Final Outlook Tables

Chapter 2: Atmosphere

Table 2.5 Progress towards goals (see Table 2.2)

A: Significant progress	**C:** Very little to no progress	**X:** Too soon to assess progress
B: Some progress	**D:** Deteriorating	**?:** Insufficient data
B/C:	B/D:	A/B:
C/D:	?/C:	D/C/B:
B/?:	C/D/?:	

Key issues and goals	State and trends		Outlook	Gaps
1. Stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system				
Climate change limit the increase in global average temperature to less than 2oC above pre-industrial levels	C	Rising CO2 and other greenhouse gas emissions, and increasing concentrations; SLCF concentrations remain high and some are increasing Temperature increases observed globally and regionally over last decades	Efficiency improvements and some progress towards meeting Kyoto targets Likely to breach the 2oC limit without further commitment and action	Improvement in monitoring and reporting of pledged actions; financial and technical support to developing countries; policy integration of climate change and other atmospheric issues
2. Protect the ozone layer by taking precautionary measures to control total global production and consumption of ozone-depleting substances (ODS) equitably, with the ultimate objective of eliminating them				
Stratospheric ozone depletion Zero consumption of ozone-depleting substances	**A**	About 98% achievement (in 2009) in reducing the production and consumption of substances covered by the Montreal Protocol Decreasing atmospheric concentrations Stabilization of the Antarctic ozone hole	Continued decrease in atmospheric concentrations of ozone-depleting substances; recovery of ozone layer by mid-century	Recovery and destruction of ozone-depleting substances; from equipment, chemical stockpiles, foams, and other products not yet released into the atmosphere
3. Reduce respiratory diseases and other health impacts resulting from air pollution, with particular focus on women and children				

Particulate matter (urban/ outdoor) WHO guidelines and national targets	B	Outdoor concentrations of particulate matter in most parts of Europe and North America are within or are approaching WHO and EU guidelines; concentrations in Africa and Asia remain high	Slow progress in developing countries in Africa and Asia, as any efficiencies are likely to be offset by increased consumption and levels of activity	Monitoring, mainly in developing countries; standards for particulate matter, political will and awareness of the issues in some developing countries
Particulate matter (indoor) Households cooking using biomass	C	In poor rural areas of the world, for example in parts of Africa and Asia, there is little access to cleaner cookstoves and fuels, and indoor particulate matter is very high; significant health impacts, especially for women and children.	Continued poverty and other barriers will prevent the transition to modern fuels or use of improved cooking facilities	Monitoring and associated technology in developing countries; mechanisms to enable purchase of efficient cooking stoves, institutional strengthening, and political will to address the issue
Tropospheric ozone WHO guidelines for health	B	Peak tropospheric ozone concentrations decreasing in Europe and North America except in ozone hotspots	Further reductions in Europe and North America will lead to decreased ozone, but there will be increases in precursors and ozone elsewhere	More ozone and precursor monitoring in developing countries; awareness of the issue
4. Enhanced cooperation at international, regional and national levels to reduce air pollution, including transboundary air pollution and acid deposition				
Tropospheric ozone CLRTAP goals	B	Peak concentrations of ozone are decreasing due to diminishing precursor emissions (nitrogen oxides, volatile organic compounds, methane and carbon monoxide) in Europe and North America except in ozone hotspots; increasing concentrations elsewhere; background concentrations increasing	Improvements in some regions are being offset by an increase in background ozone	Technology to minimize emissions of ozone precursors; monitoring in rural settings; implementation of policies in different sectors for different precursor emissions; regional and inter-regional cooperation
Sulphur dioxide WHO guidelines CLRTAP emission targets	B	Sulphur dioxide emissions and concentrations have been significantly reduced in Europe and North America	Overall sulphur dioxide emissions will decrease due to global desulphurization but increasing emissions are expected in some rapidly developing countries in Asia	Further sulphur dioxide emission reductions, especially in Asia

Nitrogen WHO guidelines CLRTAP emission targets	B	Nitrogen dioxide concentrations globally remained constant due to reductions in North America and Europe off-setting slight increases in Africa, Asia and Latin America	In Africa, Asia and Latin America where nitrogen emissions are not high priority, increases in both nitrogen oxide and ammonia emissions are expected, especially from agriculture and motorization	Awareness of issues and policy focus; improved technology to minimize emissions of nitrogen; understanding of long-range transport and impacts in all regions
5. Prevention of children's exposure to lead				
Lead Eliminate lead in petrol	A	Lead phased out in petrol globally except in six countries; lead blood levels in children have gone down	Lead from other sources, such as paint, has to be tackled globally	Policies and studies on lead in paint from developing countries

Chapter 3: Land

Table 3.5 Progress towards goals (see Table 3.1)

Key issues and goals	State and trends		Outlook	Gaps
1. Promote food security				
Reduce proportion of people who suffer from hunger	B	Proportion of malnourished people decreasing, but absolute number increasing	Depends on up-coming policy decisions and interventions	See following entries on increasing food production and access
Improve household economic access to food	C	Food per person is increasing overall, but a large gap remains between and within regions, particularly for rural poor households who now spend more than half of their income on food; one-third of food produced for human consumption is lost or wasted; land and food price volatility is influenced by rising demands for biofuels, among other economic forces	Drivers remain in place for land and food price volatility to continue; without interventions, the gap in food per person is likely to persist	Interventions to reduce post-harvest food waste; stimulate smallholder farmer-centred agricultural growth – promoting affordable access to land, water and tenure rights for poor households; coordinate domestic and regional biofuel policies to avoid worsening global food insecurity
Increase food production	C	Agricultural yields are generally increasing but a large gap remains between regions	Yields are unlikely to improve much more in developed countries; with efforts focusing on decreasing the yield gap in developing countries, much depends on how this is accomplished	Location-specific approaches to increase yields and achieve sustainable land use, for example smallholder farmer-centred agricultural growth; increased nutrient-use efficiency; improved temporal and spatial matching of nutrient supply with plant demand
2. Reverse loss of environmental resources				
Reduce deforestation rate and increase forest coverage	B	Slight slowing of deforestation but rate is still high; deforestation is concentrated in the tropics; temperate areas are experiencing some forest regrowth	Demand for timber and fibre is likely to rise; clearing for agricultural expansion, including biofuels, is likely to continue without a change in policies	Improved understanding of forest degradation; regional policy coordination to avoid leakage shifting deforestation from regulated to unregulated areas

Halt the destruction of tropical forests	B	Deforestation rate has slowed in some tropical countries, but net forest loss in Latin America and the Caribbean and Africa remains close to 7 million hectares per year	The area under the REDD+ programme and schemes for payment for ecosystem services is likely to increase, providing new incentives to protect tropical forests and their ecosystem services	Data and monitoring on carbon stocks/flux; number and area of community-managed REDD+ areas; national adaptation strategies
Stem the loss of wetlands	C/D	Continued conversion of wetlands for agriculture, aquaculture and human infrastructure	Pressure on wetlands is likely to continue or increase as demand for agricultural land and urban expansion continues	Improved inventory and monitoring of global wetlands; renewed commitment to the Ramsar Convention at the national level
Combat desertification and mitigate the effects of drought	C	Net primary productivity is decreasing in drylands	Pressure on drylands is likely to continue	Improved inventory and monitoring of global drylands
3. Practise integrated land-use planning and management				
Integrate principles of sustainable development into country policies and programmes	B	Good progress in countries affected by the UNCCD in establishing mechanisms to ensure synergy between conventions on desertification, biodiversity and climate change, but few countries have integrated investment frameworks	Depends on upcoming policy decisions and interventions	Greater integration/collaboration between sectors
Recognize, maintain and develop the multiple benefits of ecosystem services, for example for biodiversity, and for their cultural, scientific, and recreational value in addition to their economic value	C	Some examples of valuing multiple benefits of ecosystem services, but overall still largely externalized	Depends on upcoming policy decisions and interventions	Improved non-market valuation techniques; capacity building to include multiple and local values in land-use decision making

Chapter 4: Water

Table 4.3 Progress towards goals (see Table 4.1)

Key issues and goals	State and trends		Outlook	Gaps
1. Ecosystem				
Protect and restore freshwater ecosystems and their services	?	Half of countries have made significant progress towards developing and implementing integrated water resources management plans. It is unclear, however, how many reflect improved management of freshwater ecosystems. Many medium and large-scale dams have been constructed since 1990, especially in developing countries, disrupting the hydrologic regime integral to freshwater ecosystem function See Chapter 5	Pressure to build more dams and irrigation infrastructure will continue to be driven by increasing demand for energy and food	Global data on the state of freshwater ecosystems; quantifiable targets for ecosystem preservation and restoration from acute and chronic impacts
Protect and restore marine ecosystems and their services	D/B	D: Ocean warming and acidification is accelerating and stressing marine ecosystems, particularly coral reefs; 415 coastal areas are eutrophic of which 169 have hypoxic dead zones B: There are 18 regional seas conventions and action plans involving 143 countries that aim to improve ecosystem health, among other goals; 64 large marine ecosystems cover the world's coastal regions, some being effectively managed, while others lack funding and commitment of participating countries, resulting in slow progress B: See Chapter 5 regarding protected areas	Many tropical coral reefs could rapidly die by 2050 due to ocean acidification and warming; other significant threats to marine ecosystems include land-based pollution and lack of governance of high seas	pH target for oceans
Conserve and improve management of wetlands	D	See Chapters 3 and 5		
Ensure environmental water needs	D	Human water consumption jeopardizes ecosystems by utilizing environmental flows in nearly a third of major river basins	Expected to get worse as water demands increase	Data on monthly environmental flows required to maintain ecosystem services at the basin level; legal recognition of environmental water needs (Part 2); target to define and ensure that minimum environmental water

				requirements are met at the basin level; incorporation of environmental flows into basin allocation schemes
2. Human well-being				
Reduce water-related human health hazards	B	Increased access to improved water supply and sanitation has reduced water-related human health hazards globally and there have been notable successes in reducing some water related diseases; nevertheless, 3.5 million people still die each year from water-related diseases as of 2004; the frequency of paralytic shellfish poisoning has increased by a factor of five since 1970	Projected to continue improving access to water supply and sanitation. Africa projected to lag behind the rest of the world	Updated water-related disease and hazards data; mechanism for strict implementation of MDG at local scales
Ensure equitable access to improved drinking water supply	A/B	A: Population without access to improved drinking water supply has been reduced from 23% in 1990 to 13% in 2008 and is projected to be 9% by 2015B: More improvement has been made in urban than rural communities, leaving large inequities in access; the reliability and quality of water supplies are of concern in many areas	Population without access to improved drinking water supply is projected to be 9% by 2015, meeting the related MDG	Data on safe (not just improved) drinking water access by region; mechanism for strict implementation of MDG; agreed definition of equitable
Secure adequate and sustainable freshwater supply	D/B	D: Global water withdrawals have tripled over the last 50 years to meet increasing demands, with groundwater particularly at risk; 80% of people live in areas with high levels of threats to water security, including 3.4 billion people in the most severe threat categoryB: Construction of dams is improving access to freshwater supply in many developing countries	More people are likely to experience more severe water stresses in coming decades; planetary boundaries for freshwater use are expected to be reached in the coming decades	Water security metric defined and data developed to allow tracking of trends over time (groundwater recharge; global withdrawals and consumption from the energy sector; global overlays of water scarcity and demand from energy); agreed definition of water security and related metrics
Develop programmes for mitigating the effects of extreme water-related events	B/D	B: Many governments report major progress towards implementation of disaster risk reduction strategies D: The number of drought and flood disasters increased by 38% and 230% respectively from the 1980s to the 2000s, while the number of people exposed to floods increased by 114%	Increased precipitation intensity and aridity is expected to accentuate extreme water-related events in many parts of the world	Holistic cost-benefit analyses of various adaptation and mitigation measures and impact analyses of mitigation efforts; policy integration, both horizontal (e.g. between sectors) and

				vertical (e.g. from global to regional to local); risk management strategies for vulnerable communities
Mitigate and adapt to adverse effects of climate change on the water environment	B/C	B: Broad adaptation tools, scenario-based approaches and adaptive management are being formulated at multiple scales; planned interventions in the water sector can be also be found in national adaptation programmes of action (NAPAs) of the least developed countries; 35% of World Bank water projects during 2006–2008 included mitigation and adaptation measures for climate change C: The costs of adapting to climate change are additional to those required to meet current MDG targets on water and sanitation, which are themselves underfunded	As scientific uncertainty is reduced at regional and local levels and awareness increases, mitigation and adaptation measures are expected to increase; climate change adaptation costs for the water sector and sea level rise will be at least US$35–100 billion per year	Reporting of mitigation and adaptation outcomes; monitoring and early warning for water-related climate extremes; long-term observatories for monitoring changes to the hydrologic cycle as a result of climate change
3. Water use efficiency				
Improve the efficient use of water resources	B	Irrigation efficiency is poor in many regions; irrigation technologies have become more efficient but have not been widely applied; some efficiency improvements have occurred through virtual water trade	The rate of implementation of water efficiency is not on track to keep pace with growing demand; virtual water trade could help efficiently redistribute water	Water resource efficiency trend data by sector (including energy sector) and country; virtual water trade trend data; efficiency impacts of virtual water trade; quantitative efficiency targets by sector; water allocation efficiency including environmental flows
4. Water quality				
Reduce and control freshwater pollution	?/C	No global datasets of freshwater quality have been available to assess overall trends; there have been some local water quality improvements but faecal coliforms in at least parts of most major river systems exceed WHO standards for drinking; gross algal and macrophyte productivity in lakes has increased by 74% globally	No outlook data identified	Global and regional data on sediment, nutrients, marine litter, toxic chemicals and emerging contaminants; rigorous global and regional water quality index based on comprehensive long-term data; water quality standards and targets for

				emerging contaminants
Reduce and control marine pollution	D/C/B	D: At least 415 coastal areas with serious eutrophication. Global nutrient run-off increased by approximately 15% since 1970. C: No statistically significant changes in the quantity of coastal or marine litter, although data are scarce for many regions B: Reduction of many contaminants in fish tissue; notable recent contamination events include the Fukushima nuclear crisis in Japan and the Deepwater Horizon oil spill in the Gulf of Mexico	Nitrogen loads to oceans are projected to increase from 43.2 million tonnes per year in 2000 to 45.5 million tonnes per year in 2030	Global and regional data on sediment, nutrients, marine litter, toxic chemicals and emerging contaminants
Improve sanitation coverage, including sewage collection, treatment and disposal	B	The population with access to improved sanitation increased from 54% to 61% during 1990–2008, though improvements are bypassing the poorest and most rural communities; 2.6 billion people (1 in 2.5) were without access to improved sanitation in 2008	Not globally on track to meet the MDG target of halving the proportion of people without access to improved sanitation	Water security metric defined and data developed to allow tracking of trends over time (groundwater recharge; global withdrawals and consumption from the energy sector; global overlays of water scarcity and demand from energy); agreed definition of water security and related metrics
5. Institutional and legal				
Recognize the economic value of water	?	See Chapter 5 for discussion of ecosystem services; Chapters 10, 11 and 12 give examples of water pricing schemes and market-based solutions that reflect the value of water and aquatic ecosystems	No outlook data identified	Data on scope, magnitude and value of water-related ecosystem services (e.g. value of wetlands as buffers against extreme events); goals and targets recognizing, protecting and valuing ecosystem services for human and environmental health and well-being
Develop and enforce legal frameworks and regulations	B	UNCLOS was ratified by 160 countries and the Global Programme of Action (GPA) adopted by 108 countries; legal frameworks for industrial and municipal wastewater discharge exist in most developed countries although non-point-source regulations lag behind; governance of areas beyond national boundaries is weak and fragmented; enforcement remains an issue	No outlook data identified	Capacity to effectively assess and regulate environmental impacts beyond national jurisdictions

		in many regions.		
Strengthen institutional coordination mechanisms	B	Two-thirds of transboundary water-related events are cooperative, although the number of water conflicts has increased since the 1970s; 295 international water agreements have been signed since 1948; less than 20% of the 106 basins with water institutions have multilateral agreements in effect; 143 countries participate in 18 regional seas programmes, and the large marine ecosystem approach has delineated 64 management units globally	No outlook data identified	Metrics of coordination effectiveness
6. Water resources management				
Develop and implement integrated management strategies and plans	B/?	There has been an increased recognition of the need for integrated approaches for freshwater and marine system management; about half of countries have made significant progress towards developing and implementing integrated approaches to water resources management and water efficiency, but the 2002 WSSD target is far from being met; implementation is slowed by financial, legal and/or capacity barriers; there is insufficient data to evaluate the long-term effectiveness of integrated water resource management	Developing countries in particular will face difficulties implementing integrated management approaches due to lack of funding, capacity and governance	Reporting mechanism and meaningful governance indicators for countries' progress towards integrated water resources management, including the effectiveness of such approaches; implementation of policy goals
Develop adequate monitoring systems (national, regional and global)	C/D	Data is fragmented, lacks complete global coverage or is not regularly updated; marine monitoring and remote sensing data acquisition has increased, but global freshwater monitoring has declined and is now inadequate; modelling and remote sensing are complementing monitoring in many instances, but still rely on adequate data	Comprehensive monitoring systems will continue to be limited by financing and capacity	Metadata on existing data; agreed quantitative targets on comprehensive monitoring and reporting systems
Improve stakeholder participation and mainstream gender in water management	?	No quantitative global data is available to assess this goal; stakeholder engagement and gender mainstreaming is becoming more common globally, but is still lacking in many regions	No outlook data available	Data to assess stakeholder participation, including roles of women and men, and separating data by sex; institutionalized stakeholder participation; systematic gender impact assessment
Improve groundwater management	C/D/ ?	C: Arsenic and nitrates threaten aquifers in many countries D: Many aquifers are being drawn down at unsustainable rates; efficient management requires more data for quantitative assessment of the problem ?: Transboundary groundwater systems have been largely ignored	No outlook data available	Global level datasets on groundwater contamination, availability and withdrawal; transboundary management

		due largely to insufficient data and lack of agreement		of groundwater resources (precluded by the data gap)

Chapter 5: Biodiversity

Table 5.2 Progress towards goals (see Table 5.1)

Key issues and goals	State and trends		Outlook	Gaps
1. Reduce the direct pressures on biodiversity *(Notes 4, 6, 7, 13; CBD Targets 5–10)*				
Drivers of habitat loss and degradation	C	Continuing increases in pressures from, for example, agriculture and infrastructure development	Increasing pressure	Quantification of trends in habitat extent and condition resulting from different drivers
Levels of exploitation	C	Significant proportion of species is threatened by overexploitation; legal international trade is successfully managed for a small number of species	Increasing pressure	More systematic measures of exploitation levels, particularly at local/national scale, including illegal trade
Spread and impact of invasive alien species	B/C	Numbers and extent of invasive alien species are increasing where quantified; impacts have been successfully mitigated and the spread limited in some cases	Continuing spread and impact, with local exceptions	Numbers/impacts in developing countries, policy implementation and effectiveness at local/national scale
Pressure from pollutants	B	Generally increasing pressures from pollution, but nitrogen deposition since the 1990s may be levelling off	Increasing pressure, with local exceptions for certain pollutants	Trends in levels of pollutants other than nitrogen
Impacts of climate change	C	Increasing impacts on phenology, abundance, distribution and community composition in all ecosystems	Increasing pressure	Impacts on population trends and interactions with other threats
2. Improve the status of biodiversity *(Notes 1, 2, 3, 4, 7, 8, 9, 11, 12; CBD Targets 11–13)*				
Genetic diversity of wild species	?	Genetic diversity of cultivated crops and domesticated animals has declined and, while un-quantified in wild species, is likely to be declining	Continuing decline	Data collection on genetic diversity of wild populations
Population abundance of species	C	Declining at the global scale, most rapidly in the tropics, freshwater habitats and for utilized marine species; there are some exceptions due to effective conservation action, for example North American waterbirds	Continuing decline	Trends for plants and invertebrates; tropical coverage patchy; systematic monitoring largely confined to birds in developed countries
Extinction risk of species	C	13–63 % of species in different groups are threatened with extinction; trends, where known, are declining (most rapidly for corals)	Continuing decline	Trends for plants, invertebrates and remaining vertebrate classes; national scale extinction risk trends

Extent, condition and integrity of biomes, habitats and ecosystems	C	Declines in all natural habitats with known trends, for example forests, mangroves, seagrasses and coral reefs; some exceptions, for example reforestation in some temperate countries	Continuing decline	Consistent and repeated remote-sensing monitoring, including for non-forest areas; metrics of condition and fragmentation
3. Enhance sustainable benefits (ecosystem services) from biodiversity *(Notes 1, 2, 3, 4, 9, 11, 12; CBD Targets 14–16)*				
Status of species harvested for food and medicine	C	Extinction risk trends are worse for species harvested for food and medicine than for other species	Benefits currently unsustainable and likely to decline	Trends for plants and invertebrates; disaggregation of all data into small-scale subsistence use or large-scale and/or commercial use
Equitable use of natural resources	C	For some countries the per-person ecological footprint is high and/ or increasing relative to life expectancy, indicating inefficiency and often unsustainability in resource use	Potential for the global ecological footprint to be reduced while enhancing human well-being, requiring major adjustments in benefit sharing	Suitable data for footprint analysis, including spatial and temporal resolution data on the intensity and magnitude of natural resource use at global level
4. Strengthen responses to safeguard biodiversity *(Notes 1, 2, 3, 4, 6, 7, 8, 9, 10, 12, 13; CBD Targets 1–20)*				
Extent, biodiversity coverage and integrity of protected areas	B	Terrestrial coverage has reached nearly 13%, but marine coverage is less than 1.5%; representativeness at the scale of ecoregions is fairly high, but the proportion of fully protected key biodiversity sites is low	Protected area extent is likely to increase if governments fulfil their commitments; more careful site selection and better management will be required to protect biodiversity; jurisdictional uncertainties and conflicts need resolution	Data on trends in the effectiveness of protected areas and on jurisdictional uncertainties and conflict
Extent, biodiversity coverage and integrity of indigenous and community-conserved areas (ICCAs), sacred natural sites (SNSs) and other community-managed natural areas	B	Community-based governance and management approaches exist largely without state recognition or are newly developing; external drivers of biodiversity loss and/or other factors undermine the capacity of ICCAs, SNSs, and other such areas to conserve biodiversity	Likely to increase in importance; empowerment of local communities in decision making is needed, plus greater awareness amongst government protected-area officials	Data on the location, extent, legal status and effectiveness of these areas for biodiversity conservation; possible forms and modes of appropriate state recognition and support

Schemes such as REDD+ or payment for ecosystem services (PES), where biodiversity supports mitigation of, and adaptation to, climate change	B	The development of REDD+ and PES schemes is increasing	The area under REDD+ and PES schemes is likely to increase, providing both opportunities and potential threats for biodiversity conservation	Potential indicators such as number and area of community-managed REDD+ areas or number of national adaptation strategies with ecosystem-based components
Proportion of sustainably managed production areas	C	Area certified as sustainably managed increasing, but the proportional area remains minimal, with an uneven global distribution	Area of certified production increasing, especially in developed countries	Effectiveness for biodiversity conservation; impacts of these approaches in non-certified areas
Policy responses addressing invasive alien species	B	Proportion of countries with relevant legislation increasing, but implementation and transboundary cooperation are poor	Policy responses increasing but ineffective without considerably improved implementation	More data needed on implementation and effectiveness
Action for species recovery, site safeguarding and habitat restoration	B	Numerous local examples show that successful conservation programmes prevent extinctions, restore habitats and conserve sites; however, the scale of these efforts remains inadequate	Improvements in coordination and integration are expected, but on their own will remain insufficient	More data on species recovery and restoration needed
Number of countries with national mechanisms addressing access and benefit sharing	B	Agreement of Nagoya Protocol on access and benefit sharing is a significant step forward, with increasing numbers of signatories and countries with relevant legislation	Implementation of the Nagoya Protocol could address this issue effectively	Data required on access and benefit-sharing agreements and beneficiaries, and on the benefits and sustainability of utilizing genetic resources
Number of languages and speakers as a proxy for traditional knowledge supporting sustainable resource use and conservation	C	Number of languages and speakers is declining, suggesting less traditional knowledge in support of sustainable use and conservation	Appropriate mechanisms, including support for customary sustainable use of biodiversity and secure tenure, may help to halt the decline in traditional knowledge	Indicators to capture intergenerational transfer of traditional knowledge and provision of incentives; indicators on the retention of traditional knowledge to assess social-ecological resilience

Chapter 6: Chemicals and Wastes

Table 6.4 Progress towards goals (see Table 6.1)

Key issues and goals		State and trends	Outlook	Gaps
1. Provide sound management of chemicals throughout their life cycle and of waste				
Sound management of chemicals	B	17 multilateral agreements are in place and over 300 activities have been conducted under the SAICM Global Plan of Action; 23 countries have a functioning national chemical register; a globally harmonized system of classification and labelling of chemicals has been established	The number of developing countries implementing sound chemicals management is increasing	Strengthening of the life-cycle approach; a more integrated global framework for risk assessment and risk management of chemicals; plans for the implementation of sound management of chemicals, most notably for developing countries heavily involved in the production, trade and use of chemicals, particularly in Asia and the Pacific and Latin America
Sound management of waste	B	Objective standards of environmentally sound waste management are not optimal; practices vary widely according to local norms and conditions; cities face increasing problems with management of municipal waste, poor monitoring and open burning, and illegal traffic in waste	Waste production will increase according to current trends in consumption and trade	Data on waste
Improve resource efficiency	C	Efficient ways of transforming waste into energy, applicable in developing countries, are lacking	Environmentally sound energy recovery will benefit some situations if balanced with emphasis on waste recovery for reuse and recycling rather than competing with energy solutions	Technology transfer and capacity building for the long term to ensure the performance of any facility is maintained

Key issues and goals	State and trends		Outlook	Gaps
Prevent and minimize waste by maximizing reuse, recycling and environmentally friendly alternative materials	?	Many initiatives and some regional and national programmes exist, including Reduce, Reuse, Recycle; EU Producer Responsibility Directives; Basel Mobile Phone Partnership; and Basel Partnership Action on Computer Equipment	Potential to raise many of these efforts to a global level	Global measurement methodology and data on waste minimization; reliable data and trend information
Strict control of the generation and management of hazardous and other waste	?	Data from national reporting to the Basel Convention Secretariat is sparse and difficult to interpret; reporting by Parties is declining	Trend may continue if Parties are not supported in improving compliance and changing direction	Additional effort on awareness raising and capacity building
2. Protect human health and the environment from POPs				
Eliminate or restrict the production, use, import and export of POPs	B	Some progress, but it is still too early to evaluate headway on the basis of the indicators; long-term records show a decrease in atmospheric POP concentrations during the 1980s and 1990s, but trends have levelled off since 2000; in urban regions of Western industrialized countries PCB emissions are ongoing and of the order of 0.1–1.0 gram per person per year	Continuing exposure to POPs in all parts of the world is likely; climate change may increase exposure due to greater mobilization of POPs	Support to developing countries for their national implementation plans under the Stockholm Convention; greater attention to DDT exposure from malaria control, and exposure to polybrominated diphenyl ethers (among other chemicals) from handling e-waste
3. Reduction of the risks posed by heavy metals				
Restrict production and use of heavy metals	B	Progress in developed countries has resulted in a less frequent occurrence of acute toxicity, but exposure still occurs at industrial and legacy sites, and there is increasing concern regarding possible subtle developmental effects of chronic, low-level exposure; significant problems remain in developing countries, where heavy metals are often mined, processed, used and recycled with limited control, and where	Ongoing global negotiations on mercury are positive, and further efforts are required to include heavy metals (lead, cadmium, arsenic) in international agreements	Additional research into alternative, more benign chemicals for use in consumer goods to help reduce the heavy metal burden to the environment; more stringent occupational, human health and environmental standards

Key issues and goals	State and trends		Outlook	Gaps
		most cases of acute toxicity occur, particularly for lead, mercury and arsenic		
Restrict import and export of heavy metals, and waste containing heavy metals	B	The rapid turnover of e-products and high cost of eliminating the hazardous substances within them have led to growth in the trade and movement of e-waste to developing countries where labour costs and health and environmental standards are lower	EU directive on the restriction of certain hazardous substances in e-waste is a positive step; global initiatives are also required	Global initiatives such as that on mercury would be beneficial
Improve waste disposal techniques for waste containing heavy metals		Much controlled disposal takes place in developed countries, but work is still needed in many developing countries to improve disposal following mining, smelting, battery and e-waste recycling	Internationally agreed goals for lead, mercury and possibly other heavy metals exist or are in development; further efforts are required	More stringent occupational, human health and environmental standards, as well as more stringent regulations surrounding disposal
4. Promote shared responsibility and cooperative efforts between Parties in the international trade of certain hazardous chemicals				
Develop national decision-making processes for the import and export of hazardous chemicals	C	Many developing countries lack policies on sound management, with weak institutional and regulatory frameworks and poor enforcement of existing laws; there is no coherent approach for national decision-making, with a multiplicity of government agencies having mandates for the import and export of hazardous chemicals, causing jurisdictional conflict and weakening decision-making	Foreseeable improvement if the rate of notifications under the Rotterdam Convention continues or is enhanced	Improvement of mechanisms, governance and a regulatory framework for effective decision making at regional and national levels, including promoting synergy in the implementation of international chemical and waste agreements
Facilitate information exchange about chemical characteristics	?	There is a lack of datasets and effective mechanisms available to national, regional and international stakeholders for the retrieval and dissemination of information about chemicals' characteristics; poor information exchange between government agencies at the national level is hindering informed decision making		Development and implementation of functional international, regional and national networks for the exchange of information on the characteristics of hazardous chemicals and wastes
5. Use transparent science-based risk assessment and risk management procedures				
Sound management of chemicals	?	Risk assessment is being used at the international level (Stockholm Convention), but is constrained in developing countries by the	The situation may improve through the activities of the convention review committees, the intergovernmental	Data on children's vulnerability to chemical risk (average risk assessment only uses adult data); training in chemicals identification and risk

Key issues and goals	State and trends		Outlook	Gaps
throughout their life cycle		lack of data on exposure and effects caused by chemicals and wastes, and also by capacity constraints Under the Montreal Protocol, training has been provided for ozone officers to detect illegal shipments; the Globally Harmonized System (GHS) for labelling of chemicals in the workplace is hazard-based and can be used as input to risk assessment There is uncertainty about both the hazardousness of certain chemicals and the risk they pose; chemicals in products are often not identified, sometimes for reasons of commercial confidentiality	process on mercury, EU REACH and national reassessments of chemicals	management under the auspices of SAICM; disclosure of product composition
Encourage research in order to prevent, eliminate and reduce pollution of the marine environment	A	Historically, investment in marine pollution research has been more active in the northern hemisphere; more recently, important efforts are being made in the developing world to protect marine resources – often an important food source – from pollution		Scientifically sound data on contamination
6. Develop adequate monitoring systems (national, regional and global)				
Develop sound science-based monitoring programmes	?	For POPs, the Global Monitoring Plan is in place; for a wide range of additional chemicals, biomonitoring programmes are inadequate in most countries and human exposure is incompletely documented; hazardous waste reporting systems are available for Parties to the Basel Convention but are not fully taken up or reported; the impacts of waste due to unsound disposal are difficult to quantify	Global monitoring programmes involving chemicals are being developed and harmonization and global coverage are expected to be reached in the coming years	Comprehensive regional and global monitoring programmes for building spatial and temporal trends of key chemicals and wastes, as well as datasets and indicators to enable monitoring of change; biomarkers and bioindicators to assist the assessment of chemical exposure and effects; training and appropriate laboratory facilities in developing countries, and support to build capacity for monitoring hazardous residues imported from developed countries (storage, disposal or

Key issues and goals	State and trends		Outlook	Gaps
				reprocessing)
7. Capacity development				
Sound management of chemicals and hazardous wastes	C	In spite of efforts by international agencies, capacity development for sound management in developing countries is still lacking; Basel and Stockholm Convention Regional Centres have been established to enhance the capacity of governments and stakeholders in developing countries, but adequate financing mechanisms are not yet in place	Situation likely to improve if Stockholm and Basel Conventions, SAICM and the GHS can be supported through innovative financing mechanisms	An adequate financing mechanism, as well as information and knowledge sharing between north and south
Improve resource efficiency	B	Waste disposal rather than integrated waste management is practised without resource and materials recovery, and national waste policy and legislations on integrated waste management as well as infrastructure for collection are inadequate; crude and resource-inefficient recycling exists in the informal economy	Environmentally sound management of waste instead of indiscriminate disposal and uncontrolled open burning	Promotion of regional and national initiatives on waste-to-energy and waste-to-organic-fertilizers, along with waste recycling and materials recovery through pilot/demonstration projects
Control of transboundary movements of hazardous waste	?	The control system available via the Basel Convention's prior informed consent notification process can work very well when fully utilized, though the process is vulnerable to circumvention and illegal traffic	Full national implementation of the Basel Convention and measures under SAICM, along with further stimulus, would improve the rate of progress	Improved capacity building and funding mechanisms to sustain implementation and compliance of the Basel Convention; elaboration of synergistic convention initiatives at the regional and national levels; improved cooperation between international, regional and national networks for controlling the transboundary movement of hazardous waste Greater cooperation, for example through the European IMPEL and global INECE networks, to improve compliance and enforcement, together with Interpol Pollution Crimes Working Group initiatives; better reporting as well as active collaboration and cooperation with Basel Convention focal points in developing countries

Key issues and goals	State and trends		Outlook	Gaps
8. Protect and preserve the marine environment from all sources of pollution				
Pollution from ships	B	Progress has been made under the MARPOL Convention – 150 countries have ratified although many are yet to comply; control of greenhouse gas emissions from international shipping, and a draft of the reduction mechanisms themselves are under further consideration by the International Maritime Organization's Marine Environment Protection Committee (MEPC)	Likely to improve with the development of new mechanisms under MEPC	Development and implementation of functional international networks for the control of ships' wastes, including disposal facilities in ports
Protect the marine environment	X	Protection of the marine environment has not always been given priority by institutional arrangements or by environmental regulations in developing countries; UNEP's regional seas conventions have not all been transposed into law or implemented; many countries have not ratified or implemented MARPOL; the level of coastal and marine pollution continues to increase, with a lack of control of land-based sources of pollution at the regional and national levels; unsustainable exploitation of marine resources and the marine environment is widespread	Mixed	International action to promote the ratification, transposition into national law and implementation of MARPOL, the regional seas conventions and the London Convention at the regional and national levels, as well as to develop multilateral agreements on chemicals and waste
9. Radioactive waste management and safety				
Ensure that radioactive wastes are safely managed, transported, stored and disposed of	B	Radioactive waste from the operation of nuclear facilities and uses of radioactive material in medicine, industry and research are generally controlled according to international standards and reported at meetings of the Joint Convention on Spent Fuel and Radioactive Waste; some legacy sites remain from nuclear weapons production and testing; some uranium mining legacy sites remain in Africa and Central Asia	Radioactive waste will continue to be generated by the nuclear industry, medical and industrial uses and mining and mineral exploitation, with elevated levels of naturally occurring radionuclides; management and disposal facilities will be needed in the foreseeable future	A closer link between the Joint Convention (already an important global instrument for safe management of radioactive waste) and other international instruments on hazardous materials to develop beneficial synergies; support for international efforts to assist with remediation of uranium mining legacy sites

Key issues and goals	State and trends		Outlook	Gaps
Prevent accidents with radiological consequences and mitigate consequences of accidental releases	B	The Fukushima accident illustrates that nuclear accidents can still occur despite improvements since Chernobyl, and the Convention on Nuclear Safety (sister convention to the Joint Convention) is intended to ensure countries maintain a high level of safety	A number of countries have decided to phase out their nuclear programmes following the Fukushima accident while others continue to develop their programmes; it is too early to say what the overall impact will be	More emphasis to ensure that the objectives of the Convention on Nuclear Safety and the Joint Convention are achieved