



THE FORUM

IN THE YEAR 2049: What Will Environmental Protection Be Like 40 Years From Now?

December 22 marks the 40th anniversary of the National Environmental Policy Act, which started the modern era of environmental law, and the 40th anniversary of the Environmental Law Institute, which was founded to monitor the new field and to create a profession around the emerging discipline. To mark this anniversary, we asked a range of luminaries to forecast how environmental law and the profession dedicated to its successful

implementation will mature over the next four decades. Will environmental protection still be the product of a social movement, or will it have become incorporated as part of the cost of doing business? Will businesses go beyond their legal requirements and lead the movement to sustainability, or will government still be wielding carrots and sticks? Will individuals modify their lifestyles, or will technology make increased environmental quality a natural outcome of economic improvement?



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Ten Reasons for Environmental Optimism

JOHN C. CRUDEN

Looking into the future on any topic is challenging. But predicting future development in environmental law and policy is particularly daunting, since we are now in such a transitional time in our industry. New statutes, advancing technology, diminishing resources, emerging economic demands, and international developments make any crystal ball effort highly subjective. With that caution in mind, I present 10 predictions.

1. The field of environmental protection will have grown in importance and stature. Environmental law will also be broader than it is now, having merged with both energy law and natural resources law. There will be specialized federal courts to deal with environmental issues and allocate scarce resources.

2. Sustainable development will be part of every person's lexicon and will be taught in elementary school.

3. Issues of importance will often be resource quantity and quality, such as water, forests, and agricultural land.

4. Population issues will drive decisionmaking. Urban planning and land use decisions will be considered an integral part of environmental protection.

5. New technology will revolutionize pollution abatement decisions but will create new problems we can't anticipate now.

6. Smart grid concepts will completely take over current oil and gas considerations, and there will be a smart grid for water resources.

7. International cooperation will be taken for granted. International tribunals will exist.

8. Individuals running for public office will be elected based on their knowledge of, and commitment to,

robust environmental protection.

9. Today's emerging issues like nanotechnology and biotechnology will be mainstream.

10. There will still be a need for government enforcement and oversight, although it may take on new forms — given human nature, government will always have a role in protecting the environment. Government's role may change, however, and rely more on developing citizen monitoring and reporting.

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Looking at the Percentages of Possibility

LEE A. DEHIHNS III

With full faith in the spirit and ingenuity of the American people and our elected officials at all levels of government, I see the following as a snapshot of the state of environmental management in 2049.

All communities larger than 25,000 population in the United States will have implemented development practices acknowledged as necessary for sustainability. More than 50 percent of all wastewater, both public and private, will be beneficially reused in some fashion. Any that must be discharged will be treated to such advanced levels that all pollutants will be measured at or below parts per quadrillion.

Seventy-five percent of all communities with greater than 50,000 population will operate in a carbon-neutral fashion. Carbon sequestration will prove to be a success. There will be no stacks with visible emissions of air pollution. Over 90 percent of air emissions will be captured and destroyed to levels of non-detection.

The precautionary principle rooted in the European Union's REACH rules will be fully implemented into chemical manufacturing in the United States and abroad. All chemical plant operations will have been deemed safe and secure, and all products made with chemicals will be safe to use.

Alternative energy sources will make up more than 60 percent of the fuel supply for the United States and more than 75 percent of automobiles will be powered by non-petroleum sources. Solid waste recycling and reuse will have become so prevalent that what landfills that remain necessary are deemed safe. Inland and estuarine waters will be warmer until after 2050, but the warming trend will peak by 2035 and land and water dependent species will begin recovery prior to mid century.

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Our Destiny Not in the Stars But in Ourselves

CHARLES E. DI LEVA

By 2049, the world's population may grow from 6.8 billion to more than 9.5 billion. Most will inhabit developing countries, ill prepared for a world warmed by anywhere from two to nine degrees Celsius and facing widespread ecosystem collapse. These adverse impacts will cross borders, affecting both rich and poor.

The Millennium Ecosystem Assessment determined that most ecosystem services are endangered by climate change, as well as unsustainable agri-

cultural, forestry, and fishing practices. Already, 75 percent of global fishing stocks are fully or over-exploited. Rapid action can reverse such declines, but even the wealthiest countries have failed to suitably act, often allowing or subsidizing unsustainable practices in the face of contrary legal obligations. Unsustainable practices also produce unpredictable transboundary impacts; witness Somalia, where some pirates claim their international piracy is due to illegal foreign fishing vessels that destroyed their livelihood.

Provisionally, the resources exist to address these challenges. Indeed, studies show we can limit temperature increases to 2 degrees Celsius for an annual global commitment, through 2030, of \$250 billion to \$1.2 trillion. Globally, nations are only spending a fraction of what is necessary, unfortunately. By comparison, annual military expenditures exceed \$1 trillion. Thus, the World Development Report 2010 on "Development and Climate Change" notes, "The greatest challenge lies with changing behaviors and institutions, particularly in high income countries."

Still, new endeavors offer hope. The acclaimed Desertec project could provide \$2.5 trillion worth of clean energy by 2050 by placing 6,500 square miles of solar panels in barren northern Africa deserts. It aims to provide Africa with clean power, desalinated seawater, and sustained revenue, while meeting 15 percent of mainland Europe's total energy needs.

Will negotiations at Copenhagen lead to a new environmental ethic enabling such progressive developments? If not, we may remind ourselves of Cassius's words to Brutus, "The fault, lies not in the stars, but in ourselves."

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Environmental Law in 2049: A Look Back

By MICHAEL B. GERRARD

I never expected to see my 98th birthday. However, thanks to the brilliant invention of the Methuselah pill by Dr. Malia Obama in 2024, the year after her graduation from Harvard Medical School, last August I celebrated with my family and looked back on my 70 years in environmental law.

As I told the kids, the '10s, '20s, and '30s were dominated by the great energy transition. A whole generation of environmental lawyers handled the litigation, the rulemakings, the construction contracts, and the international trade hearings (many of them conducted in Mandarin) that ultimately led to today's solar/wind/fusion economy. The younger lawyers got their training defending or prosecuting the tickets issued by the efficiency police (such as misdemeanor possession of a plasma TV), while novice accountants labored over cap-and-trade forms.

But it wasn't soon enough. The initial legislation was so watered down that U.S. emissions continued to rise through the '30s. Carbon dioxide levels passed 600 parts per million in 2040, the same year the last polar bear died in the balmy Anchorage Zoo.

Today, of course, environmental law is dominated by the constant movement of water. Closed landfills and capped brownfields flood from both the top and the bottom. Mapped wetlands disappear or grow; deserts mostly grow. The no-development zones next to coastal waters keep expanding. The hearings on the proposed \$1 trillion aqueduct from western Canada to California's Central Valley just entered their 20th year. The property, business interruption, and title insurance markets remain in chaos.

Meanwhile, lawyers keep busy with

the fallout from the energy transition — leaking carbon sequestration reservoirs, the closure of the last fission reactors and the transport of their spent fuel to the repository under Wasilla, Alaska, the dismantling of first-generation wind and solar farms. And military tensions are rising over geoengineering, especially since the Russians launched space mirrors — one tilted and started illuminating Seoul at night, and the Koreans shot it down.

Now my nonagenarian colleagues and I laugh at the days when we worried about parts per billion and about one-in-a-million cancer probabilities. The drowning of Bangladesh in 2045 gave us new perspectives on what risks are worth worrying about.

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The End of the Environmental Profession

PAUL E. HAGEN

In 2049, the practice of environmental law will be on the wane. The nation's most pressing environmental challenges will have taken a dramatic turn for the better following bold actions in Congress, corporate board rooms, and communities across the country.

Many credited the passage of the Public Health and Recreation Act of 2012 for kick starting the gains by making our communities greener and healthier. With a vision rarely seen in the U.S. Congress, legislators determined to control rising health care costs joined with those dedicated to conservation to fully fund the Land and Water Conservation Fund. With a new, sustained commitment, the nation saw a dramatic expansion of urban green space, wildlife refuges, and

national parks. The investment delivered dramatic improvements in public health as Americans got on the move and rediscovered the outdoors.

Shortly thereafter, Congress passed the American Farms and Rivers Preservation Act that linked future agricultural subsidies to improvements in environmental performance. As a result, many of the nation's most productive estuaries, little more than dead zones decades earlier, saw their fisheries roar back to life. In the Chesapeake Bay watershed, the number of people making their living off the land and the water reached numbers that had not been seen in generations.

Companies discovered large and sustainable profits in bringing new products to market at lower cost and with reduced impacts on the environment. These companies joined with a new generation of non-profit leaders to create new markets by educating consumers on science, real (rather than perceived) risks to human health, and the environmental and social benefits that can arise from informed consumer choices and sustainable production.

After decades of hard and creative work, the Environmental Law Institute announced that it would be closing its doors at year end. ELI and its partners will have succeeded in making the law work for people, places, and the planet.

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The CFR Will Still Exist, but Markets Will Rule the Day

SARA KENDALL

By the midpoint of the 21st century, government-driven environmental regulation will be on a path of increasing irrelevance. The Code of Federal Regulations will

still exist and be based on the present paradigm of controlling environmental performance medium by medium, but its impact will not have the relevance for how environmental protection functions that it does today.

Far more important in terms of driving point-source performance will be nongovernmental consensus standards driven by consumer demand and a robust and active market for pollutants and carbon. Exchanges for these byproducts will be commonplace globally. They will be very effective for driving change in developing economies. The focus within the U.S. system will be on mandating and regulating the marketplace.

The environmental law and policy system will shift toward increased use of economics to drive performance results. Externalities such as pollutant impacts and ecosystem benefits will be monetized and accounted for in corporate practices. Economics, rather than inefficient command-and-control regulation or punitive social engineering approaches, will address the burgeoning populations that will continue to seek an improved standard of living.

Nongovernmental interest groups will continue to play a strong motivating and agitating role in moving the environmental agenda. But the object of their efforts will be biased far more toward the marketplace and less toward government. There will be mandatory labeling of products incorporating carbon, energy, and sustainability disclosures developed with lifecycle analysis. For better or for worse, litigation will remain a heavily relied upon tool.

Local governments will increasingly find themselves the focus of pollution-reduction efforts as water availability, nonpoint-source, and land-use impacts become the biggest challenges faced by society. Industrial point-source pollution will be largely a nonissue, no longer driving environmental law and policy.

Sara Kendall is Vice President for Corporate Environment, Health and Safety at Weyerhaeuser Co.

Fundamental Change, or Change for the Worse

PETER LEHNER

Despite 40 years of hard work and achievement, almost all indicators of human and ecological health today show dramatic trends for the worse. By 2049, and perhaps before, communities around the globe will not accept this state of affairs; change will come from the groundswell of ordinary people demanding a better future. Environmental protection in 2049 will, of necessity, be a far more central part of life than it is now.

Why? Because there will be no choice. With more people on the planet, each of us seeking a higher quality of life, the environmental impact of our actions — our food, our travel and recreation, our homes and offices, our “stuff” — will be central to our lives. Our environmental footprint will be unavoidable.

We will no longer assume that externalizing all possible costs is a wise economic choice. We will need to change the basic presumption that unfortunately exists today — that we are free to pollute unless limited by government. In 40 years that presumption will be reversed; there will be widespread understanding that poisoning others or the planet is the exception, not the rule. Our laws will be changed so that industries will need to justify any harmful discharge and pay the full cost.

Attitudes will also have changed. Pollution or desecration of our last remaining wild spaces or species, waste of precious resources — all these will be seen as the unnecessary and harmful actions they are and will be shunned and considered akin to personally assaulting a fellow human. Perhaps most important, environmental science — rather than short-term and overly

simplified economics — will underpin decisions about emissions, production technologies, energy sources, and lifestyles.

It seems fair to say that without these fundamental changes, we may not be thriving in 2049.

Peter Lehner is Executive Director of the Natural Resources Defense Council.

On One Hand, Danger, On the Other, Security

JAMES GUSTAVE SPETH

By mid-century we will know, as Bill McKibben has put it, whether the big brain was really a good idea after all. Two futures can be sketched, with lots of gradations in between.

In one, societies will have continued to neglect global-scale environmental challenges, environmental treaties will have continued to be largely ineffectual, and the environmental community will have continued to be no match for the powerful dynamics of corporate-consumer capitalism — or at least these patterns will have persisted far too long into the future. Here, environmental law will be a law of coping with crisis and urgent remediation, a law of draconian measures manipulated by elites to preserve economic privilege and access to resources and amenity, the law of fortress world and resource wars and conflicts, a law regularly invoked to override human rights and civil liberties in the name of security and good order.

In the other, environmental concern will have powerfully manifest itself in a host of other arenas — in the law of politics, in corporate law, in consumer law, in tax law, in energy law, in international law, in banking and finance law, and so on — and environment will have been a key

driver for deep, transformative change in these areas, change that takes us beyond today's political economy. Environmental requirements will be seen as fundamental human rights, environmental neglect a serious offense against society, waste something that is strictly forbidden. New laws will require rigorous pre-market assessment of technology; will promote ecological modernization at an unprecedented rate; and will ensure honest, full-cost prices while sharply curbing market forces in the public interest. Of particular importance will be policies that temper economic growth while improving social and environmental well-being — policies establishing, for instance, shorter work weeks and longer vacations; greater labor protections, job security, and benefits; restrictions on advertising; a new design for the 21st century corporation, one that embraces rechartering and stakeholder primacy rather than shareholder primacy; rigorous environmental, health, and consumer protection; greater economic and social equality; heavy spending on public services; and initiatives to address population growth at home and abroad.

Either way, 2049 will not be a good year for libertarians.

James Gustave Speth is leaving his position as Dean of the Yale School of Forestry and Environmental Studies to become a professor at Vermont Law School.

Two Scenarios Offer Contrasting Futures for Field

MICHAEL P. VANDENBERGH

Today, we are at an inflexion point that will determine the state of the field in forty years. The climate challenge is sufficiently great that it will dominate other environmental concerns. The Intergovernmental Panel

on Climate Change projects that our business-as-usual course will lead to doubling atmospheric concentrations of greenhouse gases by 2049 and temperatures that yield substantial risks of catastrophe. The projected population will be 9 billion, which sounds absurdly high until you realize that we will likely hit 7 billion by 2011.

The optimistic scenario for the next forty years is that we will follow the pattern of the first forty: large public support generating a strong and largely successful law and policy response over the first decade, followed by relatively minor tweaking as the system is implemented. If this occurs, the field of environmental protection will look much as it does today, although the wide range of current environmental efforts, whether addressing water pollution, air pollution, toxics, endangered species, or natural resources, will be subordinate to mitigating and adapting to climate change.

The less optimistic scenario is that the public will not support a sufficiently strong response to generate major reductions in projected global carbon emissions in the near term, we will only adopt half measures, and we will tuck on additional measures every several years as the climate science becomes more certain and the inadequacy of existing measures becomes more apparent. This is the more likely scenario.

What will the field of environmental protection look like in 2049 in this scenario? Perhaps it will look as though the frightening predictions that motivated the first decade of environmental law were not wrong, they were simply premature. Environmental protection at that point will involve adaptation to a changing climate, evaluating geo-engineering options, and addressing disputes over competition for increasingly scarce resources.

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