# IAC Perspectives on the Future

In January 2004, members of EPA's Innovation Action Council (IAC) stressed the need to incorporate futures thinking into strategic and regional planning. To further elicit their views about the environmental future, the Office of the Chief Financial Officer's (OCFO) futures team, with significant input from the Agency's Futures Network developed a set of 7 open-ended interview questions that aimed to identify the key environmental trends EPA will be facing by 2011 and 2025, the drivers and assumptions behind these trends, and policies and practices EPA should implement to address emerging challenges.

23 IAC members were interviewed during the spring of 2004. 18 self-selected staff from the EPA Futures Network responded to the same set of questions through an email survey. A copy of the survey, accompanying background documents and information about the data analysis are included in the appendices at the end.

This summary of the interview results is one part of a larger effort to incorporate futures thinking into the Agency's strategic and regional planning processes. The views of the future expressed in these interviews provide context and guidance for Agency strategic and regional planning.

During the interviews, both IAC members and staff respondents shared ideas about emerging environmental problems and considered their implications for EPA's traditional roles and responsibilities. The interview summary uses direct quotes from IAC and staff respondents* to address 3 basic questions:

- What **Emerging Problems** will be the most serious threats to the environment?
- What are **Underlying Causes** of these problems?
- What **New Strategies** should EPA use to address these problems and causes?

* Unless specifically indicated by the word "staff," all responses were taken from IAC interview transcripts. Staff responses are only included to reinforce opinions expressed by IAC interviewees.

## 2 Emerging Problems

Respondents were primarily concerned with complex, international issues. Almost all of them mentioned global water scarcity and unsustainable resource consumption as key threats to environmental quality. Several comments about climate change and transboundary air pollution also indicate growing recognition of impending changes to EPA's traditional concerns.

Figure 1 provides a brief summary of key topics mentioned by IAC and staff respondents.

**Figure1. IAC vs. EPA Staff**

The following comparison of IAC and staff responses contains the most frequent issues mentioned in answers to question 1. This question asked respondents to identify key emerging trends relevant to their current role and responsibilities

| IAC | Staff |
|---|---|
| 1) Water quality & demand | 1) Water quality & demand |
| 2) Climate change | 2) Energy production |
| 3) Global air pollution | 3) Biodiversity |
| 4) Energy Production | 4) Toxic chemicals |
| 5) Biodiversity & Homeland Security | 5) Climate change |

**Water Quality and Demand**

*"Water quality and quantity are becoming more prominent issues, including the implications of diminishing groundwater and recurring drought cycles. Some experts predict that—while civilization has a history of waging war over fossil fuels—going forward, wars will be fought over water. This is an international, a national and a local issue."*

*"Much of the municipal wastewater management infrastructure is crumbling…a significant area is how to balance the need to treat wastewater and discharge it appropriately to meet water quality standards when cities aren't able or willing to increase their taxes or user fees."*

*"Recent information tells us that territories and tribal nations are more likely than not to have drinking water that doesn't meet EPA standards."*

*"If we don't deal with the water demanded by our growing population, the agricultural sector of the region will really be hurt. There are erosion implications if we lose agriculture without getting soil cover established on lands taken out of production. Dust bowl circumstances could reoccur. We are also not replenishing our deep aquifers."*

**Climate Change**

*"By 2025 we should be able to tell if the current increase in global temperatures is continuing and beginning to show negative results, or if it was a short term trend that has been reversed. We should start research now into sea level rise, changes in estuary boundaries, and other predictable results of a prolonged warming." (Staff).*

*"In the longer time frame our focus should be towards climate change concerns. There is adequate knowledge at this time to know that we should be investing in this area."*

*"Looking out to 2025, the biggest concerns seem to be **climate change and other global pollution issues** …. We'll need to work collaboratively with other governments to address these."*

**Global Air Pollution**

*"We may be out of the air toxics business, but we'll have to deal with PM (particulate matter) for a long while. Transpacific pollution transport is and will be a major contributor to PM pollution on the West Coast. China and the Asian economy are important to watch. Also, recent study showed Florida getting PM pollution from the Sub-Sahara."*

*"Air Issues such as, PM from China and India, and SE Asia currently affect Southern California and Mercury deposition. These are long-term because we have little control over the major remaining sources and the outlook is daunting"*

*"Looking out to 2025, the biggest concerns seem to be global pollution issues (mercury, PCBs, dioxin—these substances that are showing up in every corner of the world."*

**Energy Production & Alternative Energy**

*"Energy may be the most immediate problem…we will begin to experience more pollution from energy usage by 2011 unless technology for coal-cleaning and renewable energy develops much faster than it is now."*

*"There has been a great deal of controversy around energy production in areas that have prime environmental value…how we can balance the need for [energy] resources with environmental concerns?"*

*"There will be growing pressure on energy and water resources, plus significant urban air quality degradation issues in the regions of the Southwest and Southeast."*

*"Population will continue to increase and energy and water resources will be harder to find."(Staff)*

**Biodiversity**

*"I really believe that habitat destruction with the accompanying extinction of species (plant and animal) is a challenge we have only begun to face. We are currently dealing with it only on the margins." (Staff)*

*"By 2011 the SE, like a number of other parts of the country, will experience continual urban sprawl. The demand for second homes along the coast, in especially fragile areas, is and can be very damaging to coastal ecosystems. The demand for second and vacation homes in the mountains is fragmenting an already fragmented forest in the SE."(Staff)*

*"Oil & gas exploration in wilderness areas (particularly in R8) given shortages in energy sources will put an increased demand on doing more Environmental Impact Statements. We will need accurate assessment of impacts for these new sources of energy."*

*"Ocean Resources will continue to be a gigantic challenge. The science needs to improve as well as the regulatory approaches." (Staff)*

*"On a national level, as our fisheries decline people are becoming more acutely aware of the environmental impacts we are having on fish."*

**Homeland Security**

*"One reliable pattern that we fail to take into account is the outbreak of war – every 5-6 years. EPA should anticipate both the "frank" adverse effects on the global environment and also the influence that a "war economy" has on domestic economic trends (e.g., the ongoing "mobilization" of otherwise-marginal industrial sectors, postponing necessary pollution-abatement measures)."*

*"New program challenges from which workforce needs may arise: terrorism – unknown now – could grow as problem, or not – Agency role and size of problem will affect workforce used to address problem."*

**Toxic Chemicals**

*"With regard to toxic chemical releases, we recently began an investigation of PVC facilities and the chemicals emitted from PVC production, which are known carcinogens. We weren't able to determine compliance in the traditional way using basic inspections because many of the emission sources were not readily identifiable as being in compliance."*

*"A final concern is the proliferation of untested chemicals with unknown properties and effects on our world (particularly PBTs). We still don't think ecologically; it's compartmentalized reductionism."(Staff)*

*"Toxics—new substances being developed without enough knowledge of their impacts on human health and the environment." (Staff)*

**Indoor Air Quality**

*"New concerns like Homeland Security will also drive EPA to look more closely at indoor issues as will the developing concern over Green Buildings which as yet do not have an indoor air component. By [2025], the CAA will specifically acknowledge the importance of indoor air."*

*"…growing awareness of the multiplicity of harmful substances present in our indoor environments. While some of these arise from natural causes (mold, mildew, etc.) many are produced as synthetics from the manufacturing processes of our floor coverings, wood products, paints, ceilings, draperies, upholstery fabrics, dyes and adhesives."*

## 3 Underlying Causes

IAC descriptions of environmental problems were frequently tied to observations about EPA policy choices. Staff focused less on EPA's role and more on external drivers and trends. Demographic trends and behavior were the most frequently cited drivers for the environmental problems outlined in Section 3. Policy decisions were also mentioned frequently. In some cases, respondents demonstrated significant disagreement on key issues; Figures 2 - 6 highlight differing views related to demographic trends, EPA policy, and emerging technologies.

**Changing Demographics**

Urbanization in Developing Countries

"*Pace and magnitude of development in undeveloped countries (particularly China, India, and Russia) will result in a significant environmental footprint, that will dwarf developed countries."*

*"In 20 years growth of China's population & economy will pose great impacts on world environment."*

*"The rapid urbanization of future populations is of particular concern. We are already seeing this trend, for example, in China where, in order to provide electricity, China is building the world's biggest dam, which is relocating many, many agricultural village populations into unfamiliar and stressful urban scenarios."*

**Figure 2.**
**Differing Perspectives – Population Growth**

The rate and pattern of consumption around the world is the most pressing problem. Population growth and concentration creates large areas, cities and even countries that are not sustainable.

VS.

I would say that people inside of EPA are doing no thinking about demography. Assumptions are based on a Malthusian growth curve when in fact we're topping off in the 2020 timeframe. It's actually the carrying capacity we need to worry about. Sustainability means finding the ability to not exceed the carrying capacity.

A number of unpredictable events could [prevent dramatic population growth], e.g., global pandemic, wide-spread wars involving WMD, application of draconian population control measures in certain societies, collapse of the global food production system. (Staff)

Immigration

"*Until other countries economies can provide a level of employment for their populations, we will see increased immigration into our country. This is a sustainability issue for us and them. This level of immigration to the US results in domestic money diverted from environmental issues to social issues. Mexico experiences both lost manpower and income (through tax opportunities), both of which are needed to elevate Mexico's standard of living and economy."*

*"The increasing Spanish-speaking population will pose environmental education problems. This will be a communication challenge, particularly with cultural aspects, such as, lead in pottery, local remedies, and nutrition and exercise regimes."*

Politics

*"By 2011 we could see major ramifications of the drought, with water transfers away from population centers in Colorado in order to meet downstream water rights."*

*"Water allocation [in western US], may lead local constituencies to use environmental issues to avoid losses of water (e.g., interbasin water transfers) or otherwise challenge embedded assumptions and interpretations of EPA, state, and other governmental authorities. These battles over natural resources are likely to be complex, multi-agency, and protracted."*

**Figure 3.**
**Differing Perspectives - Aging**

Looking at real estate transactions will give you a good idea of where the aging baby boomers and retirees are moving: waterfront properties, golf courses. Conduct a retrospective study and see the trends. Look for senior communities and chart the trends. Environmental accommodation of the aging population is going to be a problem.

VS.

We don't know how to integrate demographic information. For instance the Aging Initiative considers the ecological consequences relative to the proliferation of golf courses. We're not on top of the trends in terms of migration of older Americans. The rush to the sunbelt is an outdated assumption.

**Changing Demographics (cont'd)**

Aging

*"Rural states are experiencing out-migration, particularly of the young. As the remaining older population (many baby-boomers) enter retirement, there is a decreasing tax base resulting in smaller state and local budgets to finance infra-structure (particularly sewer & water) rebuilding as well as other environmental protection initiatives." -*

*"One underappreciated demographic change is the 'graying' of both the United States and our overseas partners Europe/Japan. Possible implications- more pharmaceuticals likely entering the waste water supply; implications abound for skill mix of environmental professionals, etc."*

**Resource Consumption**

*"The rate and pattern of consumption around the world is the most pressing problem. It leads to deforestation, overgrazing, and resource damage and elimination. In the third world, demographics affect food, shelter, clothes and life styles. In the US it seems to be expressed as bigger and more wasteful. The tax code favors such excess."*

*"Standard of living, quality of life, is tied to consumption of material goods. This makes it harder to protect the environment. We cannot continue to consume more & more."*

*"People are getting bigger (high fructose corn syrup)"*

**Sprawl**

*"The continued low density development (sprawl) makes air quality an ongoing issue as it perpetuates reliance upon automobiles, continues to make electric distribution an issue (line loss is a major part of the distribution system) and increases the heat island effect through gigantic shopping malls and parking lots. Especially within the Office of Transportation and Air Quality (OTAQ), this acknowledgment prompted them to embark upon new and different approaches."*

*"The continuing development pattern commonly referred to as "sprawl" is depleting open spaces; increasing dependence on private vehicles over mass transit; and accelerating fossil fuel use, highway construction and vehicle miles travelled. The habitat fragmentation may be the most dire consequence of sprawl." (Staff)*

**Concentrated Agriculture & Animal Feeding**

*"Concentration of agriculture is a huge disaster. When you concentrate animals, you have more materials to move, medical interventions to prevent disease, more reliance on refined feeds and protein sources and high intensity production."*

*"As we have tried to tackle animal feeding operation (AFO) issues we receive a considerable degree of "push back" from industry which asserts that the regulatory framework was not intended to address these kinds of impacts. To minimize these impacts we will need to look at ways that markets can help encourage voluntary reductions and voluntary management. Enforcement needs to be used as a necessary "stick."*

**Policy Issues**

*"We need greater partnerships with Dept. of Transportation to address climate change impacts from congested roadways and highway dollars that support sprawl."(Staff)*

*"Many problems are the result of consumer choices, that are reinforced by financial and tax incentives and ignore the importance of environmental protection."*

*"Loss of jobs to other countries could decrease the overall standard of living in the US, possibly leading to decreasing demand for goods from US companies. This in turn could lead to a decrease in pollution, etc. Given shrinking profits, one might then expect US companies to ask for a lessening of environmental restrictions, which could lead to increased pollution. Not sure which way the balance would tip!"(Staff)*

*"Stop subsidizing energy. Have people pay for the real cost of energy, which will pave the way for alternative energy sources to be commercialized. Stop subsidizing agriculture and paying for people to grow cotton and rice in locations that are environmentally not sustainable."*

*"The fact that we must pay farmers not to pollute and to conserve habitat shows another flaw in our strategy for environmental protection."*

**Figure 4.**
**Key Disagreements – Clean Air Act**

As the traditional command and control approach of the CAA matures and the work is completed (e.g., all major mobile sources regulations are largely completed or will be shortly) the core CAA activities will move to focus more actively upon public health concerns.

EPA has established, tracked and as necessary regulated most sources of air pollution and modeled potential growth within sources. With a full load of new regulations being phased in it is unlikely that surprising environmental consequences will occur by 2011.

VS.

Regional Haze/Ozone/SMOG/Fine Particulates are creating a long-term problem. The Clean Air Act is unable to get the reductions needed to control these problems

We may be out of the air toxics business, but we'll have to deal with [transboundary] PM (particulate matter) for a long while.

**Technology**

Positive Environmental Impacts

*"Wireless communications in developing countries may reduce the ecological footprint."*

*"By 2011 [we will see] a new generation of pesticides (R8 has done studies with the walnut industry on more benign pesticides) and CAFO use of anaerobic digesters."*

*"Nanotech has the potential [to innovate/revolutionize] energy use and production."*

*"The emergence of ag based fuel sources such as oleic crops for bio-diesel, bio-mass for methane, and the use of small plots for wind power could be linked to more efficient farming practices--agriculture might become a net energy producer rather than consumer."*

Negative Environmental Impacts

*"Nanomaterials that are easily dispersed, respirable and able to get into animals and move around and are potentially catalytic or have the ability to carry out action in the wrong places and cause damage."*

*"Developing countries will use more fertilizer and pesticides to increase their agricultural yield to feed their increasing populations. This will lead to further releases of nitrogen, phosphorous and toxic chemicals into already taxed drinking water supplies."*

**Technology (cont'd)**

Uncertain Environmental Impacts

*"Development of alternate energy sources (as mentioned above) will find a nexus with agriculture creating both problems and opportunities. The more land we dedicate to producing energy, the less there will be for human food. Linking this with what appears to be a persistent drought cycle will put real pressures on water quantity and quality."*

*"As we've already seen in the agricultural sector, genetically engineering products can have surprising and unintended environmental impacts."*

*"The continuing revolution in the miniaturization of communications equipment is the most important technological change now underway. There appears to be no environmental impact unless miniaturization generates increased demand for rare metals which could result in environmental issues where they are extracted."*

*Nanotechnology and biotechnology—we are not sure if the effects will be positive or negative*

*We need to weigh the risks and benefits of miniaturization and nanomaterials.*

*Nanotechnology has great promise for limited environmental impacts, but some of its applications are unclear.*

**Figure 5.**
**Differing Perspectives – Emerging Technology**

As other renewable and alternative energy sources emerge in 2011 and especially in 2025. EPA will need to adapt to the changing energy sector and facilitate the transition to a post-petroleum economy.

VS.

There is no emerging energy source that can totally replace fossil fuels (coal, natural gas, oil) in the near future and research on fuel cells, solar, wind, and fusion have been slow to produce results. Unless there is…a major breakthrough the energy picture looks bleak (Staff)

No new sources of energy (which are both green and economic) will be developed.

*"Hydrogen cars and the required infrastructure: is anyone trying to understand this sector. What does a hydrogen economy mean environmentally? In a holistic sense, are we understanding the direction we're going for energy development?"*

*"Genomics appears to have more medical impacts than environmental, although the monitoring is likely to raise ethical and legal issues related to environmental protection. Pathogens and resistance are also concerns. Industry needs to be responsible and consortia should be developed for oversight of genomic tests, monitoring tools, and test systems."*

**Culture, Worldview, Values**

*"Environmentally, the map of the U.S. gives us an interesting picture. The West Coast and New England are "greener", because the states have stronger environmental programs and policies. Five years ago, those lines would have been shaded, and not as clear. Now, they are brighter lines. We need to explore why these conditions are not consistent across the map."*

*"Because the mid-west has the appearance of an abundance of land, there is not the same preservation ethic that exists on both coasts."*

*"The next generation coming up may not be as attuned to the environment and that will be a problem. Without an environmental ethic they will be less likely to make environmentally friendly decisions and may vote for candidates with less of an environmental ethic."*

*"The expanding gap between rich and poor has far-reaching implications. As the poor get poorer, their demands for environmentally responsible goods and practices may decline, creating less pressure to manufacture environmentally preferable products and to adopt environmentally responsible behaviors."*

# 4 New Strategies

Although several respondents placed a heavy emphasis on global issues such as transboundary air pollution, land use patterns, and water demand, few recommended specific strategies for EPA to address the related environmental impacts. Respondents suggested a multi-media, collaborative approach to address emerging, complex, issues, with an increased focus on sustainability as well as demographic, social, and economic trends.

**Incorporate Social Science**

*"Most environmental problems are the result of 'bad behavior,' by either individuals or organizations. 99% of the choices and decisions we make as consumers are not sustainable long term. We should be researching behavior change strategies that go beyond 'market incentives.' Individuals are frequently motivated by things other than the bottom line. Given right choices, many people would choose them."*

*"EPA should begin investing in tracking key demographic (population movements and trends) indicators and articulating and communicating the implications for our work. This information needs to feed into our planning, budgeting and management decisions. It's a tough sell, because it's an immediate investment with a long-term benefit, but we should do it."*

**Promote Sustainability**

*"EPA needs to address what its role is in sustainability, especially regarding sustainability of water and our role in promoting renewable energy. We shy away from these topics now, and maybe that's appropriate. But if these are important to our mission than we really need to push them more. EPA still has credibility with the public and we can push things that sometimes others cannot – like sustainability."*

*"The Agency has no appreciation of the growing awareness industrial sustainable decision-making. We're not organizing ourselves around this concept [sustainable decision-making]. We're playing catch up to industry and we're heading in directions we don't fully understand."*

**Create and Share Knowledge**

*"After 34 years of being the lead for implementation, it may be time for EPA to devote more time to developing the science to deal with problems and leave enforcement to the states. The Department of Energy has labs all over the country which provide science and engineering support. EPA should consider whether it is time to change."*

*"EPA needs to pursue a bold initiative to generate a base of environmental information to understand current conditions, track trends, forecast future conditions, assess alternative, and select optimal interventions."(Staff)*

**"***EPA should do an analysis of the global environmental issues to inform ourselves prior to the next strategic planning process."*

**Rightly Frame Markets**

*"Since the advent of the environmental era we have continued to face the future through the lens of scarcity. This can only lead us to governance schemes which allocate scarcity. And the allocation of scarcity is not sustainable. We can no longer accept regulation of wastes and incremental discharges as acceptable. The new lens must be one of abundance and plenty, where there is no waste designed into our industrial and social systems. EPA must play a leading role in this endeavor."(Staff)*

**Encourage New Technology**

*"We need to be aggressive in increasing our research into technology and to implement technological improvements as quickly as possible. The problem is that we tend to rely on existing technology. The result will be higher energy prices and more pollution because we are reluctant to spend the money for research."*

*"We are usually able to use technology to solve problems, but now we need to identify problems earlier so we're not in a crisis when its time to act. Our region is still appealing demographically and will attract lots more high-tech, educated young professionals. We need to prepare to tap the workforce of the future to deal with the problems of the future."*

**Figure 6. New Technology & Environmental Protection**

Most comments related to emerging technologies focused on new tools that will be available for EPA to monitor environmental conditions

Earth Observation System (EOS) - vast amounts of data could potentially be moved quickly and powerfully. As we develop this capability, we'll have more accurate, cost effective information that's more widely available.

We have seen gains in air monitoring technology over the past decade, such as, continuous air monitors. Something similar for water would be good.

There is some expectation that genetics will become a tool in environmental policy development, specifically, the use of genetic testing to understand pollution impacts on human health.

Bio-materials represent an opportunity to "find a better way." There are case studies in pollution reduction, materials flow, and recycling.

Nanotechnology may provide innovative solutions for restoration of contaminated groundwater. Better instruments may also be developed enabling more precise monitoring and detection of contaminants at hazardous waste sites. These technologies will be emerging in 2011 and possibly in full scale use in 2025

**Change Existing Strategies**

Integrate

*"The thesis that we are in the midst of accelerating and interacting trends in a variety of environmental, political, societal, technological and economic factors can only be quantitatively predicted using mathematical models that include interactions of many disciplines…the Agency's application of resources) will have to expand dramatically." (Staff)*

*"Global climate change is another serious issue…. The solution should be viewed in the context of the economic and environmental benefits of alternate energy sources. The research, development, infrastructure construction are all economic development opportunities awaiting exploitation."*

Collaborate

*"Our ability to do things is a function solely of having resources to do it. Resources are and will continue to be limited and decreasing. Leveraging marginal resources with others will allow us all to get two to three times more done."*

*"We should use futures gurus as consultants. The IAC would be better served reacting to ideas of bona fide futurists rather than trying to act like future thinkers ourselves. We are too immersed in the system and are captives of our long term thinking habits. Professionals could do this better and we could ground-truth it."*

Workforce Development

*"There will be new roles, new work situations, which will need new people with new skills. New program challenges from which workforce needs may arise: USA municipal water supply/treatment infrastructure – present estimated cost to upgrade/maintain is $400 billion. No "solution" in sight, no clear budgeting for this need Terrorism – unknown now – could grow as problem, or not – Agency role and size of problem will affect workforce used to address problem."*

*"[There is] looming workforce turnover, people hired when EPA was formed [are] leaving, example: EPA science moved from little to premier to departing - How do [employees who are retiring] pass on their knowledge?"*

*"The science related to our specific mission is skyrocketing, but we are not keeping pace. We need to hire and/or build the capabilities that will enable us to lead, rather than follow, developments in the rapidly changing science and technology that underlie our work. We should underwrite graduate study in related fields, possibly 2 years, with a matching service agreement for an appropriate period of time."*

*"Our programs depend to a great deal on specialized expertise. We can either go out on the recruiting market to try to attract these kinds of people, or we can train and develop our staff inside the organization. Recruiting is extremely expensive, and there is often a learning curve in addition to the recruiting time. If we grow the special expertise from within, where possible, we benefit in several ways – motivation, dedication, resource savings, and succession planning."*

Technical Considerations

*Toxic Chemicals*

*"The speed of changes in new chemical technologies will intensify the potential stresses on the environment and the workloads and political pressures to approve and license new products, ingredients, processes, and technologies...There are concerns about releasing an unknown problem and then being unable to contain it."*

*Addressing Changing Water Availability*

*"Implications of [water] availability which has an impact on recreation, dilution of materials permitted at previously reasonable rates...Permits will need to be modified or revoked. How can you characterize TMDLs when the baseline keeps changing? International issues as well: water wars in water stressed countries and regions like the Middle East, China, India and Africa."*

## 5 Looking Forward

Respondents demonstrated a grasp of several key emerging threats to the environment outside of EPA's traditional role including water demand, unsustainable land use, and international politics/economics. They seemed less certain about how to prepare for these impending problems. Few offered clear guidance on appropriate action by EPA to address complex, international issues, or considerations related to emerging technologies.

The interview results provide a useful starting point for continued trends analysis work. Additional research is needed in several areas, including:

- Incorporating demographic analysis and social research into EPA's work
- Detailed information about key technological innovations that may impact EPA's work—advanced building technology, sensor networks, developing industrial processes (bio-mimicry, global production systems)
- Future impacts related to transboundary air pollution, sprawl, and water scarcity

Staff Survey Response Tally - Sorted Alphabetically by Category

| Category | Total Responses | Total Respondents | % of Respondents |
|---|---|---|---|
| Agriculture | 9 | 6 | 33 |
| Air | 8 | 5 | 28 |
| Behavior | 5 | 5 | 28 |
| Biotech | 9 | 7 | 39 |
| Chemical | 14 | 10 | 56 |
| Climate Change | 15 | 9 | 50 |
| Demographic | 39 | 15 | 83 |
| Energy | 52 | 14 | 78 |
| Genomics | 2 | 2 | 11 |
| Internat'l | 5 | 6 | 33 |
| IT | 13 | 8 | 44 |
| Land Use | 15 | 10 | 56 |
| Material Manage | 1 | 1 | 6 |
| Nanotech | 9 | 8 | 44 |
| Policy | 49 | 16 | 89 |
| Species/Habitat | 19 | 10 | 56 |
| Technology | 13 | 7 | 39 |
| Transport | 40 | 7 | 39 |
| War/Terrorism | 2 | 2 | 11 |
| Waste Manage | 7 | 4 | 22 |
| Water | 38 | 13 | 72 |

IAC Interview Response Tally - Sorted Alphabetically by Category

| Category | Total Responses | Total Respondents | % of Respondents |
|---|---|---|---|
| Agriculture | 15 | 9 | 39 |
| Air | 19 | 10 | 43 |
| Behavior | 34 | 14 | 61 |
| Biotech | 9 | 8 | 35 |
| Chemical | 12 | 11 | 48 |
| Climate Change | 14 | 10 | 43 |
| Demographic | 54 | 21 | 91 |
| Energy | 63 | 19 | 83 |
| Genomics | 3 | 3 | 13 |
| Internat'l | 31 | 14 | 61 |
| IT | 21 | 12 | 52 |
| Land Use | 19 | 11 | 48 |
| Material Manage | 7 | 7 | 30 |
| Nanotech | 9 | 7 | 30 |
| Policy | 131 | 23 | 100 |
| Species/Habitat | 10 | 6 | 26 |
| Technology | 8 | 5 | 22 |
| Transport | 22 | 10 | 43 |
| War/Terrorism | 10 | 5 | 22 |
| Waste Manage | 13 | 7 | 30 |
| Water | 47 | 15 | 65 |

| Category | Staff % Respondents | IAC % Respondents |
|---|---|---|
| Behavior/Culture | 28 | 61 |
| Species/Habitat | 56 | 26 |
| Internat'l | 33 | 61 |
| Material Manage | 6 | 30 |
| Technology | 39 | 22 |
| Air | 28 | 43 |
| Nanotech | 44 | 30 |
| Policy | 89 | 100 |
| War/Terrorism | 11 | 22 |
| Chemical | 56 | 48 |
| Land Use | 56 | 48 |
| Demographic | 83 | 91 |
| IT | 44 | 52 |
| Waste Manage | 22 | 30 |
| Climate Change | 50 | 43 |
| Water | 72 | 65 |
| Agriculture | 33 | 39 |
| Energy | 78 | 83 |
| Biotech | 39 | 35 |
| Transport | 39 | 43 |
| Genomics | 11 | 13 |

IAC > Staff

Staff > IAC

# EPA FUTURES INTERVIEW AND BACKGROUND INFORMATION

Thank you for agreeing to be interviewed as part of a Strategic Interviewing process organized by the Office of the Chief Financial Officer. Members of the Agency's Futures Network are conducting interviews with the senior career executives who constitute EPA's Innovation Action Council.

These interviews are the initial step of an environmental trends project to promote strategic and long-term thinking across EPA by incorporating environmental futures into the Agency's strategic and regional planning processes. The project will provide information about the future to the Goal teams in order to inform their objectives and strategies. The results of these interviews will identify EPA Senior Management's views of the future. These views will provide overall context and direction for the project.

Please schedule one hour for doing this interview to make sure you have adequate time to fully set out your views. The interview process has been designed to encourage frankness. All responses will remain confidential.

This background document includes:

- The interview questions that you will be asked;
- A description of the concept and benefits of strategic interviewing;
- Justification for why it is important to think seriously about the future; and
- A few examples of forces creating change in the environment.

## The Purpose of the Interview

People and organizations constantly talk about the "future". It is only recently that governments have sought to systematically incorporate thinking about the impact of future events and changes into their goals and strategies. One of the advantages of thinking about the world 20 - 25 years into the future is that it is not too distant for people to conceptualize, yet is sufficiently far into the future to think beyond the day-to-day activities that limit our perspective and imagination.

In January 2004, members of EPA's Innovation Action Council stressed the need to incorporate futures thinking into strategic and regional planning, but with sufficient focus on the Agency's mission. Several IAC members expressed specific interest in trend analyses. The views of the future expressed in these interviews will provide context and guidance to explore areas through more detailed analysis. The results of these interviews and any in-depth trend analyses will be provided to Agency goal teams to support the next round of the Agency's strategic and regional planning. The futures network will plan for a series of workshops and meetings with the Goal planning teams to assist them in the use of this information as they revise the next strategic plan which will be due out by September 2006.

## The Futures Interview Questions

There are two time horizons for the questions: 1) out to 2011, representing the 5 year horizon of the strategic plan due in 2006; and 2) out to 2025, a 20 year horizon for goal teams that will start meeting next year.

1. When you think about those areas of the environment for which you have professional responsibility, what do you see as the two biggest long-term environmental concerns that could unfold by 2011 and 2025?

2. Demographic change can have environmental impacts. Are there specific demographic trends that you see as potential environmental problems for your program or region – either by 2011 or 2025?

3. Are there trends or emerging developments in any industrial or commercial sectors (for example, but not limited to- metals, chemicals, agriculture, services) that could have surprising environmental consequences that sharply reduce or increase environmental impacts by 2011 or 2025?

4. Do you see any developments or trends in natural resource sectors, including energy, water or materials, through 2011 or 2025 that will have an impact on your area of responsibility?

5. What "innovative and revolutionizing" technologies do you see emerging or on the horizon by 2011 or 2025? What significant positive or negative environmental effects might these technologies have?

6. As you look back on your answers to the previous questions:

    a. What are some of the implicit assumptions about the future (e.g. demographic, technological) in your program that should be examined and that futures thinking could address?

    b. What new activities and approaches would you suggest for EPA to address emerging issues you identified? What should EPA begin to address at this time through planning and budgeting processes?

7. Looking beyond your current program, are there any other environmental challenges you think may be significant in the future? If so, can you envision a potential role for EPA in dealing with these challenges?

## Strategic Conversations

In all organizations, conversations constantly take place about "what we are doing" and what we "need to be doing" or "should be doing." These conversations occur at very different strategic levels. Most conversations in most organizations are about carrying out routine *operations*, or making *tactical* changes in operations to achieve short-term objectives. These are "how" conversations dealing with how to carry out tasks and pursue agreed upon objectives. When organizations need to make significant changes, their members need to engage in higher level conversations about potential changes in *strategies* – the larger, integrated patterns of action organizations develop to achieve their major goals. Conversation at this level often goes even further to examine whether some organizational goals are obsolete and need to be

dropped, changed, or replaced by others. Conversations that go beyond "how" to deal with "what/why" – what we should be doing and why – can be called **strategic conversations.**

## The Benefits of Strategic Interviewing

An organized process of interviewing members of management, using questions that reach up to the "what/why" level, is an excellent way of fostering strategic conversation within an organization. This kind of interviewing process can be called **strategic interviewing**. Strategic interviewing has benefits for all parties. For the interviewers, it is an opportunity for learning and developing a more strategic or leadership-level outlook. For the interviewees, it provides an occasion for reflection, an opportunity to promote their ideas and priorities, and a chance to compare their own views with those of other senior career executives. The people being interviewed constitute an internal panel of experts. For the organization's top-level leadership, it provides a valuable overview of challenges and opportunities ahead.

An organized interviewing process produces a wide range of future-oriented information, including people's views about ongoing trends, potential trend reversals ahead, and emerging or potential developments. It produces critiques of current operations, strategies, and goals along with suggestions for changes in priorities and ideas for new initiatives. Above all, it helps identify potential dangers that need to be headed off and potential opportunities for new missions.
This range of information is valuable in itself.

The next several pages of slides provide a glimpse of a few potential trends that could have significant impact on EPA programs.

## Future Environmental Challenges
Sample Trends With Implications for EPA Programs

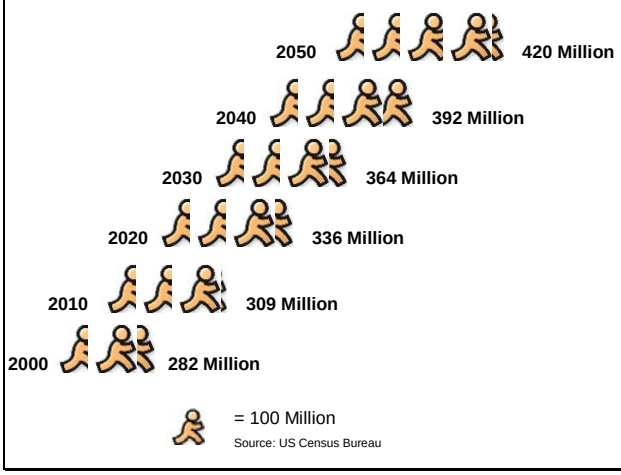
- Demographics
- Emerging Technologies
- Current Trends & Future Implications

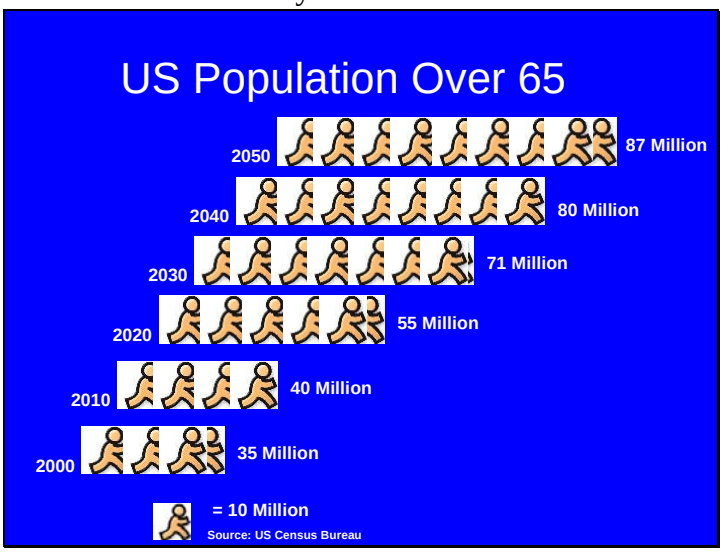
DRAFT

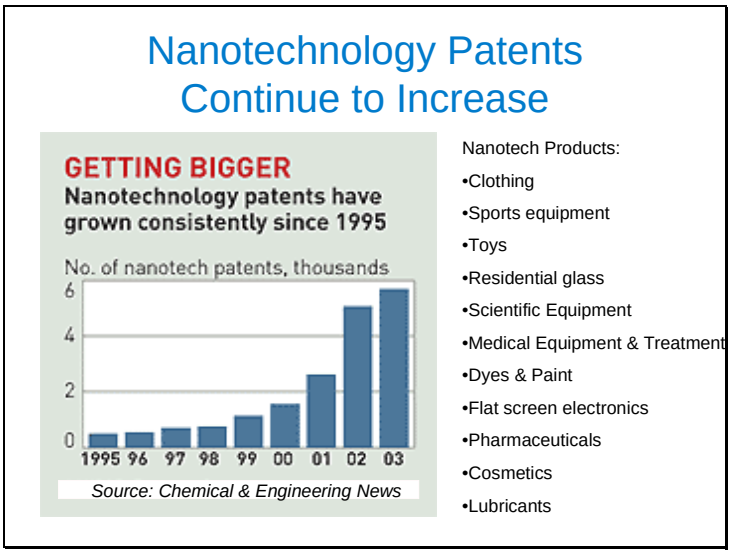
## Demography and Environment: Possible Issues

- Air quality attainment
- Areas with likelihood of rapidly changing emissions
- More children at risk of asthma
- Water quantity and quality
- New chemicals, products in wastewater
- New solid waste streams
- Coastal environmental impacts

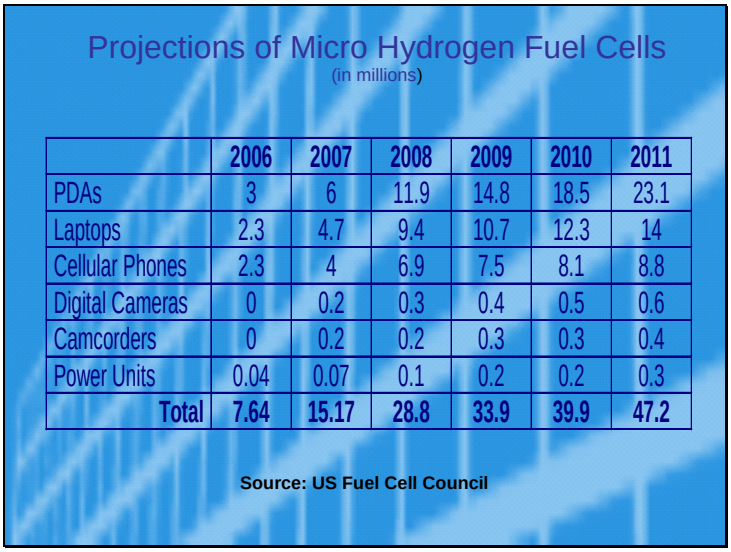
## Projected US Population: 2000-2050



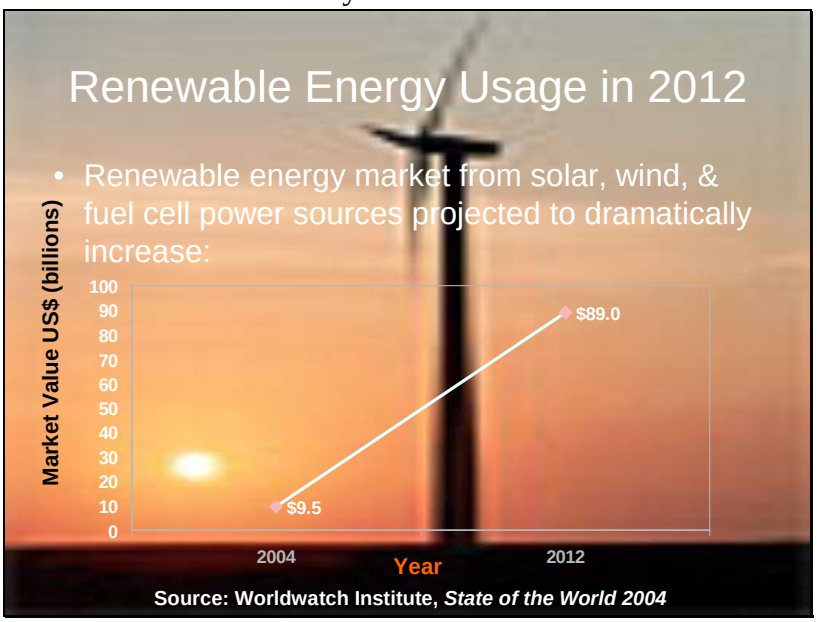


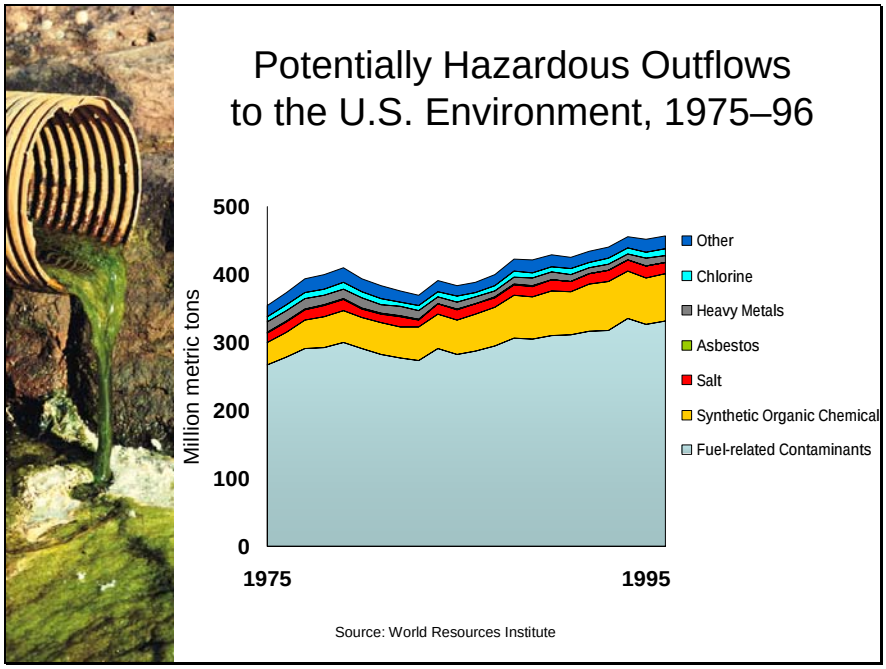




Morrissey, Susan R. "Harnessing Nanotechnology." *Chemical and Engineering News,* 82(16): 2004, 30-33.




| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|
| PDAs | 3 | 6 | 11.9 | 14.8 | 18.5 | 23.1 |
| Laptops | 2.3 | 4.7 | 9.4 | 10.7 | 12.3 | 14 |
| Cellular Phones | 2.3 | 4 | 6.9 | 7.5 | 8.1 | 8.8 |
| Digital Cameras | 0 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 |
| Camcorders | 0 | 0.2 | 0.2 | 0.3 | 0.3 | 0.4 |
| Power Units | 0.04 | 0.07 | 0.1 | 0.2 | 0.2 | 0.3 |
| **Total** | **7.64** | **15.17** | **28.8** | **33.9** | **39.9** | **47.2** |

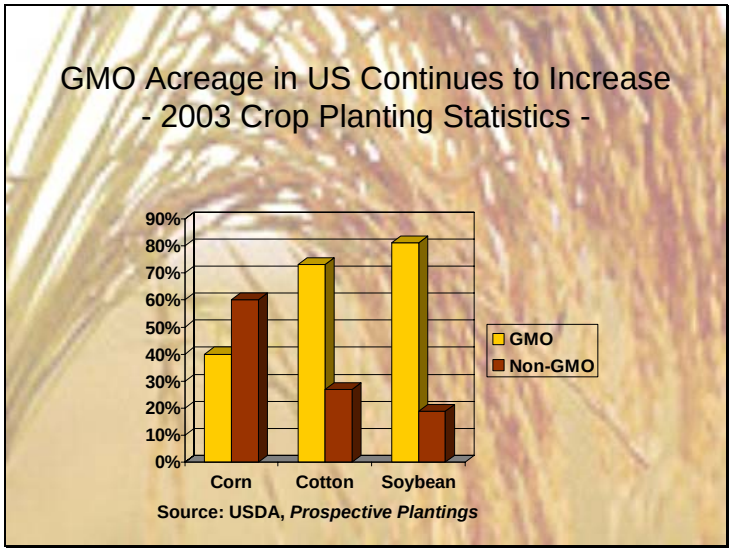


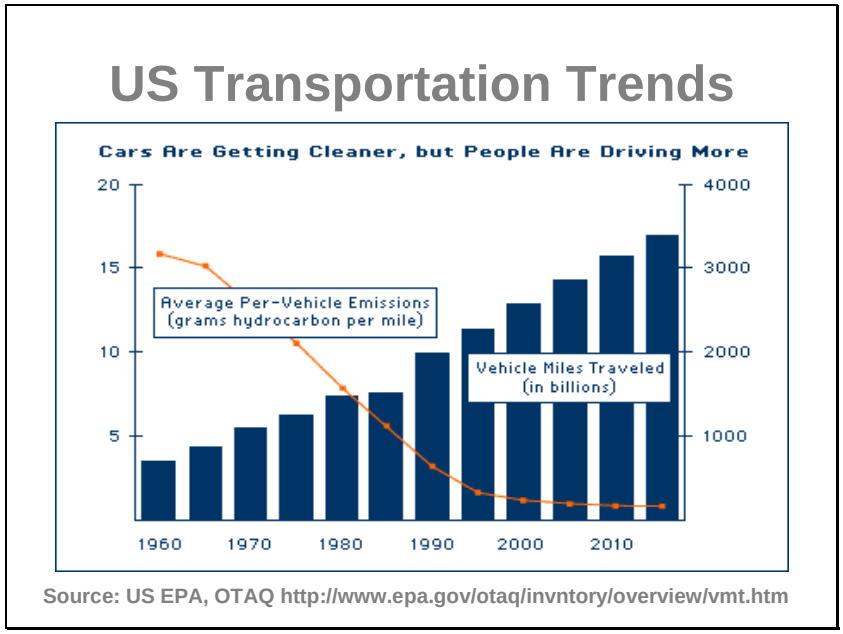




This chart shows not just substances officially listed as hazardous - regulated or listed under TRI - but all materials that are potentially harmful in the environment.

Many occur not at processing or manufacturing stage, but further up or downstream. Many embodied in products.

NOTE: category of fuel-related contaminants contains over 200 flows, but dominated by coal fly ash, methane leaks, and oil spills.




Includes: passenger cars, buses, lorries, and vans; excludes motorcycles & mopeds.

Source: International Road Federation. "Table 5A." *World Road Statistics 2000.* CD-ROM. Geneva, Switzerland: International Road Federation, 2002. Internet. Available: http://www.irfnet.org.

## Appendix B – Interview Analysis Methodology

### Coding

1. Identifying information was stripped from each interview. Staff and IAC responses were compiled in separate excel files.

2. Responses were coded by category. The category headings were developed after a preliminary review of responses:
   Agriculture, Air, Behavior, Biotechnology, Chemical, Climate Change, Demographics, Energy, Genomics, Information Technology (IT), Land Use, Material Management, Policy, Species/Habitat, Technology, Transportation, Waste Management, International/Immigration, Nanotechnology, War/Terrorism, Water, and Miscellaneous.

3. Each response was classified by subcategory in a second round of coding.

4. A second excel file was created to break responses into worksheets by category. In cases where the subcategory matched an existing category heading, the response was included in both worksheets.

### Analysis

Quantitative

Responses were tallied by category and subcategory, time frame, positive or negative outlook, and relative importance (# of respondents vs. # of responses).

Given the relatively small number of respondents, the interview data did not lend itself to detailed quantitative analysis, but this tally provides a useful instrument for rapid review of key topics mentioned by interviewees and a simple comparison between staff and IAC respondents.

The attached tally sheet summarizes total responses for each category and as well as total respondents who mentioned each category.

Qualitative

The primary purpose of the interview results is to inform the next stages of the futures team's trends analysis. The summary report contains quotes that are either representative of prevailing respondent opinions or particularly insightful comments.