bioenergy\***, 64-65, 499, 503, 506, 511, 519-520, 530, 532, 728  
cross-sectoral perspective, 78, 621, 677  
forestry sector, 69, 543, 549, 551, 560-561, 566, 569
- Biofilters\***, 601
- Biofuels\***, 49, 52, 304-305, 326, 341-344, 365-366, 371
- Biological sequestration. *See* Carbon sequestration**
- Biomass\***, 171, 186, 198, 207, 628-631  
abatement role, 209, 210  
burning, 188, 192, 503, 509  
cooking stoves, 83, 397, 403, 417, 729  
cross-sectoral perspective, 78, 621, 624  
energy from, 253-254, 275-277, 519-520, 560-561, 621  
fuels (*See* Bioenergy)  
mitigation potential, 628-631  
stabilization scenarios, 40, 210-211  
supply and demand, 629-631  
trade-offs, 675, 678-679
- Black carbon (BC)\***, 111, 193-194, 213-214
- Bottom-up models\***, 35, 76-77, 150, 171, 209, 626, 634-636  
agriculture sector, 511, 517  
comparison with top-down models, 76-77, 93, 635-636  
forestry sector, 69, 546-547, 551-556  
sectoral results, 639  
technology, 653, 656, 668-669
- Buildings sector, 53-58, 387-446**  
adaptation-mitigation linkages, 56, 435-437, 678  
air-conditioning, 54, 55, 392, 395, 398-399, 430-431  
air leakage, 396  
appliances, 389, 394, 403, 423-425  
barriers to mitigation, 56, 389, 390, 418-421  
building certification/labelling, 422  
building codes, 390, 421-422, 569  
building design, 389, 394-395, 416  
co-benefits, 58, 389-390, 416-418  
cooking stoves, 54, 55, 390, 403, 417  
cooling/cooling loads, 395, 397-399, 405-406  
daylighting, 402-403  
education/training/energy audits, 422-423  
electricity use, 391-392  
emissions from, 27, 29, 53, 55, 104, 105, 389, 391-393  
energy efficiency, 389, 390, 394-395, 407-408, 425-426, 429  
energy end-use, 53, 393-394  
energy management systems, 400  
energy pricing, 390, 419-420, 426-427  
European Directive on Energy Performance of Buildings, 422  
heating systems, 396-397  
hot water, domestic, 402  
HVAC systems, 399-400  
insulation, 395-396, 431  
insurance, 724, 725  
intelligent controls, 31, 55, 430  
lighting systems, 402, 423-425  
long-term outlook, 58  
mitigation options, 53, 55, 389, 393-408, 415-416  
mitigation potentials and costs, 53-55, 389, 409-416, 632, 636  
overview/status, 53, 389-392  
policies to promote mitigation, 56-58, 390, 421-435  
rebound effect, 420-421  
renewable energy, 390, 391, 400, 418  
retrofits, 389, 390, 404-405, 421-422  
solar energy, 55, 394, 396, 401, 405  
supermarket refrigeration systems, 404  
supply curves, 414-415  
sustainable development, 58, 436-437, 729  
technologies, 53-55, 58, 389, 391, 407-408, 430, 623  
thermal envelope, 395-396  
trade-offs, 405-406  
vulnerability, 56, 435-437  
windows, 396
- C**
- Cap\***, 755, 758, 767, 769, 772
- Cap-and-trade**, 89, 661, 748, 750
- Capacity building\***, 787, 789
- Carbon**  
carbon-free energy, 219-222  
cycle\*, 101, 173, 544, 571  
efficiency, 202  
flux/balance, 67-68, 499, 503, 532, 543, 544, 546-549, 564, 570  
intensity\*, 30, 44, 107-109, 172, 183-184, 218-219, 659  
leakage, 80-81, 571, 572, 622, 665-666  
low-carbon technology (*See* Low-carbon technology)  
pools\*, 511, 549-551, 573  
prices (*See* Carbon prices)  
sequestration (*See* Carbon sequestration)  
sinks (*See* Carbon sinks)  
social cost of, 42, 173, 232-233  
soil carbon, 64, 87, 500, 506, 508, 514, 515, 516, 531  
taxes, 622, 637-638, 640, 657, 667  
*See also* Biomass; Decarbonization
- Carbon capture and storage (CCS)\***, 44, 200-201, 284-286, 306  
bio-energy CCS, 210-211, 285  
CCS-ready\*, 44, 285  
costs, 286  
cross-sectoral perspective, 624  
industry sector, 61, 450, 460, 463, 475  
IPCC Special Report, 460  
mitigation potential, 298-299  
projections, 659  
technology, 218, 254
- Carbon dioxide (CO<sub>2</sub>)\***  
current concentrations, 27, 97  
emission indexing, 377  
emissions, baseline scenarios, 186-194  
emissions projections, 30, 109-110, 171, 639  
emissions trends, 30, 103-109, 103, 261-262  
equivalents\*, 27, 38, 139, 171, 229, 621  
fertilization\*, 184  
radiative forcing, 38  
stabilization targets, 229  
*See also* Carbon capture and storage; Emissions
- Carbon monoxide (CO)**, 213-214, 675
- Carbon prices\***, 76-77, 140, 205, 235-237, 621, 623, 636  
agriculture and, 64, 499, 517-518, 519  
forestry and, 543, 556-559  
macro-economic mitigation costs and, 80, 621, 647-649  
mid- to long-term, 659-661  
projections, 209, 652, 657  
technological change and, 657, 661  
tradable permits and, 747
- Carbon sequestration\***, 188-189, 210  
agriculture sector, 64, 499, 508, 510, 514-516, 522, 525, 531  
forestry sector, 67-68, 210, 211, 551, 552, 571-572  
international partnership on, 32, 784
- Carbon sinks**, 40, 113, 623  
agriculture sector, 64, 499, 501, 506  
costs, 642, 643  
forestry sector, 67-68, 544, 546-549, 554, 564, 574
- Catastrophes**, 128, 129, 175, 233
- CCS. *See* Carbon capture and storage**
- CDM. *See* Clean Development Mechanism**
- Cement**, 451-452, 460, 467, 474, 475
- Certified emission reductions (CERs)\***, 757, 779, 780
- Chlorine manufacture**, 466
- Chlorofluorocarbons (CFCs)\***, 27, 104, 392, 395, 405-406  
end-of-life issues, 606  
waste/landfill, 587, 606  
*See also* Fluorinated gases
- CHP. *See* Combined heat and power**
- Clean Development Mechanism (CDM)\***, 83, 89, 91, 113, 748, 778-781  
buildings sector, 429  
energy sector, 307  
forestry sector, 70, 543, 565, 567, 571  
industry sector, 450, 478-479  
waste sector, 72, 587, 597, 608, 609, 610
- Climate change\***  
'dangerous interference,' 32, 97, 99-100  
impacts of mitigation and adaptation on, 82, 142, 225-233  
mainstreaming, 83, 84, 98, 694, 723-725

- policies, 225, 748-749, 753-765, 795-796 (*See also* Policies)
- 'public good' and, 127
- sustainable development and, 32-34, 81-82, 119, 121-122, 121-127, 693, 695-696
- technology and, 148-152
- Climate feedback\***, 101, 173
- Climate sensitivity\***, 41-42, 173, 229-231
- Climate threshold\***, 173
- Cloud generation/enhancement**, 625
- Co-benefits\***, 81, 98, 138, 623, 669-677, 696
- agriculture sector, 66, 500, 522, 526-530, 673
- air quality, 213-214, 623, 669-673
- buildings sector, 58, 389-390, 416-418
- ecosystems, 673
- energy sector, 47, 310-311
- forestry sector, 70-71, 543, 549, 574-576
- health, 98, 416-417, 623, 670-672
- industry sector, 62, 484-485
- transport sector, 52, 378-379
- waste sector, 75, 587, 588, 610, 612, 613
- Co-generation\***, 459, 465, 469, 470-471
- Co-operative arrangements.** *See* Policies
- CO<sub>2</sub> equivalents\***, 27, 38, 139, 171, 229, 621
- Combined-cycle gas turbine (CCCGT)\***, 274, 278, 284
- Combined heat and power (CHP)**, 284, 305, 459, 465, 469, 469-470
- Competitiveness**, 81, 666-667, 709
- Compliance\***, 769, 787-788
- Conference of the Parties (COP)\***, 113, 783
- Confidence**, 34
- Cooking stoves**, 54, 55, 390, 403, 417, 670, 729
- Cost-benefit analysis\***, 42, 130, 134, 144, 173, 231-232, 235
- Cost-effectiveness analysis\***, 130
- Cost-effectiveness of policies**, 747, 751-752, 790
- Costs\***, 35, 79-80, 93, 134-140, 139-140, 625-641
- agriculture sector, 64-65, 499-500, 516-519, 531, 632, 636
- baseline, 622
- buildings sector, 55-56, 389, 409-416, 632, 636
- carbon capture and storage, 286
- decarbonization, 664
- definitions, 35, 134-136
- determinants of, 136
- discounting, 136-138, 633
- energy sector, 44-46, 286, 289-305, 632, 636
- forestry sector, 68-69, 543, 560-563, 632, 636
- industry sector, 61, 472-475, 632, 636
- irreversible, 102
- macro-economic, 79-80, 135, 172, 621, 642, 776-777
- mitigation, medium- to long-term, 658-664
- risk and uncertainty and, 134
- social cost of carbon, 42, 173, 232-233
- social costs, 35, 36, 135, 136
- stabilization, 40, 172, 203-206
- technology, 148, 650-658
- transaction and implementation, 138-139
- transport sector, 50-51, 359-366, 632, 636
- waste sector, 73-74, 589-590, 603-606, 632, 636
- Crops/cropland.** *See* Agriculture
- D**
- Dangerous anthropogenic interference**, 32, 97, 99-100
- Decarbonization**, 172, 219-222, 325, 391, 659, 660-661
- co-benefits, 669-673
- costs, 664
- Decision-making**, 34-35, 42, 119, 127-131, 173
- assumptions in, 128, 130, 131, 235
- hedging, 43, 173, 234, 663
- irreversibility and, 127-128
- risks and uncertainty, 33, 42, 119, 128-129, 142, 173
- sequential, 128-129
- support tools, 34, 130-131, 587
- See also* Trade-offs
- Deforestation\***, 504, 543, 546, 552, 574
- in Amazon basin, 552, 553
- avoided, 552, 574, 727, 731
- carbon price and, 621, 660
- causes of, 566, 721
- CO<sub>2</sub> emissions from, 104
- reduction of, 87, 550, 551-552, 565, 566-568, 574, 694, 731
- Demand-side management (DSM)\***, 425-426
- Dematerialization\***, 609
- Desertification\***, 525
- Developed and developing countries**, 82-83, 704-707
- terminology use, 160-161
- Development**, 176, 693, 699-726
- adaptation-mitigation interactions, 225-226
- equity and, 143-144
- forestry sector trends, 67
- goals, 123, 124-125 (*See also* Millennium Development Goals)
- industry sector trends, 58-59, 62, 451-452
- paradigms, 123-124
- waste sector trends, 71-72, 593-595
- See also* Development paths; Sustainable development
- Development paths\***, 33, 82-83, 173, 226, 693, 696, 699-726
- GHG emissions and, 177, 701-703
- importance of, 82-83, 700, 701, 703-704
- multiplicity of, 700-707
- opportunities to change, 82, 717-726
- regional conditions/priorities and, 704-707
- technological change and, 151
- Diesel fuel/vehicles**, 50, 325, 328, 336, 337, 675
- Direct emissions\***, 55, 104, 338, 389, 449, 587, 639
- Disclosure requirements**, 747
- Discounting\***, 136-138, 633
- Distribution and equity.** *See* Equity
- District heating\***, 265, 276-277, 279, 283, 284, 308
- Double dividend\***, 138
- E**
- Ecological footprint**, 698, 699
- Economic efficiency**, 147
- Economic potentials**, 35, 77-78, 140, 621, 631-635
- aggregate, 626-640
- agriculture sector, 499-500, 516-519
- carbon prices and, 621
- definition, 35, 140
- forestry sector, 69, 543, 551, 561-563
- overview, 632
- waste sector, 73-74, 587, 605, 606
- Economic scenarios**, 171, 176-177, 180
- Economies in transition (EITs)\***, 83, 113, 429-430, 609, 706, 774
- Economies of scale\***, 154, 661
- Ecosystem\* co-benefits**, 673
- Education**, 307
- EITs.** *See* Economies in transition
- Electric vehicles**, 50, 347
- Electricity**, 254, 260, 282, 299-305, 724
- buildings sector use/emissions, 391-392, 393
- carbon content, 637
- governance/ownership, 709
- mitigation potential, 627-628, 632
- projections, 301, 659
- savings, 457, 473, 475, 477, 621, 632, 687-690
- Embodied energy\***, 389, 391, 405
- Emission permits\***, 307, 658
- Emission quotas\***, 147, 306-307
- Emission standards\***, 754, 769, 791
- Emission trajectories\***, 171, 175, 199, 235, 647-649
- Emissions**, 27-31, 41, 97, 103, 121
- baseline scenarios, 37-38, 186-194
- cap\*, 755, 758, 767, 769, 772
- co-control, 674
- CO<sub>2</sub>-equivalents, 27, 38, 139, 171, 229, 621

- corridors, 131  
 cost metrics, 172  
 deep reduction scenarios, 621, 659-662  
 development paths and, 177, 701-703  
 drivers, 30, 178-186  
 future outlook, 109-111  
 integrated approach, 674, 675-676  
 non-CO<sub>2</sub> pathways, 392 (*See also* Fluorinated gases)  
 pathways, 196-197  
 peak (*See* Peaks)  
 projections summary, 30-31, 639  
 scenarios, 41, 171, 174-178, 186-194, 227-229, 659-662  
 sources of, 104  
 stabilization targets, 79, 229, 777  
 taxes, 156, 755-756  
 technological change and, 149-150  
 timing of reductions, 38, 43, 172, 173, 197-200  
 trading (*See* Emissions trading)  
 trends, 27-30, 102-109, 233-240  
*See also* Direct emissions; Indirect emissions; *specific gases and sectors*
- Emissions reduction unit (ERU)\*, 780**  
**Emissions trading\*, 62, 81, 89, 482, 622, 640-641, 646, 666, 667-668, 778**  
 tradable permits, 747, 750, 756-759, 767  
**Employment, 676, 730-731**  
 in specific sectors, 310, 417, 451, 520, 544, 575  
**Energy\***  
 access to, 718  
 audits, 63, 422-423, 456  
 carriers, 280-284  
 conversion, 258, 281  
 embodied\*, 389, 391, 405  
 final\*, 262, 281, 306, 393-394, 435, 460  
 global energy flows, 259  
 global resources, 264  
 intensity\*, 30, 97, 107-109, 172, 183-184  
 prices/taxation, 426-427, 626-627, 633, 637, 642, 667-668, 756  
 primary\*, 172, 256, 258, 259, 264-289  
 renewable\* (*See* Renewable energy)  
 secondary\*, 264, 281-282  
 security (*See* Energy security)  
 thermodynamics laws, 457, 472, 485  
 trends, 104, 105, 107, 261-263  
*See also* Energy efficiency; Energy security; Energy supply sector
- Energy efficiency\*, 106-107, 202, 253, 294-295, 306, 310, 325-326**  
 in buildings/appliances, 389, 390, 394-395, 407-408, 425-426, 429  
 incentives (carbon price), 621  
 industry sector, 449, 457-458, 461  
 policies supporting, 87, 425-426, 719  
 principles/overview, 394-395  
 standards and labelling, 424-425, 755
- sustainable development, 719, 729-730  
 technologies, 407-408  
 tradable certificates, 429  
**Energy security\*, 44, 87, 109, 254, 260, 306, 418, 676, 719, 725**  
**Energy Service Companies (ESCOs)\*, 417, 428-429**  
**Energy supply sector, 43-48, 251-322**  
 adaptation-mitigation linkages, 46-47, 313, 677-678  
 air quality/pollution, 309-310  
 bioenergy, 275-277, 289, 304-305, 519-520, 728  
 biomass, 253-254, 275-277, 397, 519-520, 560-561, 628-631  
 capital stock lifetime, 47, 662  
 carbon capture and storage, 284-286, 298-299, 306  
 climate change impact on, 677-678  
 co-benefits, 47, 310-311  
 coal/peat, 44, 253, 260, 262, 265-266, 294, 310, 397, 461  
 combined heat and power, 284, 305, 459, 465, 469, 469-470  
 decarbonization, 660, 664  
 decentralized energy, 288-289  
 development trends/paths, 261, 262-263, 718-720  
 electricity, 254, 260, 261-262, 282, 299-305, 627-628, 659  
 emissions from, 27, 29, 30, 44, 104, 105, 186-188, 190, 253, 289-290, 639  
 energy carriers, 44, 280-284  
 energy performance contracting, 428-429  
 energy security, 44, 109, 254, 260, 306, 418, 676, 719, 725  
 equity in, 311  
 fossil fuels, 43, 253, 260, 264, 265-268  
 fuel switching, 106-107, 294-295, 306, 310, 391, 519-520, 727, 730  
 gases/natural gas, 253, 261, 266-267, 283-284, 294-295, 624  
 geothermal, 277-278, 297-298  
 governance/ownership, 47, 709, 718-719  
 heat/heat pumps, 282-283, 396-397, 430-431  
 hydroelectricity, 273-274, 296  
 hydrogen, 44, 281, 283-284  
 inertia, 663  
 infrastructure, 478  
 long-term outlook, 47-48, 255  
 low-carbon technologies, 293-299  
 mitigation costs and potentials, 44-46, 254-255, 289-305, 621, 632, 636, 718-720, 727  
 mix of sources/carriers, 97, 253, 255, 257, 258  
 nuclear energy, 43, 44, 218, 253, 255, 260, 261, 264, 268-272, 295-296
- ocean/waves, 280  
 oil/liquid fuels, 44, 253, 257-258, 260, 267-268, 283-284, 311, 725  
 oil, unconventional, 268  
 overview/status, 43-44, 109, 253-264  
 policies and instruments, 47, 254, 255, 290, 305-314, 718-720, 724  
 primary energy resources, 264-289  
 projections, 97, 109, 255, 291, 302, 659  
 recovered energy, 289  
 renewable energy, 44, 253, 260, 264, 272-280, 296-299, 310-311  
 rural household use, 83, 725  
 scenarios, 183-184, 187, 202-203, 204  
 solar, 43, 47, 278-280, 298, 394  
 subsidies, 305-306, 419-420, 420  
 supply and demand, 30, 44, 46, 253, 254, 255, 257, 260, 302, 312, 629-631, 637  
 sustainable development, 254, 255, 263-264, 311-312, 718-720, 727, 728, 729-731  
 technologies, 44-46, 47, 151, 253, 254, 293-299, 307-308, 310-311, 313-314  
 transition in, 254, 255, 256, 659  
 transmission, distribution, and storage, 286-288  
 trends, 104, 105, 107  
 vulnerability, 46-47, 313  
 wind, 43, 274-275, 297, 310  
*See also* Energy security
- Environmental effectiveness\*, 747, 751, 790**  
**Environmental policies, 525-526, 528**  
**Environmental quality management systems, 456**  
**Environmentally sustainable technologies\*, 644**  
**Equity, 33, 35-36, 102, 112, 127, 142-147, 622, 752, 790**  
 development opportunities and, 143-144  
 economic approach, 36, 147  
 in energy supply, 311  
 inter-country measures, 143  
 inter-generational, 119, 127, 145-147  
 policies and, 145-147, 752, 790  
 rights-based approach, 36, 145, 146-147  
 traditional approaches, 35-36, 144  
 uncertainty and, 144, 147  
 utilitarian approach, 144-145, 146
- Ethanol (fuel), 272, 326, 337, 341-342, 459, 569, 730**  
**Ethics, 119**  
**Ethylene, 465, 474**  
**Evidence\*, 119-120, 132**  
**Exchange rates, 171**  
**Externality/external cost/external benefit\*, 135-136, 140**
- F**  
**F-gases. *See* Fluorinated gases**  
**Feed-in tariff\*, 306-307**

- Feedback.** *See* Climate feedback
- Fertilizers**  
 agriculture sector, 499, 500, 503,  
 506-507, 520, 530  
 manufacture/production, 449,  
 451-452, 465-466
- Final energy\***, 262, 281, 306,  
 393-394, 435, 460
- Flaring\***, 261, 311-312, 607
- Flexibility mechanisms.** *See*  
 Kyoto mechanisms
- Fluorinated gases (F-gases)**, 27, 49,  
 104, 111, 189-190, 325, 331  
 air-conditioning/refrigeration,  
 55, 392, 395, 404  
 end-of-life issues, 587, 606, 609  
 mitigation potential, 631
- Food industry**, 470-471
- Forcing.** *See* Radiative forcing
- Forecast\***, 174
- Forestry**, 67-71, **541-584**  
 adaptation-mitigation linkages, 70,  
 543, 563-566, 678-679  
 afforestation/reforestation, 549,  
 550-553, 565, 568,  
 571-572, 576, 727, 731  
 agro-forestry, 70, 508, 543,  
 565-566, 574, 677  
 area of forests, 544-545  
 barriers to mitigation, 70, 543, 544  
 bioenergy, 69, 543, 549, 551,  
 560-561, 566, 569  
 bottom-up studies, 69,  
 546-547, 551-556  
 capital stock lifetime, 660, 662  
 carbon density, 69, 549, 551  
 carbon flux/balance, 67-68, 543,  
 544, 546-549, 564  
 carbon sequestration, 67-68, 210,  
 211, 551, 552, 571-572  
 climate change and, 543, 544,  
 563, 564, 569-570  
 co-benefits and trade-offs, 70-71,  
 543, 549, 574-576  
 deforestation, Amazon basin, 552, 553  
 deforestation, avoided, 552,  
 574, 727, 731  
 deforestation, reducing, 87, 550,  
 551-552, 565, 566-568, 574  
 emissions from, 27, 29, 67-68, 104-106,  
 186, 543, 546-547, 548  
 forest management, 543, 546, 549,  
 568-569, 570, 574, 727, 731  
 forests\*, importance of, 543, 544  
 global assessments, 551-563  
 global modelling, 543, 556-559  
 Kyoto Protocol/CDM and, 543,  
 565, 567, 571  
 land use/land-use change, 67-68,  
 104-106, 184-186, 190,  
 543, 546-547, 564, 568  
 leakage, 571, 572  
 lessons learned, 571-572  
 long-term outlook, 71, 577-578  
 mitigation options and costs, 68-69,  
 172, 544, 547-563, 549, 727  
 mitigation potentials and costs,  
 68-69, 212, 213, 543, 544,  
 551-563, 632, 636  
 overview/status, 67, 543-546  
 policies, 70, 566-573, 721, 724  
 pulp and paper industry, 449,  
 469-470, 474  
 regional trends, 543, 546-547, 548  
 scenarios, 210, 211, 553, 556-559  
 sustainable development, 70-71,  
 543, 566, 573-576, 721,  
 723-725, 727, 731  
 technology, 68, 71, 576-577  
 time scales of effects, 68, 543, 549, 550  
 top-down models, 67, 69, 543, 547  
 voluntary actions, 569, 571  
 vulnerability, 70, 543, 563-566  
 wood/forest products, 546, 549, 551  
*See also* Afforestation; Deforestation
- Fossil fuels\***, 43-44, 97, 102, 111  
 in energy sector, 253, 260, 264, 265-268  
 in industry sector, 449, 451  
 prices, 44, 81, 260, 622-623  
 subsidies, 89, 761-762  
*See also* Oil
- Free Rider\***, 102, 791
- Fuel cells\***, 283-284, 288-289, 345-347
- Fuel switching\***, 106-107, 294-295,  
 306, 310, 391, 624, 727, 730  
 in agriculture, 64, 499, 506,  
 511, 519-520  
 in industry, 458, 461-463  
*See also* Bioenergy
- Fuels**  
 alternative, 50, 325, 341-347, 354-355  
 diesel, 675  
 ethanol, 272, 326, 337, 341-342,  
 459, 569, 730  
 fuel economy, 52, 327, 361, 372-374  
 fuel recovery, 458-459  
 oxy-fuel combustion, 460  
 waste materials as, 458, 462  
*See also* Energy; Fossil fuels; Transport
- Full-cost pricing\***, 702
- G**
- G8 Gleneagles meeting**, 32, 257
- General circulation model (GCM)\***, 133, 231
- General equilibrium analysis\***, 665
- Geo-engineering\***, 78-79, 621, 624-625
- Global Environmental Facility (GEF)\***, 786
- Global Environmental Mechanism**, 782-783
- Global warming\***, 100, 101, 133
- Global warming potentials (GWPs)\***,  
 103, 189, 195-196
- Governance**, 693, 708, 709-711, 714, 716
- Grazing.** *See* Agriculture; Livestock
- Green accounting\***, 130, 131
- Green Investment Scheme (GIS)**, 778, 781
- Green marketing**, 711-712
- Greenhouse gases (GHGs)\***  
 abatement measures, 172, 200-203  
 CO<sub>2</sub> equivalents, 27, 38, 139,  
 171, 229, 621  
 current emissions, 27, 97  
 direct effect, 102  
 drivers of emissions, 30, 178-186  
 Kyoto Protocol gases, 27, 113  
 mitigation potentials (*See*  
 Mitigation potentials)  
 Montreal Protocol gases, 27, 110  
 multi-gas scenarios, 40, 171-172,  
 195-196, 207, 208,  
 638, 639, 647  
 non-CO<sub>2</sub> (*See* Non-CO<sub>2</sub> gases)  
 projections, 30-31, 109-111, 639  
 regional per capita emissions, 30  
 sources of, 104  
 substitution, 195-196  
 trends, last 3 decades, 27-30, 102-109  
*See also* Emissions; Stabilization;  
*specific gases*
- Gross Domestic Product (GDP)\***,  
 37, 107, 172, 646, 698-699  
 conversion metrics, 38, 180-183  
 determinants/assumptions, 176-177  
 growth rates, 180, 181  
 MER/PPP and, 38, 171, 180-183  
 mitigation and, 621-622,  
 647-649, 707-708  
 projections, 204-206, 657
- Guardrail analysis**, 231
- H**
- Health**  
 biomass cooking stoves and, 417  
 co-benefits, 98, 416-417, 623, 670-672  
 energy supply and, 311
- Heating systems**, 396-397
- Hedging**, 43, 173, 234, 663, 773
- Hot air\***, 640, 642
- Hybrid vehicles\***, 50, 326, 339-341
- Hydrochlorofluorocarbons (HCFCs)**, 27,  
 392, 395, 405-406, 449, 451, 454  
 end-of-life issues, 606, 609  
 manufacture, 466, 476  
 waste/landfill, 587, 606
- Hydrofluorocarbons (HFCs)\***, 27,  
 104, 190, 392, 395, 405-406  
 emissions projections, 639  
 end-of-life issues, 606  
 from industry, 449, 451, 454,  
 466, 471-472, 476
- Hydrogen**, 44, 281, 283-284, 624  
 fuel-cell vehicles, 50, 345-347  
 industry sector use, 450, 460, 467  
 international partnership on, 32, 784

- Implementation\***, 92, 97, 112-113, 119  
costs, 138-139  
Johannesburg Plan for (JPOI), 112, 309  
sustainable development and CC  
policies, 125-127  
UNFCCC Article 2, 100-102  
*See also* Joint Implementation
- Incentives**, 88-89, 622, 660-661, 762  
agriculture sector, 500, 525, 528  
buildings sector, 390, 419, 427  
energy sector, 253, 259, 306  
forestry sector, 569  
industry sector, 481, 484  
transport sector, 327, 365, 368  
waste sector, 607  
*See also* Carbon prices
- Income elasticity (of demand)\***, 369
- Indirect emissions\***, 338, 449,  
452-453, 587, 639
- Industry**, 58-63, **447-496**  
adaptation-mitigation linkages,  
61, 450, 478, 678  
aluminum, 61, 63, 450, 451-452,  
459, 463-464, 474  
barriers to mitigation, 61-62,  
449-450, 475-477  
biomass energy use, 629  
capital stock lifetime, 660, 662  
carbon capture and storage, 61,  
450, 460, 463, 475  
cement, 451-452, 460, 467, 474, 475  
chemicals and fertilizers, 449,  
451-452, 464-466  
co-benefits, 62, 484-485  
cogeneration (CHP), 459, 465,  
469, 470-471  
development trends, 58-59, 62, 451-452  
electricity savings, 457, 473, 475, 477  
emissions from, 27, 29, 59-61,  
104, 105, 186-188, 190,  
449, 451-454, 639  
emissions trading, 62, 482  
energy efficiency, 449, 457-458, 461  
energy-intensive industries,  
61, 449, 451-452  
energy use overview, 449, 460  
food industry, 470-471  
fuel switching, 458, 461-463  
heat and power recovery, 458-459  
hydrogen use/manufacture,  
450, 460, 467  
inter-industry options, 472  
iron and steel, 449, 451-452, 458,  
460, 460-463, 474, 475  
Kyoto mechanisms, 478-479  
long-term outlook, 63, 450, 487  
magnesium, 464  
management practices/benchmarking,  
456-457, 463  
materials efficiency and recycling,  
61, 455, 459-460  
minerals, 449, 467-469  
mitigation options, 61, 449, 451,  
454-456, 460-472, 487, 632  
mitigation potentials and costs, 61, 449,  
472-475, 474-477, 632, 636  
non-CO<sub>2</sub> gases, 449, 473, 475, 476, 482  
non-ferrous metals, 449, 463-464  
operating procedures and  
technologies, 456-460  
overview/status, 58-59, 449-454  
oxy-fuel combustion, 460  
petroleum refining, 449, 460,  
466-467, 474, 475  
policies, 61-62, 450, 452,  
478-484, 486-487  
pulp and paper, 449, 469-470, 474  
recycling, 459, 469-470  
renewable energy, 459  
sustainable development, 450, 477-478,  
483, 711-713, 729-730  
taxes and subsidies, 481-482  
technologies, 62-63, 454-472,  
482-487, 623  
technologies, process-specific, 460-472  
technology transfer, 449, 450, 452, 476  
trade, 452  
voluntary actions, 62, 792-793  
voluntary agreements, 62, 450,  
479-481, 747, 760  
vulnerability, 61, 62, 450, 478  
waste fuels, 458, 462
- Inertia\***, 33, 101, 177, 226,  
450, 487, 662-663
- Information instruments**, 89, 747,  
750, 764-765, 767
- Information technology (IT)**, 624, 669
- Infrastructure**  
energy sector, 312  
technology sector, 148, 156  
transport sector, 332
- Innovation**. *See* Technological change
- Institutions**, 112-114, 178, 708-717  
adaptation/mitigation capacity  
and, 124, 141  
technology and, 148, 156
- Insurance**, 129, 724, 725, 788
- Integrated approach to mitigation**,  
92-93, 674, 675-676
- Integrated assessment\***, 34,  
130-131, 173, 229-233
- Integrated Design Process  
(IDP)\***, 389, 416
- Intellectual property**, 156
- Intelligent controls\***, 31, 55, 430
- Intensities**, 107-109  
carbon, 30, 44, 107-109, 172,  
183-184, 218-219, 659  
energy, 30, 97, 107-109, 172, 183-184
- Inter-generational equity**, 119,  
127, 145-147  
*See also* Equity
- International agreements**,  
89-92, 748, 768-791
- International finance**, 724, 725
- Inverse modelling**, 231
- Investments**, 663-664  
irreversible, 102, 128  
in technology, 91, 128, 621, 747
- Iron and steel industry**, 449, 451-452,  
458, 460, 460-463, 474, 475
- Irreversibility**, 102, 127-128, 142
- IT (information technology)**, 624, 669
- J**
- Johannesburg Plan for Implementation  
(JPOI)**, 112, 309
- Joint Implementation (JI)\***,  
113, 450, 478, 781  
waste sector, 587, 597, 608, 609, 610
- K**
- Kyoto mechanisms\***, 113,  
429-430, 478-479  
flexibility mechanisms, 429-430  
spillover effects, 666  
*See also* Clean Development  
Mechanism; Joint  
Implementation
- Kyoto Protocol\***, 31-32, 89, 97,  
113, 642-643, 748, 791  
achievements of, 89, 748  
Article 10(c), 158  
compliance mechanism, 787  
policy analysis, 642-646  
post-Kyoto studies, 91, 646-649  
*See also* Kyoto mechanisms
- L**
- Land-use\***, 97, 104-106, 190,  
207-213, 366-368  
emissions, 27, 29, 184-186, 188-189  
investments, timing of effects, 622  
mitigation, cost-effectiveness,  
40, 209, 210  
mitigation options/scenarios,  
172, 207-213  
policies, 765  
scenarios, 171, 172, 188-189, 207-213
- Land-use change**, 67-68, 184-186  
agriculture sector, 499, 508,  
521-522, 530  
forestry sector, 67-68, 104-106,  
184-186, 190, 543,  
546-547, 564, 568
- Landfill\***  
methane, 71-72, 587, 588, 589,  
595-596, 597-598, 600-601  
taxes, 609
- Leakage**, 80-81, 571, 572, 622, 665-666
- Learning by doing\***, 153, 157,  
172, 651, 656, 661
- 'Learning curves'**, 154-155
- Life cycle analysis (LCA)**, 347,  
389, 587, 588
- Likelihood\***, 34

- Litigation**, 793-794
- Livestock**, 500, 506, 510, 531, 532, 728, 732
- Lock-in effect\***, 43, 149-150, 258, 622, 663
- Low-carbon technology\***, 128, 150-151, 293-299, 622, 658, 659, 661, 664
- LUCF/LULUCF (land use, land-use change and forestry)**, 104-106, 190
- M**
- Macro-economic costs\***, 79-80, 135, 172, 621, 642, 647-649, 776-777
- Macroeconomics**, 642-650, 723, 724  
exchange rates (MER), 171, 180-183  
Kyoto Protocol policy analysis, 642-643  
national and regional studies, 643-646  
policies, 525, 526, 527, 721-722  
post-Kyoto studies, 91, 646-649  
top-down models, 171
- Magnesium**, 464
- Mainstreaming**, 83, 84, 98, 694, 723-725
- Marginal cost pricing\***, 204
- Market barriers\***, 305
- Market-based regulation\***, 91, 751-752, 755, 767, 770
- Market distortions and imperfections\***, 138, 622, 766
- Market equilibrium\***, 236
- Market Exchange Rate (MER)\***, 38, 171, 180-183
- Market potential**, 35, 140
- Marrakech Accords**, 113, 783
- Material efficiency options\***, 61, 455, 459, 633, 634
- Measures\***. *See* Policies
- Meat, demand for**, 502-503
- MER**. *See* Market Exchange Rate
- Methane (CH<sub>4</sub>)**, 103, 110, 189-190, 331  
agriculture/livestock emissions, 63, 499, 500, 501, 503, 520, 531  
coal-bed, 262  
emissions projections, 73, 639  
industry emissions, 449, 451  
international partnership on, 32  
landfill emissions, 71-72, 73, 587, 588, 589, 595-596, 597-598, 600-601  
as ozone precursor, 674-675  
recovery\*, 71, 73, 587, 600-601, 607-608  
transport emissions, 49, 325, 331  
from water reservoirs, 273-274, 296  
*See also* Natural gas
- Millennium Development Goals (MDGs)\***, 112, 124-125, 126, 788  
energy sector, 311-312  
forestry sector, 574  
waste sector, 593, 610
- Millennium Ecosystem Assessment (MEA)**, 125
- Mitigation\***  
cross-sectoral perspective, 76-81, 619-690  
framing issues, 33-37, 117-167  
integrated approach, 92-93, 674, 675-676  
introduction/overview, 27-33, 95-116  
linkages/interactions with adaptation (*See* Adaptation-mitigation linkages)  
long-term context, 37-43, 169-250  
paths ('emissions corridors'), 131  
roadmap of this report, 27, 114-115  
timing of, 33, 38, 173
- Mitigation costs**. *See* Costs
- Mitigation potentials**, 93, 139-140, 625-641, 632  
aggregate, 625-641, 687-690  
agriculture sector, 64-65, 499-500, 511-519, 531, 632, 636  
baseline, 626-627  
bottom-up studies, 35, 76-77, 634-636  
buildings sector, 53-55, 389, 409-416, 632, 636  
carbon prices and, 517-518, 519, 636  
cross-sectoral perspective, 76-79, 621-622, 625-641  
definitions, 35, 140  
energy sector, 44-46, 254-255, 289-305, 632, 636, 718-720, 727  
forestry sector, 68-69, 212, 213, 543, 544, 551-563, 632, 636  
industry sector, 61, 449, 472-475, 474-477, 632, 636  
medium-term to long-term transition, 658-664  
sustainable development, 694  
top-down studies, 35, 76-77, 635-636  
transport sector, 50-51, 325-326, 357-366, 632, 636  
waste sector, 73-74, 589-590, 603-606, 632, 636  
*See also* Economic potentials
- Mitigation scenarios**, 175-176, 194-217  
introduction/concepts, 194-197  
long-term scenarios, 197-214  
regional and national scenarios, 214-217
- Mitigative capacity\***, 35, 83, 141-142, 693-694, 696, 711
- Models**  
bottom-up (*See* Bottom-up models)  
general circulation model, 133, 231  
integrated assessment, 130-131, 173, 229-233  
inverse modelling, 231  
top-down (*See* Top-down models)
- Montreal gases**, 27, 110
- Montreal Protocol\***, 27, 676
- Multi-attribute analysis\***, 130
- Multi-gas\* studies/options**, 40, 171, 172, 195-196, 207, 208, 638, 639, 647
- Multilateral Environmental Agreements (MEAs)**, 127, 788
- N**
- Natural gas**, 253, 261, 266-267, 283, 294-295, 344-345, 624
- NGOs**. *See* Non-governmental organizations
- Nitrogen fertilizers**, 449, 451-452, 465, 500, 506-507
- Nitrogen oxides (NO<sub>x</sub>)**, 37, 49, 192-193, 213-214, 607, 675
- Nitrous oxide (N<sub>2</sub>O)\***, 103, 110, 189-190, 325, 331  
agriculture emissions, 63, 499, 500, 501, 503, 520  
emissions projections, 639  
industry emissions, 449, 451, 454, 464, 466, 476  
transport emissions, 49, 325, 330, 331  
waste sector emissions, 71, 587, 589, 595, 596, 598-599
- NMVOs (non-methane volatile organic compounds)**, 607
- No regrets policies/options\***, 76, 623, 670
- Non-Annex I Countries/Parties\***, 80-81, 160, 499, 503, 555-556, 774  
emissions/emissions allowances, 30, 776  
waste sector emissions, 596, 607-608
- Non-CO<sub>2</sub> gases**, 37, 189-190, 206-207  
buildings sector, 392, 430-431  
industry sector, 449, 473, 475, 476, 482  
*See also* Fluorinated gases;  
Methane; Nitrous oxide
- Non-governmental organizations (NGOs)**, 62, 89, 127, 708, 713-714, 748, 792-793
- Non-market impacts**, 130, 139, 173
- Normative analysis\***, 130-131, 137, 160
- NO<sub>x</sub>**, 37, 49, 192-193, 213-214, 607, 675
- Nuclear energy**, 43, 44, 218, 253, 255, 260, 261, 264, 268-272, 784  
costs/mitigation potentials, 295-296  
fusion energy, 271-272  
risks/impacts, 44, 269, 677  
waste management, 269-270
- O**
- Ocean fertilization**, 79, 621, 624-625
- ODS**. *See* Ozone-depleting substances
- OECD countries**, 774
- Oil**, 44, 253, 257-258, 260, 267-268, 283-284, 311, 725  
import security/policies, 724, 725  
peak in production, 44, 253, 325, 330-331  
prices, 622-623, 626, 667-668  
refining, 449, 460, 466-467, 474, 475  
subsidies, 761-762
- Oil sands and oil shale\***, 253, 266, 268, 325, 331
- OPEC**, 83, 667-668, 707
- Opportunities\***, 140
- Organic carbon (OC)**, 193-194, 213-214, 506, 508

- Oxy-fuel combustion**, 460
- Ozone (O<sub>3</sub>)\***, 391, 509, 675  
precursors\*, 49, 674-675
- Ozone-depleting substances (ODS)**,  
27, 102, 110, 471, 476, 676  
IPCC Special Report, 466  
*See also* Chlorofluorocarbons;  
Hydrochlorofluorocarbons;  
Hydrofluorocarbons
- P**
- Partnerships**, 82, 693, 714, 715, 793
- Passive solar design\***, 55,  
278-280, 396, 623
- Peaks**  
emissions, 100, 172, 173, 197,  
198-200, 219, 227, 229  
oil production, 44, 253, 325, 330-331
- Perfluorocarbons (PFCs)\***, 27, 61, 190,  
449, 451, 454, 471-472, 476, 639
- Performance standards**, 754
- Petroleum**. *See* Oil
- Physical potential**, 140
- Policies\***, 87-92, 97-98, 107,  
642-646, **745-807**  
actions, 91, 769, 777-784  
adaptation and, 788  
air quality/pollution, 309-310, 483  
capacity and, 35  
capacity building, 787, 789  
CDM/JI, 778-781  
climate change policies, 92-93,  
748-749, 753-765, 795-796  
commitments/timetables, 91  
compliance, 769, 787-788  
coordination/harmonization,  
91, 781-783, 789  
cost-effectiveness, 747, 751-752, 790  
costs and, 776-777  
criteria and assessment, 88, 92, 130,  
751-752, 766-768, 789-791  
cross-sectoral perspective, 637-640  
definitions, 750, 769  
distribution/equity aspects,  
145-147, 752, 790  
environmental effectiveness,  
747, 751, 790  
financing, 747, 784-787  
flexibility provisions, 747, 777-778  
goals, 90, 748, 769-773, 775-776  
information instruments, 89, 747,  
750, 764-765, 767  
institutional feasibility, 752, 790-791  
interactions between levels, 794-795  
international agreements, 89-92,  
748, 768-791  
international agreements, proposals  
for, 90, 768-769, 770-772  
international emissions trading, 778  
linkages, 90, 119, 121, 225,  
233-240, 748-749,  
765-766, 778, 794-795  
litigation on climate change, 793-794  
local, regional, corporations, and  
NGOs, 89, 748, 791-795  
macro-economic, 525, 526, 527,  
721-722, 724, 776-777  
market mechanisms, 91  
national policies, 87-89, 747-748,  
753-768, 789  
national policy styles, 82, 693, 709-710  
national/regional policy  
studies, 643-646  
negotiating process, 788-789  
non-climate, 91-92, 378, 449,  
503, 525-526, 566-567,  
609-610, 750, 765  
non-CO<sub>2</sub> gases, 430-431, 482, 483  
optimization models, 130  
overview, 750-753  
participation, 90, 769, 773-776  
portfolio of, 87, 233, 747  
private partnerships, 82, 793  
regulations and standards, 87, 747,  
750, 753-755, 767  
sectoral approaches, 772, 781, 789  
short-term emissions, 233-240  
stringency, 90-91, 747, 748, 775-777  
subsidies and incentives, 88-89,  
747, 750, 760-762, 767  
sustainable development, 82,  
91-92, 693-694, 696,  
716-726, 774, 784, 789  
synergies, 97-98, 669-677  
taxes and charges, 87, 747, 750,  
753, 755-756, 767  
tradable permits, 88, 747, 750,  
756-759, 767  
trade, 721-722  
voluntary actions, 88, 791-795  
voluntary agreements, 88, 747,  
750, 759-760, 761, 767  
*See also specific sectors*
- Population**, 30, 38, 107, 171, 179, 531
- Portfolio analysis\***, 80, 172, 621, 640-641
- Portfolios**  
of policies, 87, 233, 747  
of technologies, 36, 80, 172, 621, 658
- Post-consumer waste\***, 587, 588, 599-607  
*See also* Waste management
- Potential\***. *See* Mitigation potentials
- Poverty**, 100-101, 418, 710
- Power generation**. *See* Energy  
supply sector
- PPP**. *See* Purchasing Power Parity
- Pre-industrial\*-level temperature**,  
42, 100, 228
- Precautionary principle\***, 100,  
112-113, 129, 134
- Present value\***, 119, 134, 136
- Price elasticity of demand\***, 367,  
369, 375, 426, 433
- Primary energy\***, 172, 256, 264-289  
conversion, 258, 259  
scenarios, 183-184, 187, 202-203, 204  
sources, 259
- Production frontier\***, 694, 722
- Public good**, 102, 127, 141
- Public transport**, 51, 326, 329,  
330, 349-350
- Purchasing Power Parity (PPP)\***,  
38, 171, 180-183
- R**
- Radiative forcing\***, 38, 102, 103,  
103-104, 171-172  
proposed new technologies, 625
- Randomness**, 132
- Rapid change**. *See* Abrupt change
- Rebound effect\***, 420-421
- Recycling**, 72, 459, 469-470, 587, 728  
agricultural by-products, 519-520, 532
- Reforestation\***, 550-551, 552-553, 565, 568  
*See also* Afforestation; Forestry
- Regional cooperation**, 113-114
- Regional differentiation**, 97, 106
- Regional dimensions**, 37, 160-161, 774
- Regulatory standards**, 87, 747,  
750, 753-755
- Reinsurance**, 129
- Renewable energy\***, 44, 87, 253, 260,  
264, 272-280, 296-299, 310-311  
buildings sector, 390, 391, 400, 418  
industry sector, 459  
international partnership in, 784  
waste sector, 587, 588-589,  
600-601, 607-608  
*See also* Bioenergy
- Research and development (R&D)**, 36-37,  
89, 113-114, 152-153, 154, 218-224  
agriculture sector, 66, 530-531  
buildings sector, 58, 430  
energy sector, 47, 313-314  
expenditures, 112  
forestry sector, 71, 576-577  
industry sector, 62-63, 450, 485-487  
investments, 91, 621, 650-652, 747  
policies, 89, 156, 747, 750,  
762-764, 767, 784, 789  
trends, last 3 decades, 112  
waste sector, 75-76
- Reservoirs\***  
CO<sub>2</sub> storage, 285-286  
water, 273-274, 296
- Residential and commercial buildings**.  
*See* Buildings sector
- Retrofits**  
buildings sector, 389, 390,  
404-405, 421-422  
industry sector, 465-466
- Rice production**, 503, 504, 508, 520, 732
- Risk**, 33, 101, 131-134, 788  
of catastrophes/abrupt change, 128, 129  
criteria for acceptability, 134  
decision making and, 34, 42, 97, 100,  
119, 128-129, 131-134  
definition, 131  
management, 33, 42-43, 173, 225, 234  
vocabulary, 132



## S

**Safe landing approach.** *See* Tolerable windows approach

**Scenarios\***, 171-173, 174-217  
 baseline, 37-38, 41, 178-194, 626-627  
 definition and purpose, 174-175  
 emissions, 174-178  
 global futures, 175  
 mitigation, 175-176, 194-217  
 multi-gas\*, 171  
 overview/concepts, 175-178  
 stabilization, 38-42, 171-172, 173, 175-176, 194-214, 235-240  
 technology, 149-150, 172  
 types of, 174  
 uncertainty/likelihood in, 133

**Secondary energy\***, 264, 281-282

**Semiconductor manufacture**, 471

**Sensitivities**, 76, 621, 633  
*See also* Climate sensitivity

**Sequestration\***. *See* Carbon sequestration

**Social capital**, 141, 713

**'Social contract'**, 144-145

**Social cost of carbon (SCC)\***, 42, 173, 232-233

**Social costs**, 35, 36, 135, 136

**Social justice**, 35, 119, 144-145  
*See also* Equity

**Soil carbon**, 64, 87, 500, 506, 508, 514, 515, 516, 531

**Solar energy**, 43, 47, 278-280, 298, 394  
 active collection/transformation of, 401  
 passive solar heating, 55, 396, 623  
 retrofits, 405

**Solar forcing, proposed blocking technologies**, 621, 625

**Spillover effects\***, 36, 80-81, 153-154, 622-623, 658, 664-669  
 carbon leakage, 665-666  
 nature and importance of, 664-665  
 technology, 36, 153-154, 658, 668-669

**SRES scenarios**, 133, 171, 626  
*See also* Scenarios

**Stabilization\***  
 categories/pathways, 42, 79-80, 229  
 choices/decisions, 97, 172  
 costs, 40, 172, 203-206  
 deep emissions reduction scenarios, 621, 659-662  
 scenarios, 38-42, 171-172, 173, 175-176, 194-214, 235-240  
 stringency of measures, 38, 41-42, 79  
 targets, 38-40, 42-43, 172, 194-195, 205, 229, 234-235, 621, 777  
 technological change and, 151  
 trajectories, 647-649

**Standards\***, 52, 87, 424-425, 747, 750, 753-755, 767

**Standby and low-power mode**, 55, 423

**Steel industry**, 449, 451-452, 458, 460, 460-463, 474, 475

**Stock lifetimes**, 660, 662-663

**Storylines\***, 174-175

**Structural change\***, 177, 183, 185, 187, 216, 218

**Subsidies\***, 88-89, 750, 760-762, 767  
 energy sector, 305-306, 420, 426-427  
 fossil fuel, 668  
 industry sector, 481  
 transport sector, 378  
 waste sector, 608

**Sulphur dioxide**, 37, 190-192, 213, 309

**Sulphur emissions, global**, 27

**Sulphur hexafluoride (SF<sub>6</sub>)\***, 190, 431, 449, 451, 454, 463-464, 471, 476, 639

**Sunlight blocking**, 79, 625

**Surprises**, 133, 142

**Sustainable development\***, 81-87, 100-101, 121-127, 691-743  
 barriers to, 311-312, 658  
 citizens' groups, 82, 693, 713  
 civil society, 82, 708, 713-716  
 climate change and, 32-34, 119, 121-122, 121-127, 693, 695-696  
 climate policies and, 733  
 concept, 81, 122-123, 693, 695, 696-698  
 cross-sectoral impacts, 730-731  
 deliberative democracy, 716  
 developed and developing economies, 82-83, 693-694, 704-707  
 development paradigms, 123-124  
 development paths, 82-83, 699-726  
 development paths, changing, 82, 717-726  
 economies in transition, 83, 706  
 governance, 693, 708, 709-711, 714, 716  
 implementation, 125-127  
 lower emissions, economic growth pathways and, 707-708  
 mainstreaming, 83, 84, 694, 723-725  
 market, 711-713  
 measurement/indicators, 82, 477, 693, 698-699  
 mitigation choices/options and, 82-87, 694, 695, 726-733  
 national policy styles, 82, 693, 709-710  
 partnerships, 82, 693, 714, 715  
 policies and, 82, 91-92, 693-694, 696, 716-726, 774, 784, 789  
 private sector, 82, 693, 708, 713  
 regional conditions/priorities and, 704-707  
 relationship with climate change, 33-34, 82, 119, 121-122, 693, 695-696  
 relationship with mitigation, 81-82, 693  
 research needs, 733-734  
 spillover impact on, 666  
 synergies, 97-98, 623  
 trade-offs, 694  
 transition theory, 714-715, 716  
 UNFCCC Article 2, 97, 697-698  
*See also specific sectors*

**Synergies**, 669-677  
 adaptation-mitigation, 81, 141-142, 623, 677-679  
 buildings sector, 436-437  
 forestry sector, 543, 564-566  
 mitigation-other policy areas, 669-677

## T

**Targets and timetables\***  
 emissions targets, 172, 194-195, 205, 229, 234-235, 621, 777  
 radiative forcing targets, 38  
 stabilization targets, 38-40, 42-43, 172, 194-195, 205, 229, 234-235, 621, 777  
 temperature targets, 38, 234-235

**Taxes\***, 87, 723, 747, 755-756, 767  
 carbon tax, 622, 637-638, 640, 657, 667  
 climate change levy, 753  
 definition, 750  
 emissions taxes, 156, 755-756  
 energy taxes, 426-427, 642, 756  
 industry sector, 481  
 poverty tariff, 710  
 tax credits, 88-89, 607  
 transport sector, 52, 326-327, 368-370  
 waste sector, 608, 609

**Technical potential**, 35, 140, 514-516

**Technological change\***, 36-37, 80, 150-158, 622, 661-662  
 bottom-up models, 653, 656, 668-669  
 defining characteristics, 152  
 dynamics and drivers, 209, 222-224  
 endogenous, 622, 650-652, 653-658  
 exogenous, 650-652  
 importance of, 148-149, 172  
 'learning and experience curves,' 154-155  
 learning by doing, 153, 157, 172, 651, 656  
 phases of, 36, 152  
 public-sector role in, 156-158  
 research and development, 36-37, 152-153, 154, 156, 218-224, 222  
 scenarios, 149-152  
 sources of, 36, 152-155  
 'supply push' and 'demand pull,' 37, 155, 156-158, 662  
 top-down models, 653, 654-655, 668

**Technology\***, 36-37, 119, 147-160, 218-224  
 agreements, 783  
 agriculture sector, 64-65, 66, 218, 499, 502, 530-531  
 aviation, 353-354  
 barriers, 223-224  
 buildings sector, 58, 389, 390, 391, 407-408, 418-421, 430  
 carbon-free energy/decarbonization, 219-222  
 climate change and, 148-152  
 cross-sectoral mitigation, 623-625

- development and commercialization  
of, 155-156, 157
- energy sector, 44-46, 47, 151, 253,  
254, 293-299, 307-308,  
310-311, 313-314
- forestry sector, 68, 71, 576-577
- industry sector, 62-63, 450, 454-472,  
482-483, 485-487
- infrastructure, 148, 156
- investment in, 91, 102, 128, 621,  
661, 663-664, 747
- lock-in effect, 149-150, 258, 622, 663
- modelling, 650-658
- policies, 482-483, 783-784
- portfolio, 36, 80, 172, 621, 658
- role in mitigation, 41, 218-224
- scenarios, 36, 149-152, 172
- spillovers, 36, 153-154, 658, 668-669
- standards, 754
- technology-level analysis, 135
- transport sector, 335-357
- waste sector, 73, 75-76, 587, 599-603
- See also* Research and development;  
Technological change;  
Technology transfer
- Technology transfer\***, 37, 91,  
113-114, 119, 158-160
- barriers to, 224, 669
- definition, 158
- industry sector, 63, 449, 450, 622
- policies, 783-784
- Temperature**
- climate sensitivity and, 173
- linking emission scenarios to, 227-229
- pre-industrial level, 42, 100, 228
- targets, 38, 234-235
- Thermodynamics, laws of**, 457, 472, 485
- Threshold.** *See* Climate threshold
- Timetables.** *See* Targets and timetables
- Timing of mitigation**, 33, 38, 43, 173
- See also* Inertia
- Tolerable windows approach  
(TWA)\***, 131, 231
- Top-down models\***, 35, 76-77,  
150, 171, 181, 236-238
- agriculture sector, 65, 499-500,  
517-518, 520
- comparison with bottom-up models,  
76-77, 93, 635-636
- forestry sector, 67, 69, 543, 547
- summary of results, 639
- technology, 653, 654-655, 668
- Tradable permits\***, 47, 88, 747,  
750, 756-759, 767
- Trade agreements**, 783
- Trade-offs**, 128, 130, 234, 669-677
- adaptation-mitigation, 141-142, 234-235
- agriculture sector, 500, 522, 526-530
- biomass, 675
- buildings sector, 405-406
- diesel, 675
- economic efficiency-equity, 147
- forestry sector, 543, 549
- Trade policies**, 721-722
- Transition theory**, 714-715, 716
- Transport**, 48-53, **323-385**
- access to, 329-330
- aerodynamics improvement, 338
- air conditioning systems, 49, 338-339
- aircraft/aviation, 49, 51, 52, 326,  
331, 334-335, 352-356,  
364, 365, 375-376
- alternative fuels, 50, 325,  
341-347, 354-355
- biofuels, 49, 52, 304-305, 326,  
341-344, 365-366, 371
- bus rapid transit (BRT), 349-350
- co-benefits/ancillary benefits,  
52, 378-379
- development and, 328-329,  
332, 720-721
- diesel fuel/vehicles, 50, 325,  
328, 336, 337, 675
- drive train efficiency/design, 339-341
- driving practices (eco-driving), 351
- electric vehicles, 50, 347
- emissions from, 27, 29, 49, 104, 105,  
325, 328, 329, 330, 334, 639
- energy efficiency, 325-326
- flexfuel vehicles (FFVs), 342
- freight transport, 325, 330
- fuel economy, 52, 327, 361, 372-374
- hybrid vehicles, 50, 326, 339-341
- hydrogen/fuel cells, 50, 345-347
- infrastructure, 332
- insurance, 724, 725
- investments, 622
- land use and transport planning,  
366-368
- licensing and parking changes, 370
- light duty vehicles, 326, 334,  
359-364, 365
- lightweight materials, 337-338
- mitigation potentials and costs,  
50-51, 325-326, 331,  
357-366, 632, 636
- mitigation technologies/strategies,  
49-51, 335-357
- mode shifts, 51, 348-351
- natural gas (CNG/LNG/GTL), 344-345
- non-CO<sub>2</sub> climate impacts, 331
- non-motorized transport, 350-351
- oil production peak, 325, 330-331
- overview/status, 48-49, 325-335
- policies and measures, 52, 326-327,  
366-380, 720-721
- projections, 325, 328, 330-335
- public transport, 51, 326, 329,  
330, 349-350
- rail transport, 51, 326, 351-352
- regulatory/operational  
measures, 371-372
- research and development, 327
- road transport, 50-51, 326, 328-330,  
336-351, 372-374
- shipping, 51, 52, 327, 335, 336,  
356-357, 375, 377-378
- size/weight of vehicles, 51, 329, 337
- subsidies, 378
- sustainable development, 379-380,  
720-721, 729
- taxation and pricing, 52, 326-327,  
368-371, 756
- Transport Demand Management  
(TDM), 52, 327, 374-375
- well-to-wheels analysis, 347-348, 349
- U**
- Uncertainty\***, 101, 131-134
- communication in this report,  
34, 131-132
- decision-making and, 33, 119,  
127, 128-129
- definition, 34, 132
- types of, 132-134
- United Nations conventions**, 525-526
- United Nations Framework Convention  
on Climate Change (UNFCCC)\***,  
31-32, 89, 97, 99-102, 112-113, 748
- Article 2 (ultimate objective), 32-33,  
97, 99-102, 112-113, 194
- Article 3, 129, 145-146
- Article 4, 750
- country groupings, 774
- implementation issues, 100-102
- Urban planning**, 720, 721
- V**
- Values\***
- decision-making and, 34, 127, 130
- discount rates, 136-138
- of non-market impacts, 130, 139
- of reduced risk, 134
- social value of damages, 232-233
- of technological innovation, 150-151
- Value-At-Risk (VAR), 134
- Volatile organic compounds  
(VOCs)**, 213-214, 676
- Voluntary actions\***, 32, 88, 791-795
- forestry sector, 569, 571
- industry sector, 62, 450, 480
- Voluntary agreements\***, 88, 747,  
750, 759-760, 761, 767
- buildings sector, 425
- industry sector, 62, 450, 479-480, 747
- Vulnerabilities**, 41-42, 141-142, 173, 230
- agriculture sector, 65, 500,  
522, 523, 532
- buildings sector, 56, 435-437
- energy sector, 46-47, 313
- forestry sector, 70, 543, 563-566
- industry sector, 61, 62, 450, 478
- interactions/relationships,  
141-142, 677-679
- linking emission scenarios to, 227-229
- waste sector, 612

**W****Waste fuels**, 458, 462**Waste management**, 71-76, **585-618**

adaptation-mitigation linkages, 612, 613

air quality issues, 607

biological treatment, 72,

601-602, 611, 728

carbon dioxide (CO<sub>2</sub>), 587, 589,

590, 595, 596, 599

carbon flows/storage, 589-590, 591, 592

CDM/JI, 72, 587, 597, 608, 609, 610

co-benefits, 75, 587, 588, 610, 612, 613

decoupling/dematerialization, 609

economic potentials, 73-74,

587, 605, 606

emissions from, 27, 29, 71, 72,

73, 105, 190, 587, 588,

590, 595-599, 639

fluorinated gases, 606, 609

incineration/thermal processes, 72,

73, 587, 588, 596, 599,

601, 607, 608, 728

landfills, 71-72, 73, 587, 588, 589,

595-596, 597-598, 600-601

long-term outlook, 76, 610-613

methane (CH<sub>4</sub>), 71-72, 587, 588, 589,

595-596, 597-599, 600-601

methane recovery, 71, 587,

600-601, 607-608

mitigation costs and potentials, 73-74,

589-590, 603-606, 632, 636

mitigation options and technologies,

73-74, 587, 599-603,

728, 732-733

nitrous oxide (N<sub>2</sub>O), 71, 587, 589,

595, 596, 598-599

NMVOCs, 607

overview/status, 71-72, 587-595

policies and measures, 74-75,

483-484, 587, 607-610

renewable energy, 71, 587, 588-589,

600-601, 607-608

rigid foams, 606

solid waste, 610-611

sustainable development, 587, 588,

609, 612, 613, 728, 732-733

technologies, 73, 75-76, 587,

599-603, 610-611, 612

vulnerability, 612

waste reduction, re-use and

recycling, 72, 587, 588,

591, 602, 609, 611, 728

waste-to-energy, 588, 601, 611

wastewater, 72, 74, 587, 588, 590,

592-595, 596, 598-599,

602-603, 611-613

**Wastewater**. *See* Waste management**Water quality**, agriculture and,

520-521, 732

**WEHAB (Water, Energy, Health,****Agriculture, and Biodiversity)****framework**, 124, 574, 696**Wind energy**, 43, 274-275, 297, 310**World Bank**, 32, 112, 722, 725, 780, 786**World Environment Organization****(WEO)**, 788**World Trade Organization****(WTO)**, 112, 526, 782

