

## EXECUTIVE SUMMARY

The capabilities of civilization to build a better future are rich but terribly inefficient. Improving efficiency requires seeing the status of the whole and its parts as objectively as possible. For example, the avian flu could mutate and kill 25 million people, higher oil prices could plunge some economies into depressions, increasing natural disasters are causing massive human misery, and millions of people are caught in deadly conflicts around the world. Yet it is a fact that the world is becoming more peaceful, prosperous, and healthy.

The first *Human Security Report* found that the number of armed conflicts declined by more than 40% since the early 1990s, that genocides and politicides fell 80% between 1988 and 2001, that international crises declined by more than 70% between 1981 and 2001, that the dollar value of major international arms transfers fell by 33% between 1990 and 2003, and that the number of refugees dropped by some 45% between 1992 and 2003. The IMF estimates that the world economy grew 4.8% in 2005, while the population grew 1.15%, increasing annual per capita income by 3.65%.

The UN Millennium Development Goals continue to help focus international cooperation and increase sensitivity to global long-term perspectives in policymaking. Although criticized by some as too ambitious, these goals are increasingly becoming the benchmarks for global progress and measures for international efficiency. Over half of the world's \$62-trillion economy is generated in developing countries. Over a billion people (16% of the world) are connected to the Internet. The digital gap continues to close, helping to democratize the coming knowledge economy with tele-nearly-everything and providing self-organizing mechanisms for emerging collective computer/human intelligence and management systems. A worldwide race to connect everything not yet connected is just beginning, and great wealth will be generated by completing the links among systems by which civilizations function and flourish.

Yet terrorism is getting worse and will continue to do so as long as the world's systems seem unjust. There are still 27,000 nuclear weapons in the world. Water tables are falling on every continent, 40% of humanity gets its water from sources controlled by two or more countries, much agricultural land is becoming brackish, and urbanization is increasing water demands faster than many systems can supply. More than half of all Africans live on less than \$1 a day, and life expectancy in Africa is falling due to AIDS. Future desktop molecular and pharmaceutical manufacturing, genomic and other software, and access to organized crime's nuclear materials could eventually give single individuals the ability to make and use weapons of mass destruction. The combination of \$1 trillion paid in government bribes, over \$2 trillion income for organized crime, a proliferation of terrorism, and trivial entertainment flooding our minds with unethical behavior cries out for far more effective and ethical leadership. The increasing proliferation of media and information makes it difficult to separate the noise from the signal of what is important to know about our global situation in order to make good decisions.

Human consumption is now 23% larger than nature's capacity to regenerate or to absorb our "ecological footprint." Environmental trends make it clear that either human society changes or eventually nature will change society for us. It is increasingly passé and ignorant to think that humanity has to choose between economic growth and environmental protection. Carbon dioxide levels are now greater than at any time in the last 650,000 years; the surface temperature of Earth has been warmer over the past several decades than during any comparable period in at least 400 years; six of the last eight years were the hottest on record; the Gulf Stream heating effect for Europe has been reduced by 30% due in part to overlying fresh water from melting glaciers; and the melting tundra is releasing methane, which is 22 times more powerful than CO<sub>2</sub> in terms of climate change.

Income gaps are widening within 53 countries representing 80% of humanity. About 2.5 billion people (40% of the world) live on \$2 or less per day. Trade-led economic growth could become a disaster for poorer countries that will not be able to compete against the growing high-tech, low-wage industrial capacities of China and India. Those countries dependent on commodity exports will fail as their resources are depleted or substitutes are adopted by importers.

Hence, business as usual will lead to disasters ranging from massive environmental and economic failures to large-scale migrations and increasing rage against what is perceived to be injustice and inequities. At the extreme lies usage of weapons of mass destruction, even usage by a single individual. There is a growing hunger around the world to do what is right for our common future, but effective leadership with details for action is missing. There is a race between the growing proliferation of threats and our increasing ability to improve the human condition.

After 10 years of global participatory futures research by the Millennium Project, it is clear that humanity has the resources to address its global challenges, but unfortunately it is not clear how

much wisdom, goodwill, and intelligence will be focused on these challenges.

It was encouraging to see the two wealthiest men in the world—Bill Gates and Warren Buffett—combine over \$60 billion to assist the least wealthy in the world. Major inventors—from Dean Kamen, the engineer who invented the Segway, to Iqbal Qadir, the founder of GrameenPhone, the largest cell phone company in Bangladesh—are beginning to focus on solving the water-energy crisis for the poorest 1.5 billion people in the world. Craig Venter, who completed the human genome project, is now using that knowledge to create low-cost environmentally safe electricity. Former President Bill Clinton's foundation has succeeded in bringing down the treatment cost for some AIDS patients to \$140 per year. These individual initiatives of the rich and powerful to address global challenges are a hopeful sign.

Meanwhile, the world's population of 6.53 billion is expected to grow to about 9 billion by 2050 before it falls rapidly to possibly 5.5 billion by 2100. This assumes no major scientific and technological breakthroughs affecting longevity over the next century, an unlikely assumption. Even today scientists are injecting stem cells to repair and maintain the body, which in theory could extend life indefinitely. The concepts of aging and retirement, along with the organization of health care systems, will have to change. The populations of Russia and Japan are shrinking, as will others, due to falling fertility rates. Urban areas of developing countries will produce nearly all the population growth over the next 50 years.

UN Secretary-General Kofi Annan has noted that "the spread of democracy around the world has been one of the signal transformations of our times." Although the number of electoral democracies is increasing, press freedoms are decreasing. According to Freedom House, only 17% of the world's population has access to free media. E-government is taking hold around the world and it will become more effective as increasing numbers of citizens have access to the needed technologies.

A less predictable factor influencing our future is the changing state of infectious diseases. Avian flu has spread among birds in more than 50 countries. By mid-2006, WHO had confirmed 228 human cases of avian flu in nine countries, with 130 deaths. If genetic mutations in the H5N1 avian flu virus allow human-to-human transmission, then 25 million people may die—with untold effects on airlines, tourism, and other economic sectors. Although it took 15 years to work out the genetic sequence of HIV, and less than a month to sequence SARS, the strategy of rapidly producing and distributing vaccines may not be able to keep up. An alternative approach is to create medicines that can give a large and fast boost to the immune system regardless of the disease and to store these medicines around the world for faster local distribution to isolate future infections and stop their spread. Meanwhile, AIDS has become the fourth leading cause of deaths in the world: 25 million people have died from AIDS, with 3.16 million deaths in 2005. Another 65 million people are living with HIV/AIDS, a number that increased by 4.9 million in 2005—the largest one-year increase. At the same time, the demand for nurses is increasing as fewer people enroll in nursing schools and more retire earlier, creating shortages worldwide.

According to UNFPA's *State of World Population 2005*, "gender-based violence is perhaps the most widespread and socially tolerated of human rights violations." WHO reports that after diseases and hunger, violence against women is the greatest cause of death among women. In addition, WHO notes that one in five women will be a victim of rape or attempted rape in her lifetime and that, depending on the country, 10–69% of women report being physically assaulted by an intimate male partner at some point in their lives. UNIFEM and Amnesty International estimate that one in three women suffers some form of violence in her lifetime. About 80% of the 600,000–800,000 individuals trafficked each year are female, making it the "largest slave trade in history" and one of the fastest-growing areas of organized crime. Previous estimates by the IMF that money laun-

dering accounted for 2–5% of the world economy have increased to 10% in alternative estimates. Hence, the total amount of money laundered may range from \$1.2 trillion to \$6.2 trillion. By comparison, all the military budgets of the world combined are just over \$1 trillion per year. The 14 million AIDS orphans today could increase to 25 million by 2010, creating a gigantic labor pool for crime.

Meanwhile, the Chernobyl nuclear power plant is still leaking radioactivity 20 years after the accident there, and Ukraine's President has asked for \$1 billion for better containment. Some 1.6 billion people have no access to electricity, and some 2.4 billion still rely on traditional biomass for cooking and heating while the world wastes billions of gallons of petroleum in traffic jams annually. High oil prices are finally triggering more investments into alternative energy and carbon sequestration; however, it does not seem enough to prevent increased climate change, which could trigger serious backlashes from nature and from environmental movements.

Just as lines of code were written to create software to do amazing things, genetic code may be written to create life to do even more amazing things, such as producing hydrogen fuel instead of oxygen from photosynthesis. Artificial organs may be constructed by depositing living cells, layer by layer, using dot-matrix printers in a manner similar to 3-D prototyping. Future synergies among nanotechnology, biotechnology, information technology, and cognitive science can dramatically improve the human condition by increasing the availability of food, energy, and water and by connecting people and information everywhere. The effect will be to increase collective intelligence and to create value and efficiency while lowering costs. The factors accelerating all these changes are themselves accelerating, which will make the past 25 years seem slow compared with the next 25. The sooner more efficient means are used to understand and address global challenges the better. Time is not on our side.

The world needs a process to focus government,

corporate, and university scientific, engineering, and medical resources to achieve the eight UN Millennium Development Goals and address the 15 Global Challenges described in *State of the Future*. We need transinstitutional management and more serious public education through the media. Former U.S. Vice President Al Gore's *An Inconvenient Truth* is one example. Imagine having such movies available for all the global challenges. What would the world be like if those who work hard to improve the prospects for humanity were assisted by the many who seem not to care?

It has been considered ridiculous to try and achieve health and security for all people. Equally ridiculous today is thinking that one day an individual acting alone will not be able to create and use a weapon of mass destruction, or that there will not be serious pandemics as we crowd more people and animal habitats into urban concentrations while easy transborder travel exists and biodiversity is diminishing. The idealism of the welfare of one being the welfare of all could become a pragmatic long-range approach to countering terrorism, keeping airports open, and preventing destructive mass migrations and other potential threats to human security. Ridiculing idealism is shortsighted, but idealism without the rigors of pessimism is misleading. We need very hardheaded idealists who can look into the worse and best of humanity and can create and implement strategies of success.

## State of the Future Index

People have always wanted to know if the future is getting better or worse, where we are winning and losing, and where resources should be focused to improve our prospects. It seemed impossible to do this on a global scale. The World Bank does this in economics, the WHO does this for health, the International Energy Agency does this for energy, but how can it all be brought together to see the prospects for humanity as a whole? One approach is the State of the Future Index. This is a measure of the 10-year outlook for the future in general. It is constructed with key variables and forecasts related to the global challenges that have emerged from probably the largest on-going participatory futures process in history.

Assessing the world's key indicators over the past 20 years and projecting them for the next 10 gives us the basis for a report card for humanity's future, showing where we are winning or losing. (See Box 1.)

SOFIs have also been constructed for countries and could be put together for other sectors, such as energy, or for individual organizations. Chapter 2 reviews the evolution of the SOFI concept and suggests research for its further development. The global SOFI shows that the future is getting better, but not as rapidly as it did over the past 20 years.

Box 1. SOFI Variables' Progress and Regress Provides a Report Card on the World

Where we are winning:	Where we are losing:
<ul style="list-style-type: none"> <li>• GDP per capita</li> <li>• Food availability</li> <li>• Life expectancy</li> <li>• Adult literacy</li> <li>• Infant mortality</li> <li>• Access to safe water</li> <li>• Access to health care</li> <li>• School enrollment</li> </ul>	<ul style="list-style-type: none"> <li>• Atmospheric carbon dioxide</li> <li>• Unemployment</li> <li>• Forestlands</li> <li>• Number of poor people</li> <li>• AIDS deaths</li> <li>• Developing-country debt</li> <li>• Terrorist attacks</li> </ul>

## Global Energy Scenarios

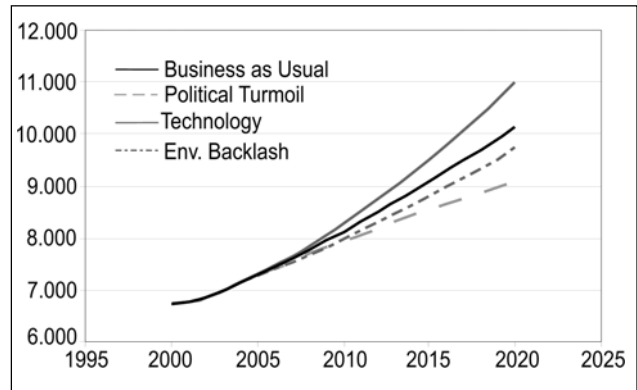
Increasingly high oil prices, projections of climate change, and speculation about when global oil production will peak and then decline has made energy one of the top issues today. Chapter 3 describes four global energy scenarios. ***Business as Usual*** assumes that the global dynamics of change continue without great surprises or much change in energy sources and consumption patterns other than those that might be expected as a result of the dynamics and trends already in place. ***Environmental Backlash*** assumes that the international environmental movement becomes much more organized; some groups lobby for legal actions and new regulations and sue for action in the courts, while others become violent and attack fossil energy industries. ***High-Tech Economy*** assumes that technological innovations accelerate beyond current expectations and have impacts in the energy supply mix and consumption patterns of a magnitude similar to the Internet's impact in the 1990s. And ***Political Turmoil*** assumes increasing conflicts and wars, with several countries collapsing into failed states, leading to increasing migrations and political instabilities around the world. An annotated bibliography of global energy scenarios and related research, along with the results of a two-round Delphi, provided the data, information, and judgments to construct the scenarios—all of which are available in the CD Chapter 3 "Global Scenarios."

The International Futures models were used for additional quantitative scenario data, allowing for a several comparisons among the four scenarios.

Figure 1. Energy Demand: (bill. barrels OE)  
Comparison of the Four Global Energy Scenarios 2020



Figure 2. GDP per Capita:  
Comparison of the Four Global Energy Scenarios 2020



### Environmental Security

The increasing destruction from natural disasters, threats from avian flu, and the realization that humanity is using more resources than nature can provide continues to move environmental security up the global agenda for many people around the world. It has even been suggested in a UN report that the UN Security Council make environmental security a priority. Even the People's Liberation Army of China now has to submit its construction and training plans, as well as its materiel transfers and weapon purchases, repair, and disposal, to local authorities for approval in terms of environmental impacts. The President of China issued new regulations that specify assessment procedures and penalties for infractions of this new set of requirements. More than 500 multilateral environmental agreements have triggered a series of efforts to bring greater coherence to international environmental governance.

Environmental security is the viability of the environment for life support, with three sub-elements: preventing or repairing military damage to the environment, preventing or responding to environmentally caused conflicts, and protecting the environment due to its inherent moral value. More than 250 items related to environmental security have been identified during the past year, as well as about 700 items since the Millennium Project began producing monthly reports on these issues in August 2002, the distillation of which appears in Chapter 4. The full text of the items and their sources can be found in the CD Chapter 9.1, "Emerging Environmental Security Issues," along with monthly updated reports on the Millennium Project's Web site, [www.acunu.org](http://www.acunu.org) (under "What's New," select "International Environmental Security Issues").



### Reflections on the Tenth Anniversary

This is the tenth annual *State of the Future* report produced by the Millennium Project. Although a 10-year evaluation was not done, in Chapter 5 the staff and Planning Committee of the Millennium Project share some of their views about the possible contributions of the Project and its annual reports, plus some key insights and novel ideas developed over the last 10 years. The chapter concludes with some thoughts about the next 10 years. This final section of the Executive Summary includes related but unique findings from previous research.

The dynamics of urbanization coordinates with so many important improvements to the human condition that urbanization, once thought a problem, is now part of the solution to poverty, ignorance, disease, and malnutrition.

Although the interdependence of economic growth and technological innovation have made it possible for 3–4 billion people to have relatively good health and living conditions today, unless our financial, economic, environmental, and social behaviors are improved along with our industrial technologies, the long-term future could be more difficult.

Most people in the world may be connected to the Internet within 15 years, making cyberspace an unprecedented medium for civilization. This new distribution of the means of production in the knowledge economy is cutting through old hierarchical controls in politics, economics, and finance. It is becoming a self-organizing mechanism that could lead to dramatic increases in humanity's ability to invent its future.

As the integration of cell phones, video, and the Internet grows, prices will fall, accelerating globalization and allowing swarms of people to quickly form and disband, coordinate actions, and share information ranging from stock market tips to bold new contagious ideas (*meme epidemics*).

Creating global partnerships between the rich and poor to make the world work for all, which seemed like an idealistic slogan before September

11th, may prove to be the most pragmatic direction as the possibilities increase that individuals may one day have access to weapons of mass destruction. To prevent individuals from growing up to be massively destructive, we should begin to explore how to connect the systems of education, mental health, and security in a democratic and effective way.

There are many answers to many problems, but there is so much extraneous information that it is difficult to identify and concentrate on what is truly relevant. Since healthy democracies need relevant information, and since democracy is becoming more global, the public will need globally relevant information to sustain this trend.

The great paradox of our age is that while more and more people enjoy the benefits of technological and economic growth, growing numbers of people are poor and unhealthy, and nearly the same percentage of the population has lacked access to education over the past 30 years. World leaders are increasingly seeking a common platform among UN organizations, the World Bank, the IMF, the WTO, multinational corporations, and other key actors of globalization in order to address this issue.

Since technology is growing so rapidly along several fronts, the possibility of it growing beyond human control must now be taken seriously.

National decisionmakers have not been trained in the theory and practice of decisionmaking, and few know how advanced decision support software could help them. Formalized ethics and decision training for decisionmakers could result in a significant improvement in the quality of global decisions. In addition to policymakers needing training in how to make decisions, processes to set priorities (local, national, and international) need further development. We know the world is increasingly complex and that the most serious challenges are global in nature, yet we don't seem to know how to improve and deploy Internet-based management tools and concepts fast enough to get on top of the situation.

The role of the state is more important in countries where there is little private-sector activity;

hence policies that make sense in western industrial countries that include leadership from the private sector are less applicable in poorer regions.

When the actions of one country threaten the security of many, when do the many have the right to intervene in the affairs of the one? The extent of national sovereignty continues to be a key element in the analysis of environmental security, terrorism, climate change, the International Criminal Court, and management of future S&T risks.

Since education is one of the fundamental strategies to address most global challenges, it is important to identify the most effective educational materials, curricula, and distribution media for global education as well as institutional arrangements to accelerate learning.

Although many people criticize globalization's potential cultural impacts, it is increasingly clear that cultural change is necessary to address global challenges. The development of genuine democracy requires cultural change, preventing AIDS requires cultural change, sustainable development requires cultural change, ending violence against women requires cultural change, and ending ethnic violence requires cultural change. The tools of globalization, such as the Internet, global trade, international trade treaties, and international outsourcing, should be used to help cultures adapt in a way that preserves their unique contributions to humanity while improving the human condition. UN Secretary-General Kofi Annan has pointed out that "full equality for women means more than the accomplishment of statistical objectives: the culture has to change."



The insights in this tenth year of the Millennium Project's work as reported in this year's *State of the Future* can help decisionmakers and educators who fight against hopeless despair, blind confidence, and ignorant indifference—attitudes that too often have blocked efforts to improve the prospects for humanity.