Aquaculture Law: Pollution or Promise

Student Scholarship Feature

By Sarah Newkirk

In recent decades, declines in the numbers of wild fish stocks have forced the marketers and consumers of seafood to look elsewhere for a reliable source of certain types of fish. Aquaculture, or fish farming, has emerged as an alternative to traditional fishing. Advocates of aquaculture claim that it is cheap, clean, and has the potential to be the solution to many of the world’s food shortages. However, environmentalists worry that aquaculture may cause more environmental problems than it solves.

Existing legislation and regulations on the federal, state, and local levels address various potential environmental hazards of aquaculture, but in a confusing and incomplete way. Moreover, the United States’ policy of encouraging the development of aquaculture by reducing the regulatory constraints on aquaculturists conflicts directly with the interest in protecting our marine and aquatic environment.

Aquaculture, Page 6

Indian Point Nuclear Leak Puts Sale of Aging Reactors Into Question

By Ed Smeloff

The February 15 accident at the Indian Point 2 power plant reveals a troubling tension between safety and economics at the 26 year-old nuclear facility located on the Hudson River in Buchanan, New York.

The accident raises serious questions about earlier decisions made by the plant’s owner, Con Ed, regarding the critical component that leaked radiation, the plant’s steam generators. The steam generators contain thousands of metal tubes that carry radioactive water at 550 degrees fahrenheit and 2,200 pounds per square inch pressure. It was one of these tubes that ruptured and contaminated the normally radiation-free steam that powers a turbine-generator which produces electricity.

What is troubling about this accident is that Con Ed petitioned and the Nuclear Regulatory Commission (NRC) granted a waiver to inspect these steam generators nearly a year ago. The

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Vieques and the US Navy: Is it Settled?

By José L. Ramírez de León and Alejandro Torres Rivera

On January 31, 2000, the Governor of Puerto Rico, Hon. Pedro Rosselló-González, in his annual message to the Puerto Rico Legislature, announced an agreement with President Clinton, which, he said, “will bring at last peace for Vieques.” The agreement consisted of an offer from the President to issue a Presidential Directive, and the Governor’s written response to accept it. The announcement was followed by an unprecedented address by President Clinton to the people of Puerto Rico, outlining his Directive and asking the Puerto Ricans to support it.

At first, the details of the agreement were sketchy, and the public’s reaction to it was lukewarm at best. Nevertheless, as soon as the details of the Directive were known, wide sectors of Puerto Rican society began to distance themselves from the
Tarlock Delivers Garrison Lecture
Distinguished Professor Dan Tarlock of the Chicago-Kent College of Law, Illinois Institute of Technology, delivered the annual Garrison Lecture at Pace to an enthusiastic audience. The lecture was entitled, “Rule of Law: Environmental Litigation: Will It Continue to Perform Its Historic Function.”

Miller Quizzed on Capitol Hill
Professor Jeffrey Miller, James Hopkins Professor of Law, testified before a joint session of two subcommittees of the House Committee on Science and Committee on Government Reform, in October on whether the Clean Air Act can or should be interpreted to make carbon dioxide a pollutant and, if so, whether it can or should be interpreted to give EPA authority to regulate carbon dioxide emissions. Professor Miller was invited to testify by the Committee at the suggestion of the General Counsel of the Environmental Protection Agency.

Robinson in UN Post
Kerlin Distinguished Professor Nicholas A. Robinson’s has been appointed as the Legal Advisor to the Office of Permanent Observer Mission of the IUCN (The World Conservation Union). The IUCN was recently granted Permanent Observer Status by unanimous vote of the members of the General Assembly. Ambassador Bhagwat Singh will serve as Permanent Observer.

Some Dates to Save
--The Annual Animals and the Law Conference, Animal Rights and Other Social Justice Movements in the New Millennium will be held on April 8, 2000.


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A River Does Run Through It!

By Robert J. Goldstein

Rummaging through an antique store last year, I purchased an old map of the town of Mount Pleasant in Westchester, New York, where I live. It was undated, and I have since guessed that it is over 120 years old, since shows the Croton Aqueduct, complete in 1842, but not the Putnam Railroad that opened in the 1880s. The map is remarkable, not for its old age, but rather for its depiction of a physical landscape all but unrecognizable today. Missing are most of the monuments to our engineering and construction prowess, save for two rail lines and the aqueduct. Natural features predominate on this map despite its depiction of each individual dwelling and business in the town. In the aftermath of the devastating flooding from tropical storm Floyd, I pulled out the map and was amazed to learn how accurate the map really was.

In Mount Pleasant, certainly not the hardest hit of the northern New York suburbs, Floyd dumped upwards of eight inches of rain in a very short time. Motorists fleeing flooding waters abandoned cars; houses and businesses were flooded; and roads collapsed from the torrents of ordinarily trickling streams.

The Pocantico River, as depicted on my old map, is by any account, a distinguishing feature. It runs free for most of its length, originating in the mountains of the neighboring town of New Castle, and running south and then southwest through Sleepy Hollow — of Washington Irving fame. Outside of Beekmantown (later North Tarrytown, now Sleepy Hollow), mills impound the river into two ponds, and it heads west toward an odd hooked-shaped spit of land jutting into the mighty Hudson River. Finally turning due south, the river, whose name is now synonymous with the sprawling estates of the Rockefellers in nearby Pocantico Hills, enters the Hudson.

The river is difficult to find on modern maps amid the highways and shopping malls that dominate in this era of suburban sprawl. The detailed US Geological Survey topographic map shows the river with a reservoir called Pocantico Lake bulging near its midpoint. Most maps omit it entirely.

Up until Floyd hit, the river was harder to find on the ground. Channeled by culverts and ditches, completely covered over by roads, and diverted into reservoirs, it is hard to identify even as you cross it. When you do find it, for the short lengths you can follow it, storm drain run-off dominates its flow, and its course sometimes dictated by corrugated steel pipes.

Of the many roads crossing the Pocantico, most, if not all, fail to identify it to passing motorists. Many crossings are made without any indication whatsoever, that water is passing beneath the road. It was in several such locations that Floyd attacked the constraints put on the Pocantico with a vengeance, tearing apart the culverts and the roads above them with raging floodwaters.

Viewing the wreckage, strewn astride of the still swollen river, one is in awe of the power generated by this usually tender brook. The road, collapsed into the river, appears to be sliced from its bank, a circular pit with a twenty-foot diameter appears to have been carved by an eddy that developed immediately above the collapse, evidently from the water that was impounded prior to its undermining of the culvert. The culvert itself, now detached from the roadway, is a pitifully small pair of rectangular openings, apparently designed to keep the flow low, and maintain the level appearance of the road.

Surely this was not the most devastating of the rivers revealed by Floyd, but it may have been the least malevolent, forced to rise in its full fury to wrest itself from its man-made shackles.

We make great efforts to pave over natural features, to flatten land, to provide parking spaces on wetlands that once buffered flooding, to wedge new homes into locations that require the burying of watercourses. The paving both decreases the area that might absorb the rainfall, and smothers physical features that developed to naturally drain waters.

There are two responses to this type of wake-up call. We can once again attempt to muscle nature, repaving over the rivers, and squeezing them into courses that are convenient, or we can recognize that nature will take its own course, and learn to adjust our need for development to the natural landscape.

If you are not swayed by the results of the flooding, I feel constrained to mention the fact that Floyd and his counterparts, may well be exacerbated by climate change, for which we too may bear responsibility, or suffer the consequences.

Non-Point Sources, continued from Page 2
Thursday, April 13: Earth Day Celebration, day-long celebration with music, food, fun and games. Preston Quad.

Thursday, April 13: Symposium: Solving the Acid Raid Dilemma. Moderated by Professor Nicholas A. Robinson, this Symposium features Commissioner John Cahill, NYS Department of Environmental Conservation, Professor David Sive, Dr. Kathleen Weathers, Institute for Ecosystem Studies, and NYS Assemblyman Richard Brodsky. RSVP for this event at earthday2000@law.pace.edu or 914-422-4136.

-- The Environmental Alumni Welcome Brunch will be held on Sunday, September 24, 2000, at the Jay Heritage Center in Rye.

--The Gilbert and Sarah Kerlin Lecture in Environmental Law will feature Carol M. Rose, Gordon Bradford Tweedy Professor of Law and Organization at Yale Law School, and is slated for September 2000.

--The 7th Annual Garrison Lecture will feature Professor Gerald Torres, and will be held in March of 2001. Past Lecturers include: David Sive, Bill Rogers, Joseph Sax, Oliver Houck, Richard Lazarus, and Dan Tarlock.
Global Biosafety Agreement Reached in Montreal

UNEP--Chatelaine, Switzerland

After five years of talks, ministers and senior officials from over 130 governments have finalized a legally binding agreement for protecting the environment from risks posed by the transboundary transport of living modified organisms (LMOs) created by modern biotechnology.

Under the Cartagena Protocol on Biosafety, governments will signal whether or not they are willing to accept imports of agricultural commodities that include LMOs by communicating their decision to the world community via an Internet-based Biosafety Clearing House. In addition, shipments of these commodities that may contain LMOs are to be clearly labelled.

Stricter Advanced Informed Agreement procedures will apply to seeds, live fish, and other LMOs that are to be intentionally introduced into the environment. In these cases, the exporter must provide detailed information to each importing country in advance of the first shipment, and the importer must then authorize the shipment. The aim is to ensure that recipient countries have both the opportunity and the capacity to assess risks involving the products of modern biotechnology.

One of the most contentious issues that negotiators had to resolve involved the relationship between the Protocol and other international agreements, notably those under the World Trade Organization. While environmental agreements are premised on the precautionary principle (which states that potentially dangerous activities can be restricted or prohibited even before they can be scientifically proven to cause serious damage), decisions under trade law require “sufficient scientific evidence.” Under this agreement, the Protocol and the WTO are to be mutually supportive; at the same time, the Protocol is not to affect the rights and obligations of governments under any existing international agreements.

The meeting was attended by over 700 delegates from governments as well as from intergovernmental and non-governmental organizations. Over 40 ministers attended during the final two days. The agreed text of the Biosafety Protocol will be opened for signature at UNEP headquarters in Nairobi from 15-26 May. The Protocol will then enter into force for its members after 50 countries have ratified it.

LMOs include various food crops that have been genetically modified for greater productivity or nutritional value, or for resistance to pests or diseases. Common examples include tomatoes, grains, cassava, corn, and soybeans. Seeds for growing crops are particularly important because they are used intentionally to propagate or reproduce LMOs in the environment.

Together, these agricultural LMOs form the basis of a multi-billion-dollar global industry. Pharmaceuticals derived using LMOs form the basis of an even larger industry (although pharmaceuticals are not covered by this agreement).

This success marks the end of a lengthy negotiating process that started in 1996. The biosafety talks had to be suspended in February 1999, in Cartagena, Colombia, when officials were unable to finalize the text of a protocol.

The biosafety agreement reflects growing public concerns about the potential risks of biotechnology. Many countries with modern biotechnology industries do have domestic legislation. However, there are no binding international agreements covering LMOs that cross national borders because of trade or accidental releases.

Another concern is that many developing countries lack the technical, financial, institutional, and human resources to address biosafety. They need greater capacity for assessing and managing risks, establishing adequate information systems, and developing expert human resources in biotechnology.

The January 31, 2000 Presidential Directive, is addressed to the Secretary of Defense (DOD) and to the Director of the Office of Management and Budget (OMB). Entitled, “Resolution Regarding Use of the Range Facilities on Vieques (Referendum),” the Directive states that “the future of Navy training on Vieques will be determined by a referendum of the registered voters of Vieques, using Puerto Rico electoral laws and regulations as they exist on the date of this directive.” The referendum was set for May 1, 2001, “or 270 days prior to or following May 1, 2001, the exact date to be specified on the request of the Department of the Navy.”

The Directive orders that the referendum “will present two alternatives. The first is that the Navy will cease all training no later than May 1, 2003. The second will permit continued training, including live fire training, on terms proposed by the Navy.” The Directive orders the OMB to separate the amount of $40 million for “immediate investment” in the island of Vieques. This “investment is chiefly for “road reparations, pier and airport expansions” for “economic stimulation” and for the stockpiling of ammunition and ordnance. “This investment” will take place regardless of the result of the referendum.

Until the referendum is held, the Navy will keep training in the eastern range of the island, using solely non-explosive ordnance better known as “inert bombs.” Periods of training will be shortened, from the current 270 days to 90 days per year. If the Vieques population chooses the second option (training with live stock)
Aquaculture, continued from Page 1

Unifying legislation is required which regulates aquaculture, as an industry, coordinating discharge limitations with protections against introduced species. Existing legislation is insufficient for this purpose.

This paper will present a background on the United States aquaculture industry, discuss the environmental hazards of aquaculture, review several federal laws which regulate aquaculturists, and propose new legislation to better protect the environment.

Background

Aquaculture is the practice of rearing fish, shellfish, or plants in water. The practice was developed in China between 3500 and 4000 years ago. Aquaculture has received increased attention in this country in recent years in response to the overexploitation of many of our wild fisheries, and the realization that the wild stocks cannot support current levels of fishing pressure. As a result, aquaculture is currently the fastest growing agricultural sector in the United States.

Accordingly, the seafood we consume is increasingly the product of aquaculture. “More than 100 species of aquatic organisms are farmed in the United States” today. Virtually all of the catfish and rainbow trout, about half the shrimp, and approximately one-third of all salmon consumed in the United States is farm-raised rather than caught in the ocean. Worldwide, aquaculture production has more than doubled since 1984 reaching a peak of 20,900,000 metric tons in 1995. Aquaculture currently accounts for 27% of seafood consumed worldwide.

It is likely that the coming years will witness a continued increase in the demand for aquaculture products. Consumption of seafood is on the rise and the availability of natural stocks is in decline. Aquaculture may be able to satisfy increasing demand with a high-quality product on a consistent basis. In addition, the aquaculture industry can provide jobs for fishermen displaced by the wild stock decline.

The Aquaculture Industry

The North American aquaculture industry produced nearly half-a-million metric tons in 1995, the latest year for which this information is available. Of this, the United States was responsible for over 450,000 metric tons of production. Catfish (*Ictalurus punctatus*) is the primary cultured species in the United States, accounting for 43% of total North American production. Shellfish are also a large fraction of total production, with oysters accounting for 25%, crayfish 6%, and clams and mussels 5%. However, production of finfish other than catfish is on the rise. In 1995 tilapia production had risen to 7,000 metric tons, from an annual production of 20 metric tons in 1988, at an annual percentage rate (APR) of 130. Salmon and striped bass production is also showing a substantial increase, with striped bass increasing at an APR of 108 and salmon increasing at an APR of 129. Canadian aquaculture is entirely marine, and consists primarily of salmon but also includes oysters, mussels, and rainbow trout.

Despite these high levels of production, the United States is heavily dependent on imported seafood, second only to Japan in overall fisheries imports. The Department of Commerce estimates that demand for seafood in the United States will increase to 1.4 million metric tons by 2000, based on population growth alone. Indeed, in 1989, the U.S. imported sixty percent of the seafood it consumed. Because of the widening trade gap in seafood products, the U.S. government has made a concerted effort to strengthen the aquaculture industry through legislation, policy, and subsidy. For example, the National Aquaculture Act of 1980 was passed to declare a national aquaculture policy of encouraging aquaculture development in both the public and private sectors. Additionally, for the purposes of the Farmers Home Administration, aquaculturists qualify as farmers and are thereby eligible for financial assistance. Finally, under the Federal Crop Insurance Act, aquaculture products qualify as an “agricultural commodity.” and aquaculture operations are therefore eligible for crop insurance. Estimates suggest that efforts at expanding U.S. aquaculture production are working, and aquaculture will be responsible for between two and three billion pounds of production by the year 2000.

Aquaculture methods vary with species and geographic region. Shellfish aquaculture employs either bottom culture methods, or off-bottom methods. In the case of bottom culture, the aquaculturist places net-covered nursery trays containing juvenile shellfish on the ocean bottom, often in the intertidal zone. Here, the shellfish grow to harvestable size, at which time they are collected by hand. Off-bottom methods involve the use of suspended cages, attached to rafts which float on the surface. Finfish aquaculture is accomplished through the use of either cylindrical tanks or net-pens, which are anchored to the bottom, generally in areas protected from storm activity.

Environmental Problems

Fishmeal

Nearly thirty percent of the world’s wild fisheries production is currently converted to fishmeal. Most fishmeal is used to feed terrestrial animals, such as hogs and poultry, but a significant amount (15%) goes to making aquaculture feed. The use of fishmeal as aquaculture feed can result in a net loss of protein; in other words, it requires more fish protein to feed the cultured species than is ultimately produced for human consumption. For example, growing one pound of farmed salmon may require three to five pounds of wild fish. In addition to being inefficient, this practice puts tremendous pressure on the stocks of small schooling fishes principally used to produce fishmeal, such as anchovy, herring, and sardine.

Eutrophication

Aquaculture facilities produce large quantities of waste organic material in the form of excess feed and fish feces. These wastes are generally discharged directly into natural water bodies. The presence of high concentrations of...
organic material can lead to algal blooms.\textsuperscript{42} When the algae die, their decomposition can lead to drastic reductions in oxygen levels, causing physiological stress to fish and other organisms inhabiting the water body.\textsuperscript{43}

\textbf{Introduced Species}

The introduction of non-native species into an area, whether accidental or deliberate, can be the source of a variety of environmental harms.\textsuperscript{44} Aquaculture facilities are not impervious to their inhabitants, and often very large numbers of fish escape, particularly from netpen facilities.\textsuperscript{45} “[A]lmost 100,000 Atlantic Salmon escaped in the summer of 1996 from the relatively small netpen industry in the state of Washington.”\textsuperscript{46}

One harm that can result from these introductions is the proliferation of an introduced species which competes with an indigenous species, leading to the decline or disappearance of the indigenous species.\textsuperscript{47} A second potential harm is the spread of diseases and parasites, to which native species are especially susceptible.\textsuperscript{48} Finally, alteration of the genetic makeup of the wild stock may result from the interbreeding of escaped cultured fish with wild fish.\textsuperscript{49} This genetic “pollution” can be illustrated by the condition of Atlantic salmon:

Wild Atlantic salmon are characterized by a large number of genetically distinct populations that are adapted to the specific conditions of the local river systems to which they return to spawn. In contrast, cultured Atlantic salmon are bred to be very uniform genetically and to exhibit favorable production traits, such as rapid growth and low aggressiveness. Interbreeding between wild and farmed Atlantic salmon introduces new combinations of genes to genetically distinct populations of wild salmon, and may break up local genetic adaptations that are critical to the survival of wild salmon in different rivers.\textsuperscript{50}

\textbf{Regulation of Aquaculture}

Many aspects of aquaculture, especially the siting of aquaculture facilities and their discharges once in operation, are currently regulated. Legislation affecting aquaculture may take the form of federal, state, or local laws. On the federal level, there is a wide array of regulatory measures about which aquaculturists must be concerned. Several of these are reviewed here.

\textit{Federal Rivers and Harbors Act}

The primary piece of federal legislation which impacts the siting of aquaculture facilities is the Federal Rivers and Harbors Act (“FRHA”).\textsuperscript{51} Under the FRHA, the U.S. Army Corps of Engineers must authorize any project that involves the placement of any structure that would create an obstruction in any navigable water of the United States.\textsuperscript{52} The Corps must subject proposed projects to a “public interest review,” in which they balance all reasonably expected benefits of the project against all reasonably expected detriments, including environmental, economic, aesthetic, navigation, property rights, and international interests.\textsuperscript{53} The Outer Continental Shelf Lands Act amended the FRHA, extending the Corps jurisdiction beyond the territorial waters to include the outer continental shelf.\textsuperscript{54} The Acts allow the Corps to regulate devices permanently or temporarily attached to the sea floor.\textsuperscript{55} This potentially regulates the siting of both near-shore and open ocean aquaculture facilities.

\textbf{Legislation affecting aquaculture may take the form of federal, state, or local laws. On the federal level, there is a wide array of regulatory measures about which aquaculturists must be concerned.}

\textbf{Coastal Zone Management Act}

The Coastal Zone Management Act (“CZMA”) further constrains the siting of aquaculture facilities in the coastal zone. The primary goal of the CZMA is the regulation of construction and development in the coastal zone.\textsuperscript{56} The act is a cooperative federal and state effort, in which the federal government provides grants for states to develop Coastal Management Plans (“CMPs”).\textsuperscript{57} Following the creation of its CMP, the state has control over licensing, development, and uses of the coastal zone.\textsuperscript{58} Twenty-four coastal states have federally-approved CMPs, which vary in degree of control over coastal activities.\textsuperscript{59} Florida’s CMP employs a very broad definition of “coastal zone,” such that it regulates most of the state.\textsuperscript{60} Thus, almost all aquaculturists, whether freshwater or marine, must comply with the CMP and obtain various permits prior to establishing their operation.\textsuperscript{61} Mississippi’s CMP, by contrast, covers only its 3 coastal counties. Because 96 percent of the state’s aquaculture facilities are coastal, Mississippi’s CMP fails to regulate the vast majority of these operations.\textsuperscript{62} Moreover, Mississippi has a history of exempting catfish operations to which the CMP would otherwise apply.\textsuperscript{63}

\textbf{Clean Water Act}

The Clean Water Act regulates aquaculture at both the siting stage and the operational stage. The basic prohibition of the Clean Water Act is that “the discharge of any pollutant by any person shall be unlawful.”\textsuperscript{64} Generally, this prohibition is implemented through the National Pollution Discharge Elimination System (NPDES), which issues permits imposing limits on the amount which may be discharged by individual dischargers.\textsuperscript{65} EPA controls the issuance of NPDES permits, unless an individual state develops a permitting program which is approved by EPA, in which case the authority to grant permits is delegated to the state.\textsuperscript{66} In circumstances where permitting authority is retained by EPA, permitting is still subject to regulation.
view by the state. 68

The NPDES program only regulates discharge from a point source. 69 “Concentrated Aquatic Animal Production Facilities” are point sources. 70 The decision to categorize a facility as a concentrated aquatic animal production facility is made based on several criteria: “(i) The location and quality of the affected water; (ii) The holding, feeding, and production capacities of the facility; (iii) The quantity and nature of the pollutants; and (iv) Other relevant factors.” 71 Under these criteria, most aquaculture facilities qualify as “concentrated aquatic animal production facilities, and are therefore classified as point sources and must seek NPDES permits. 72

The Clean Water Act may also impact the siting of aquaculture facilities through its wetlands protection program. Under this program, which is administered by the Army Corps of Engineers, any dredge and fill activities in wetland areas must receive federal approval under the permitting system. 73 EPA retains full veto authority over any permit issued by the Corps under this program. 74 States may also regulate activities in wetland areas, and the degree of severity of these regulations vary from state to state. 75 “Fully two-thirds of commercially harvested fish in the United States waters depend on wetlands for food or spawning and rearing grounds.” 76 As such, many aquaculture facilities are located in wetland areas and are subject to these restraints.

Ocean Dumping Act

The Ocean Dumping Act 77 gives EPA the authority to regulate dumping of material into the ocean in the outer continental shelf area, beyond the territorial sea. 78 The Act does not regulate nearshore activities, and, as a result, most aquaculture facilities are not impacted. As the interest in open ocean aquaculture grows, the importance of the Act in regulating aquaculture may grow with it. 79 However, the definition of dumping under the Act exempts materials when they are deposited for the purpose of “developing, maintaining or harvesting fisheries resources and [are] otherwise regulated by federal or state law or occur pursuant to an authorized federal or state program.” 80 Those aquaculture facilities that are otherwise regulated by the Clean Water Act or the Rivers and Harbors Act will generally be exempt from the Ocean Dumping Act. 81

The National Aquaculture Act

The National Aquaculture Act 82 was passed in 1980 with the primary intent of promoting the economic development of aquaculture. 83 The Act designated the Department of Agriculture as the lead agency, with responsibility for dissemination of information on national aquaculture activities. 84 The Secretary of Agriculture was to establish, in consultation with the Secretaries of Commerce and Interior, a National Aquaculture Development Plan. 85 The National Aquaculture Development Plan was completed in 1996. 86 The Plan laments the complex and disjointed set of legislative and regulatory constraints which may affect the activities of aquaculturists, and suggests that such complexity serves to discourage participation in the aquaculture industry. 87 The Plan sets forth a framework for action and makes improvement of the federal regulatory framework a national priority. 88 Finally, the Act established the Joint Subcommittee on Aquaculture, which was to provide coordination and make recommendations for improving national aquaculture policy, including the identification of regulatory constraints to aquaculture and recommendations for ways to reduce such constraints. 89

Analysis

Aquaculture is an important industry, both in the United States and globally. There has been a great deal of optimism from government and the private sector over aquaculture’s potential to provide an affordable, nutritious food source to poor and developing nations as well as its potential to protect wild fish stocks from further over-exploitation. This enthusiasm over aquaculture almost ensures the continued expansion of the industry.

However, the aquaculture industry is not without problems. Many of the environmental hazards posed by aquaculture are similar to those posed by terrestrial agriculture, especially with respect to nutrient overloading and the application of chemicals. The threat of introduction of exotic species into habitats in which they are able to outcompete indigenous species presents potential biodiversity and species-loss problems. Finally, the use of fishmeal to feed cultured species results in the net loss of protein in a protein-poor world. Many of the species used to produce fishmeal are independently edible, and are available at a substantially lower cost than the products of aquaculture. Additionally, the huge quantities of these forage species that must be taken to produce adequate fishmeal negatively impact the stock of the forage species themselves, as well as the stocks of the predator species that consume them.

The potential risks posed by a large and growing aquaculture industry attest to the need for a coordinated regulatory framework through which these environmental hazards may be minimized. Existing legislation regulating the aquaculture industry is diverse and confusing. This paper has reviewed five pieces of major federal legislation about which aquaculturists must be aware; however, other federal legis-
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The National Aquaculture Act was the first piece of federal legislation to address, wholistically, the aquaculture industry. Although the Act requires dissemination of information on aquaculture, requirements beyond this, if any, are vague. Moreover, the intent of the Act is to study the legislation and regulations impacting aquaculture with the intent of reducing this regulatory impact, so as to make the industry more attractive to prospective aquaculturists. As a result, whatever the coordinating function of the National Aquaculture Act, it does not serve to protect the environment and indeed seeks to minimize the business and economic difficulties of aquaculture at the expense of the environment.

There is a clear need for unifying legislation which addresses the environmental problems of aquaculture while continuing to encourage the development of the industry. Such legislation would have two major sections. The first would focus on water quality. Development of the industry. Such legislation should be created which addresses the environmental problems of aquaculture, including fisheries legislation, like the Magnuson-Stevens Fishery Conservation and Management Act, may apply to aquaculture operations as well. In addition, innumerable state and local laws further regulate the industry. This complex mire of law notwithstanding, it is apparent that there is no current mechanism for control over the introduction of exotics or the devastation of forage species for use in fishmeal. The discharge of substances from an aquaculture facility is regulated by a confusing array of statutes and regulations at many different levels of government. The siting of aquaculture facilities is also regulated, but the primary concern of these controls is the protection of navigation and coastal aesthetics, rather than the protection of the environment.

Aquaculture provides benefits to humans as a food source and to wild aquatic organisms as an alternative to large-scale fishing. The development of aquaculture should be encouraged. However, the environmental detriments of aquaculture should be acknowledged and addressed. New legislation which regulate aquaculture are many. This system provides a single set of regulations with which aquaculture facilities, once established, would need to comply. Second, the unification of water quality regulations affecting the industry would allow regulators to more effectively monitor discharge from these facilities. These provisions would also allow for the regulation of discharges, such as escapes, which would not otherwise be managed. The establishment of grants for the development of "environmentally friendly" aquaculture techniques will allow the industry to continue its development in a non-destructive direction.

Finally, the National Aquaculture Act should be repealed. The NAA creates an unnecessary conflict of interest between the development of the aquaculture industry and the protection of the environment. Wise legislation, such as that proposed above, can encourage the development of the industry without forsaking our national commitment to the environment.

Conclusion

Footnotes


4 See Rychlak and Peel, supra note 2 at 838.

5 Joint Subcomm. on Aquacul-Aquaculture, Continues
AQUACULTURE


7 See id.

8 See id. 1995 is the latest date for which these statistics are available. See <http://www.fao.org/waicent>

9 See id.


11 Barbara Carton, From the Farm to the Table: An Alternative Way to Harvest Fish Captures the Market, The BOSTON GLOBE, Apr. 27, 1994, at 54.


14 See id.

15 See id.

16 See id.

17 See id.

18 See id.

19 See id.


21 See id at 1.4.3.

22 See Rychlak and Peiel, supra note 2, at 838.


25 See Rychlak and Peiel, supra note 2, at 841.


27 See id at § 1518.

28 See id at § 1508.

29 See id. at 842.

30 See Marston, supra note 10, at 352.

31 See id.

32 See id.

33 See id. at 353.

34 See id.

35 See Goldberg and Triplet, supra note 6.

36 See R.W. Hardy, Sustainable Aquaculture and Aquatic Feeds, AQUACULTURE MAGAZINE, March/April, 1997, at 72.

37 See Goldberg and Triplet, supra note 6.

38 See id.

39 See id.


41 See id.


43 See id.

44 See Goldberg and Triplet, supra note 6.

45 See id.

46 See id.


49 See Goldberg and Triplet, supra note 5.

50 See id.


52 See id. See also 33 C.F.R. § 329.4 (1995).


59 See Rychlak and Peiel, supra note 2, at 845.

60 See id.

61 See id.

62 See id at 846.

63 See id.

64 See id.


67 See id.


70 See 40 C.F.R. § 122.24(b) (1995).


75 See Rychlak and Peiel, supra note 1, at 848-849.


79 See Hopkins, Goldberg and Marston, supra note 56 at 246.


81 See id.


83 See Hopkins, Goldberg and Marston, supra note 56 at 249.

84 See id.


86 DRAFT NATIONAL AQUACULTURE DEVELOPMENT PLAN, supra note 20.
areas, and do not favor their with-
ners presently occupying the restricted
Vieques people support the protest-
get out immediately. 83% of the
years, while 34% want the Navy to
percent want the pull out within three
additional $50 million.  Of the 96%
ammunition for payment of the ad-
doubts about the Navy's intentions
Clinton's offer.  They expressed
before
have consulted the Vieques people
thing was handled by Gov.
Governor, Hon. Sila M. Calderón-Serra.
Importantly, polls taken in
Vieques immediately after the Direc-
tive was announced reflect almost a
universal disapproval of the way the
matter was handled by Gov. Rosselló. Out of a voting population
of 5,000 adults, 300 were inter-
viewed, and 95% of those felt that
the Puerto Rico government should
have consulted the Vieques people
before it accepted the Navy’s and
Clinton’s offer.  They expressed
doubts about the Navy’s intentions
and only 4% favored the continua-
tion of the bombardment with live
ammunition for payment of the ad-
ditional $50 million. Of the 96%
who favor the Navy withdrawal, 55%
percent want the pull out within three
years, while 34% want the Navy to
get out immediately. 83% of the
Vieques people support the protest-
ers presently occupying the restricted
areas, and do not favor their with-
drawal.
Most observers agree that the
Presidential Directive has some fund-
damental flaws.
There are several reasons why the
Directive, and the “agreement,”
which attempt to settle the Vieques
issue, should be considered as not sats-
factory to most Puerto Ricans:
1. It barely differs from earlier
offers made by the White House and
the Pentagon to the Government of
Puerto Rico. The only difference is
that this Directive reduces the “period
of transition” from five to three years.
However, the Directive allows the
Navy to resume, for 90 days per year,
its bombardment practices in the area
called “Inner Range Atlantic Fleet
Weapons Training Facility”
(“AFWTF”), located on the premises
currently being occupied by activ-
ists in civil disobedience in the east-
ern quarter of Vieques. Under the
Directive, the Navy could do, twice a
year, the exercises for its Atlantic
Fleet, known as JTFE (“Joint Task
Force Exercise”), on periods of 45
days each.  Such practices would
return the eastern quarter of Vieques to
desolation, destruction and environ-
mental deterioration which were the
norm before the Navy decided to in-
definitely stop all exercises nearly one
year ago.
2. The Directive would allow the
use of the area denominated “East-
ern Maneuver Area” (“EMA”), lo-
cated in the eastern portion of
Vieques. In this area the Navy con-
ducts the US Marine Corps’ amphibi-
sous exercises where Forces for Rapid
Deployment participate, which ac-
company the several Task Forces
from the different carriers that sail
every six months from Norfolk, Vir-
ginia, as part of the “Composite Train-
ing Unit Exercise” (“COMTUEX”).
The final phase of these exercises in
the JTFE exercise mentioned above,
includes the combined maneuvers of
bombing and landing in Vieques.
3. The absence of references to
the use of the EMA by the Marine
Corps in the Directive, opens the door
to the utilization of those lands not
only by the Corps, but also by the
“Southern Command’s Special Op-
erations Command South”
(“SOCSOUTH”); by the Southern
Command’s garrison in Puerto Rico,
which is the Army Command South,
with headquarters in Fort Buchanan,
Puerto Rico; as well as by the sev-
eral military and naval forces from
the several countries in the region,
under the jurisdiction of the South-
ern Command, and with which the US
conducts different kinds of training.
Ships from naval forces of Colombia,
Venezuela, Uruguay, Canada, France
and Netherlands, along with a squad-
ron of additional destroyers from the
United States will be participating in
a “war game” with the combat group
headed by the carrier George Wash-
ington. This “war game” will take
place in waters near the island of
Vieques, between the US Virgin Is-
lands and Puerto Rico, in the so-
called Caribbean regional exercises,
“UNITAS”.
4. The Directive facilitates the
transfer and puts into the disposition
of the Southern Command the facili-
ties at Roosevelt Roads to accommo-
date the headquarters of the Naval
Forces of the Southern Command
(“NAVYSOUTH”). The presence of
this naval force anticipates the devel-
opment of its operations in Vieques
lands and waters.
5. No enforcement or verifica-
tion mechanisms by which the gov-
ernment of Puerto Rico would over-
see the compliance by the Navy or
the military during the next three
years were negotiated or established
in the Directive.
6. The Directive neither spe-
cifies nor defines the level of enforce-
ment that the Government of Puerto
Rico would have in the oversight of
the cleanup and decontamination pro-
cedures of the polluted lands and
waters in the western portion of
Vieques that are earmarked to be
transferred to the Commonwealth
under the Directive. In this portion
of Vieques, there are no less than 104
explosive and ordnance storages from
the Atlantic Fleet. There are tens of
thousands of bombs of different sizes
Energy Efficiency

Alternatives to Battle Climate Change

By Richard L. Ottinger & Mindy Jayne

There is no greater challenge to the future generations who will inherit our earth than to resolve the threats of global warming, identified by the consensus of world scientists through the International Panel on Climate Change (IPCC) as presenting unprecedented hazards of rising oceans, flooding and inundation of coastal areas, agricultural disruption, migration of tropical diseases and increased frequency and severity of storms. And no bigger undertaking has ever been attempted by the international community than to devise effective means of implementing the United Nations Framework Convention on Climate Change adopted in 1992 at the Rio Earth Summit to address these threats.

The International Panel on Climate Change (IPCC) identified emissions of carbon dioxide as the chief contributor to global warming. The principal remedy prescribed in Article 2 of the December 1997 Kyoto Protocol for implementation of the Rio Treaty is the adoption of clean energy solutions: energy efficiency enhancement in relevant sectors of national economies; increased use of renewable forms of energy; removal of fiscal incentives and subsidies promoting greenhouse gas emissions; and limitations and reductions of emissions.3

The burning of fossil fuels is the most significant source of carbon dioxide emissions worldwide. The principal problem with substitution of clean energy for fossil fuels is that the present use of them is so central to the world’s economies, fueling their electric utilities, industry, vehicles, heating and cooling of buildings, and often their household cooking. Developing countries have focussed on their economic development and the feeding, clothing, housing and health facilities for their populations, often regarding environ-mental improvements and clean energy as at best secondary priorities. But it is clear that the choice for developing countries is not social development or clean energy – if present growth trends in developing country energy demand continue, world resources quite simply will be inadequate to support their needs either for energy or development.4

Thus enormous economic and cultural barriers must be breached to shift from dependence on fossil fuels to clean energy resources. The perceived difficulties of this transformation were seen in the tortuous negotiations of the Kyoto protocols in 1997, and the small accomplishments achieved in the negotiations of COP 1-5 (Conferences of the Parties). These difficulties were evidenced by the modest goals recommended compared to what the IPCC scientists have identified as the carbon dioxide reductions needed to ameliorate global warming; the lack of mandatory reductions for developing countries (though many have done more than the industrialized countries to address climate change); and the problems, still unresolved, of adopting enforcement mechanisms and of getting the United States, the largest polluter, to ratify the Treaty.

The task of achieving the Kyoto carbon dioxide reduction goals, however, is not nearly as daunting or costly as some have made it appear. Many governments, utilities and private companies throughout the world have instituted measures that have achieved substantial carbon dioxide reductions. Many of these measures have been funded from internal sources; most have produced large net revenues by instituting more efficient processes and using more efficient products. As the world comes to realize the awesome threats and costs of global warming, many new initiatives are being taken in both the public and private sectors to address carbon dioxide emissions.

This is an excerpt of a paper that describes some of the measures that have been and can be taken to achieve a reduction in greenhouse gases.

Energy Efficiency Alternatives

Energy efficiency is assuredly the most effective and economically advantageous means of reducing carbon dioxide emissions and other energy-derived pollutants. Energy efficiency measures in the end use, manufacturing, and transmission of electricity can replace the need for fossil fuel resources and virtually always produce a net economic benefit, often substantial.5 Efficiency measures also can reduce the great costs and risks of dependence on oil imports.6 Many of the products required for efficiency measures can be produced domestically and have the potential for substantial export marketing.7 Moreover, by improving the efficiency of industrial processes, such measures often result in enhanced competitiveness of domestic production in our global economy.

The potential for reduction of carbon emissions through energy efficiency measures is enormous. It has been calculated that 60% of all primary energy used is lost in various stages of conversion and use, and that over 60% again is lost or wasted at the end-use stage.8 The IPCC, in 1998 made a similar calculation, finding that almost 71% of all primary energy used is wasted.9 Energy efficiency measures can economically avoid a large percentage of this waste.

Appliance Efficiency

Furnaces, boilers, air conditioners, heat pumps, refrigerators, water heaters, clothes washers and dryers, ranges and dishwashers consume 85% of energy consumption in the residential sector. 65% of energy use in the commercial sector is used for heating, cooling, lighting, water heating, refrigeration and office equipment. In the industrial sector, lighting equipment and electric motors account for more than 75% of electricity consumption.10 The tasks desired from these appliances can be furnished by much more efficient appliances, often using a fraction of the electricity used by less efficient, widely used models, and offering substantial savings to companies, consumers and...
CITES and Wildlife: Challenges Remain

By Guo Yinfeng

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was adopted in 1973 in Washington D.C. Numbering some 146 Parties, it is considered the most successful international treaty in the conservation of certain species of wildlife against over-exploitation through international trade.

In spite of the achievement, there are still grave concerns with its implementation. As a “hard” international law, CITES requires its member States, consumer and producer countries alike, to bear the treaty’s hard and precise responsibilities. However, the burden of conservation is disproportionately shared by developing countries under the current framework of CITES. The existing mechanism of trade control of Appendix II species best exemplifies this concern.

CITES framework

CITES controls the international trade in endangered species through a permit system operated by designated Management Authorities of each Party. Species under protection are listed in three appendices based on population status and potential threat from trade. Appendix I includes species threatened with extinction which are, or may be, affected by trade. Appendix II includes species which are not necessarily now threatened with extinction, but may become so if trade is not subject to control. Appendix III includes those species regulated domestically that require international cooperation of other parties in the control of trade.

With respect to Appendix II species, among other requirements, Article IV.2(a) provides that export permits may only be issued if a designated Scientific Authority of the Party concerned is satisfied that such export will not be detrimental to the survival of the species in question. Article IV.3 further authorizes the Scientific Authority to limit the export of any Appendix II species if this species throughout its range is not at a level consistent with its role in the ecosystems in which it occurs, which may otherwise render the species eligible for Appendix I listing. Different from requirements for Appendix I species, the export of Appendix II species does not need a mandatory import permit.

Article XIV.1 provides that the Convention shall in no way affect the right of Parties to adopt stricter domestic measures with respect to trade in Appendix-listed species, including restriction or prohibition of such trade.

In addition to the above provisions, the Conference of the Parties (COP) has also passed resolutions in relation to trade in Appendix II species. COP2 adopted Resolution Conf. 2.6 on trade in Appendix II and III species. Based on this Resolution, any Party may consult directly with the Management Authority of a country involved, or with the Secretariat, if it deems that any Appendix II species is traded in a manner detrimental to the survival of that species.

Concerned with the unsustainable use of wildlife, COP6 set up an Animals Committee to review trade in wild species listed on Appendix II. Such a review process was formally established in Resolution Conf. 8.9 adopted at COP8.

Challenges to producers

CITES lists some 2,500 animals and 35,000 plants in the three Appendices. Owing to various factors such as climatic conditions and underdevelopment, most of these species are within the jurisdiction of producer countries where megabiodiversity is found. Indonesia and Madagascar are among such countries teeming with numerous plants and animals found nowhere else in the world. Since the loss of these species means their disappearance from the Earth forever, most exotic species subject to trade are afforded Appendix II protection where non-detriment findings are required for their export.

The significance of trade in these exotic species as an economic generator can be no better felt than by those people living in these countries. However, driven by the short-term economic benefits of consumptive use of wildlife, some producer countries have failed to take into account the long-term ecological value of these species. For those that do make such findings, general lack of funding and well-trained personnel pose great challenges to research institutions and universities of these countries in undertaking the surveys and monitoring programs which provide key information for making of non-detriment findings.

The establishment of Significant Trade Review Process for Appendix II species is a manifestation of such concerns by CITES. Upon completion of the three phases of review, recommendations were made for over 100 taxa involving about 50 countries. Imports of more than 30 species from nearly 10 countries were suspended because fulfillment of requirements by those Parties was deemed unsatisfactory. For fear of trade suspension with affected species, some countries simply prohibited their export voluntarily.

Attitude of consumers

The impact of demand on endangered species conservation by producer countries can easily be seen. CITES failed to protect Appendix I listed sea turtles because the voracious market simply overwhelmed the ability of producer countries to regulate trade. Similarly, China’s use of rhino horn and tiger bone attributable to the demise of these species has been much publicized by the CITES community.

The catastrophic killing of 20,000 Appendix I listed Tibetan antelopes each year, to satisfy the fashion of the affluent few, was conceived to be the result of uncontrolled poaching in the producer countries (in spite of the human lives lost in the confronting battles with poachers under extreme climatic conditions on the highest plateau in the world). However, there appears to be a unwillingness for some consumer countries to acknowledge their role in the course of this trade. From the attitude shown Appendix I species, it is hard to imagine a change to Appendix II species. As a matter of fact, it has been long taken for granted that consumer countries are taking the lead in species conservation and, that someone else is to blame for unsustainable trade.

Whatever the likelihood for China to write off tiger bone and rhino horn from...
CITES, Continued

its pharmacopoeia thereby terminating the half-millennium-long use in traditional Chinese medicine, a basic rationale stands that without acknowledgement of adverse impact from demand in consumer countries, the principle of sustainable use, even conservation, of endangered species can hardly be achieved.

It seems also to be the attitude of some consumer countries that those who benefit from wildlife trade should bear the responsibility of preventing these species from extinction.

Before the African elephant was listed on Appendix I in 1989, Japan consumed as much as 40% of ivory originating in Africa. If Japan had cooperated with and assisted producer countries in checking over-exploitation in accordance with the recommendations of Resolution Conf. 2.6, the populations of the African elephant would not have dropped by 50% from 1.3 million in 1979 to 600,000-800,000 in 1986. Likewise, suspension of trade in a large number of species as a result of significant trade review suggests that consumer countries failed to implement the recommendations of Resolution Conf. 2.6, which would otherwise have prevented their over-exploitation, or consumer countries adhered to a belief that producer countries should bear this responsibility.

In addition, trade regulation in Appendix II species is further compromised by relative lax enforcement in major consumer countries.

CITES implementation in the European Union (EU) has been “disheartening” in the past several decades. A study by the World Wildlife Federation (WWF) outlines that the EU is a huge market for illegal trade in wildlife, causing substantial pressure on many species, including endangered primates, wild cats, parrots, alligators, crocodiles, snakes and plants. Bombarded by numerous wildlife consignments in major ports of entry on a daily basis, the Endangered Species Act of the United States simply does not help to eradicate the high illegal trade in that country.

A close-up of CITES framework

Major mechanisms of CITES to ensure the sustainability of trade in Appendix II species are to some extent more biased than impartial.

The Significant Trade Review Process with respect to Appendix II species, appears to be a one-litigant trial in court. Under this process, the Animals Committee determines whether a trade level is safe by interrogating the producer countries.

What can be observed from the case of the African elephant is that export records from producer or range States (sometimes over a dozen, as in the case of the African Elephant) only provide a horizontal view of this trade. Import records kept by consumer countries in most cases can be very useful in evaluating the impact of trade on a species. Meanwhile, review of import records can also expose those Parties who fail to implement the recommendations of Resolution Conf. 2.6. In this sense, the existing process serves leaves alone those consumer countries with unsustainable imports on one hand, and renders those producer countries scapegoats for unsustainable trade on the other.

The right to adopt stricter domestic measures provided by Article XIV.1 is also a matter of controversy. Stemming from this privilege is such a tension point: under what circumstances can it be exercised against a range State when the species concerned occurs in more than one range State? Article IV.2.(a) allows issuance of an export permit if a Scientific Authority is satisfied that such export will not be detrimental to the survival of that “species,” rather than “populations within its territory.” It is therefore unscrupulous for a country to impose trade restrictions or prohibitions without first making non-detriment findings on the basis of necessary information about that species in its whole range rather than populations of any single range State.

Apparently, the tension point lies in the fact that it is a right rather than an obligation. That a right can be exercised at will necessitates imposition of limitations. Without clarifications to this effect, this right achieves little but to arm consumer countries with a stick to brandish carefree.

National sovereignty

There is a strong protest among a number of producer countries towards the use of stricter domestic measures as a conservation tool since these are construed to provoke a challenge to national sovereignty in the use of natural resources within a country’s jurisdiction.

Acknowledgement of national sovereignty in the use of natural resources within a nation’s jurisdiction is a well-established principle of international environmental law. It was first recognized in the United Nations Charter and subsequently cited by the Stockholm Declaration of the UN Conference on the Human Environment and Rio Declaration on Environment and Development and other international instruments. The Preamble of CITES recognizes that “peoples and States are and should be the best protectors of their own wild fauna and flora.”

Nevertheless, countries can not build their economic development upon activities that invariably cause environmental degradation and depletion of natural resources. There exists a responsibility in these producer countries to hand over these natural resources to the generations to come. In the framework of CITES, this responsibility is enshrined in the principle of sustainable use encapsulated in the non-detriment findings clause. Accordingly, this responsibility should not give way to sovereignty, as least for the sake of intergenerational equity.

Future prospects

In the book “The Sinking Ark,” Myers proposed a dual responsibility towards species existing within national jurisdiction: “First, any nation faces a duty to safeguard the species within its territory… Second, all humankind faces a duty to offer whatever support if required to enable individual nations to discharge their duties.”

In the years ahead, it is upon the acknowledgement of this responsibility, and subsequent goodwill actions by major consumer countries, that the future of endangered species depends.

About the Author. Mr. Guo Yinfeng is a visiting scholar at Pace University School of Law. He works with CITES Scientific Authority in Institute of Zoology of Chinese Academy of Sciences in China.
February 2, 2000

The Honorable George Pataki
Executive Chamber
State Capitol
Albany, New York 12224

RE: Proposed Sale of Nuclear Power Plants in New York

Dear Governor Pataki:

The undersigned organizations commend you on your commitment to link energy with environmental and public health issues, particularly with respect to air quality and reducing pollution from fossil-fueled power plants and vehicles.

Today, we are writing to draw your attention to several key policy issues related to the proposed sale of nuclear power plants in New York. These issues include: (1) the public process used for the divestiture of nuclear power plants by their current owners (2) plans for the decommissioning of nuclear power plants, and (3) the operation of nuclear plants under competitive market conditions.

Our concerns, which are elaborated below, lead us to the following recommendations:

1) That the sale of nuclear power plants, be they investor-owned or publicly-owned, should be conducted in a transparent manner guided by publicly disclosed criteria that have been developed in a deliberative process by a publicly accountable entity.

2) That any sale of nuclear power plants should not be coupled to the guaranteed recovery of the remaining stranded costs associated with those facilities. Instead, the Public Service Commission should open up a separate proceeding on nuclear stranded costs with the objective of mitigating those costs so as not to distort emerging electricity markets.

3) That any prospective owner of a nuclear power plant be required to fully disclose their plans for plant decommissioning prior to any sale and that periodic reports on those plans and any changes be made to a publicly accountable New York entity.

4) That any funds collected in the decommissioning account that are in excess of the requirements for decommissioning be held in an escrow account for a reasonable period of time to be used if further remediation of reactor sites is required in the future. Ultimate disposition of any surplus funds should be the responsibility of a publicly accountable New York entity.

5) That you appoint a balanced panel of citizens (including Native American, public interest and environmental groups and representatives from the affected communities) that will periodically review the operation, maintenance and structural integrity of the nuclear plants operated under competitive market conditions and issue periodic reports as a way of ensuring that electric deregulation does not adversely affect the safe operation of the reactors.

These issues have long-term consequences for the economic well-being of several New York communities, the public health of current and future generations of New Yorkers and the quality of sensitive environmental resources. We are convinced that these issues require immediate policy guidance at the highest levels of state government and should not be dealt with in a piecemeal fashion by the various state bureaucracies responsible for energy, land use, economic development and environmental quality.

(1) Process for considering nuclear plant divestiture

The New York Public Service Commission (PSC) deserves to be commended for recognizing that the integration of nuclear power into competitive electricity markets

Nuclear Letter, continues
Nuclear Letter, continued

List of Signatory Organizations:
Association for Energy Affordability, Inc.
Biofuels America!
Cancer Awareness Coalition
Catskill Alliance for Peace
Catskill Center for Conservation and Development
Chenango North Energy Awareness Group
Citizen Action of New York
Citizens Advisory Panel (CAP)
Citizens Protecting Ohio
Coalition Against Millstone
Citizens United for a Responsible Environment
Energy Plus Cooperative of the Southern Tier and Finger Lakes Environmental Advocates
Global Resource Action Center for the Environment
The Health & Energy Institute
Hudson River Sloop Clearwater, Inc.
Hudson Valley Sustainable Communities
Network
Indian Point Project
Kids Against Pollution
Long Island Progressive Coalition
Metro Justice
Natural Resources Defense Council
New York Greens
New York Public Interest Research Group
No Escape
North Fork Environmental Council
Nuclear Free New York
Nuclear Information and Resource Service
Orange Environment, Inc.
Pace Energy Project
PROTECT
Radiation and Public Health Project
Ramapo River Committee
Renewable Energy Works!
Safe Legacy
Sierra Club, Atlantic Chapter
Social Action Committee of Temple Beth El
Sound & Hudson against Atomic Development (SHAD Alliance)
Standing for Truth About Radiation

raises issues that warrant special attention. In late 1998, the PSC launched a collaborative proceeding (Case 98-E-0405) to discuss how New York’s four investor-owned nuclear reactors (Nine Mile Point Unit One, Nine Mile Point Unit Two, R.E. Ginna, and Indian Point Unit Two) should be treated in the restructured electricity market. [A primary purpose of this proceeding is to reach a decision on how to implement a PSC staff recommendation that the nuclear plants also be subject to the competitive electric marketplace.]

However, before this collaborative proceeding concluded and before the PSC could set policy on this important matter, the Niagara Mohawk Power Corporation (NiMo) and the New York State Electric & Gas (NYSEG) announced that they had reached a deal to sell their ownership in the Nine Mile Point One (NMP1) and Two (NMP2) nuclear reactors to AmerGen Energy Company LLC, a joint venture between PECO and British Energy. In late August of 1999 - soon after NiMo and NYSEG had made their announcement - the PSC opened up a Section 70 (Case 99-E-0933) proceeding to review the proposed sale of NMP1 and NMP2. In a letter dated January 26, 2000, Mr. Kevin Lang, counsel to the Staff of the Department of Public Service (“DPS”), advised that the DPS Staff will ask the Commission to dismiss the PSL § 70 petition filed by Niagara Mohawk, NYSEG and AmerGen, on the grounds that the sale of the Nine Mile nuclear plants on the terms proposed would not be in the public interest. The case will soon enter the litigation stage.

Complicating matters is the fact that it is still not clear whether Rochester Gas and Electric (RG&E) - which has exercised its “right-of-first-refusal” and matched AmerGen's original offer to buy all of the NMP1 plant and a controlling interest in NMP2 - will continue to pursue the purchase or be allowed to do so. RG&E plans to bring in Entergy Nuclear Inc., a subsidiary of the Entergy Corporation based in Louisiana, to lease, operate, and maintain the reactors.

The fact that RG&E has indicated its willingness to match the AmerGen bid for the power plants strongly suggests that the ratepayers’ interests have not been fully captured in the private negotiated arrangement between Niagara Mohawk and AmerGen. A more deliberative and understandable process would have been for the Public Service Commission to have supervised a competitive bidding process using publicly disclosed criteria for the divestiture of these assets.

Indeed, such a process has been used by utilities for the divestiture of their fossil fuel power plants. Clearly, a transparent and competitive process would be fair to all participants and assure that ratepayer interests were appropriately considered.

(2) Impact on emerging electricity markets
As noted above it is virtually certain that the value of the nuclear power plants would be greater if subjected to a competitive process than was obtained through the private negotiations between Niagara Mohawk and AmerGen. Still, we do not expect that the current owners of the power plants will be able to recover through divestiture anything near to the amount they invested in those plants. In fact, the AmerGen offer, $163 million for full ownership of NMP1 and for a 59% share of NMP2, is well below the current book value (1997) of these plants, $354 million and $2,837 million respectively. This offer would recover only seven cents per dollar of book value of these plants.

How responsibility for the remaining sunk costs of these plants is allocated can have a significant impact on emerging electricity markets. The issue is of such magnitude that the Public Service Commission needs to open a separate proceeding in which information on market impacts – for all classes of customers: industrial, commercial, small business and residential – of alternative stranded cost policies can be considered.

(3) Decommissioning Method and Timeframe
There are several public policy concerns related to decisions about the decommission-
Pace Environmental Litigation Clinic  

Case Docket

**Case: Hudson Riverkeeper Fund, Inc. v. Orange and Rockland Utilities, 93 Civ. 3116 (CLB) (S.D.N.Y.).**  
Background: Orange and Rockland operates the Lovett power plant on the Hudson River across from Indian Point.  
The plant draws in millions of gallons of cooling water intake from the river, killing tens of thousands of fish each year. Under O&R’s permit from the Department of Environmental Conservation, the plant is required to use the “best available technology” to mitigate environmental damage. We allege that O&R has failed to do so and filed a complaint to force the utility to live up to its permit. In June 1995, O&R began experimenting with a “permeable curtain” designed to allow water to flow through it but to prevent fish from reaching the cooling water intakes. O&R conducted a second, larger experiment in August 1996.  
**Status:** Riverkeeper agreed to withdraw its lawsuit in exchange for O&R’s commitment to explore fish-saving technologies. Riverkeeper reserves the right to bring another lawsuit if necessary.

**Case: New York State Department of Transportation.**  
Background: New York State DOT has proposed to widen Route 120 between Westchester County Airport and Route 22 in Armonk, right on the banks of the Kensico Reservoir. Despite the close proximity of this road widening to the public drinking water supply, no site-specific stormwater pollution control program was considered in the Environmental Impact Statement for the road project. In addition, the road widening will increase development in the Route 120 corridor, contrary to the policy of protecting the watershed from further development.  
**Status:** Pace Environmental Litigation Clinic students appeared at hearings on the Environmental Impact Statement, and filed comments pointing out the inadequacies of the environmental studies. As a result of these comments, New York State DOT has announced plans to perform a more detailed stormwater analysis before proceeding with the project.

**Case: Concerned Residents of Kent, Inc. v. Town of Kent, Index No. 1766/98 (Sup. Ct. Putnam County).**  
Background: FAC Realty Trust, a real estate development company, has proposed to construct a factory outlet mall in a rural area in close proximity to New York City reservoir property. Construction of this mall requires the transfer of property now owned by the Town of Kent and used for its highway garage. Pursuant to the Town Law, such property can be transferred only after a permissive referendum, and such a transfer requires completion of environmental impact review under the State Environmental Quality Review Act. Nevertheless, the Town Board adopted a resolution authorizing sale of the Town property without conducting any environmental review, and failed to hold a referendum within the time period required by Town Law § 91. The Town held a referendum on the proposed sale at the November, 1998 general election, after the time required for a permissive referendum had expired. The referendum passed. Because the timing of the referendum violated the Town Law, and because the Board failed to complete the required environmental review, the Clinic commenced an Article 78 proceeding on behalf of Concerned Citizens of Kent and the Croton Watershed Clean Water Coalition. Justice Sweeney of the Putnam County Supreme Court dismissed the Article 78 petition.  
**Status:** In August, 1999, the FAC Realty Trust and the Town of Kent announced that the project was being abandoned. Nevertheless, since the Town refused to give any assurance that the project would not be resurrected, the Clinic perfected its appeal to the Appellate Division, Second Department in October, 1999. The respondents have moved to dismiss the appeal on the grounds of mootness.

**Case: Riverkeeper, Inc. v. Central Hudson Gas & Electric, 99 Civ. 2536 BDP (S.D.N.Y.).**  
Background: The short-nose sturgeon is an endangered species fish that inhabits and spawns in the Hudson River. Every year, quantities of short-nose sturgeon are injured or killed when they are caught in cooling water intake structures at power plants on the Hudson River. None of these utilities has obtained the permit required under the Endangered Species Act for such “incidental” takings. In the spring of 1998, the Clinic filed a notice of intent to sue under the Endangered Species Act. This prompted the utilities to file a preliminary application for an incidental take permit with the National Marines Fisheries Service.  
**Status:** In April 1999, after nearly a year of inaction by the utilities, the Clinic filed suit in federal district court against Central Hudson under the Endangered Species Act to enjoin its continued taking of short-nose sturgeon without a permit. During the summer and fall of 1999, the Clinic interns conducted document dis-
Docket, Continued

covery, a site visit, and depositions of Central Hudson personnel. On November 15, 1999, the Clinic served a motion for summary judgment declaring Central Hudson to be in violation of the Endangered Species Act.


Background: In December, 1998, the New York State Board on the Siting of Electric Generating Facilities adopted regulations governing the issuance of water pollution discharge permits by new electric generating facilities. The Board failed to prepare an environmental impact statement under the State Environmental Quality Review Act for these substantive regulations, relying instead on a "type II" designation that applies only to procedural regulations. Riverkeeper filed a proceeding pursuant to CPLR Article 78 challenging the adoption of these regulations without an environmental impact statement.

Status: The Clinic assisted Riverkeeper in preparing the petition and memorandum in this proceeding. No decision has been rendered yet.


Background: New York City DEP has responsibility to regulate permitting for new septic systems within the New York City water supply watershed. Under the Watershed Agreement, New York City was required to apply the most stringent rules applicable under New York State Department of Health regulations. These regulations prohibit the construction of septic systems on natural slopes exceeding 15%. This rule is necessary to prevent septic system failure and contamination of surface waters with sewage. In October, 1998, New York City DEP adopted a new policy allowing developers within the watershed to avoid this ban on steep slope septic construction by artificially modifying steep slopes with imported soils. This policy was adopted without any public review or comment, and without any environmental review.

Status: Pace Environmental Litigation Clinic filed an Article 78 proceeding on behalf of Riverkeeper and other watershed organizations in October, 1998. The Court denied New York City DEP’s motion to join the New York State Department of Health as an indispensable party, and the matter was fully submitted with the filing of the Clinic’s reply papers on November 30, 1999.

Case: Millenium Pipeline.

Background: Millenium Pipeline, sponsored by the Columbia Gas Company, has proposed to construct a natural gas pipeline across New York State, terminating in Westchester County. The proposed pipeline would cross Haverstraw Bay on the Hudson River.

Status: Riverkeeper has been granted active party status in the licensing proceeding before the Federal Energy Regulatory Commission. Riverkeeper will seek to ensure that, if built, the Hudson River crossing avoids impacts on the Hudson River and dangers to navigation.

Case: Shandaken Tunnel Turbidity.

Background: The Shandaken tunnel carries water from the Schoharie Reservoir to the Esopus Creek in the Catskills, which then flows into the Ashoken Reservoir. New York City DEP operates this tunnel as part of its water supply system. Esopus Creek is a renowned trout fishing stream. Unfortunately, the water that is piped in from Schoharie Creek is of much lower quality than the natural flow in the Esopus, and contains high amounts of suspended solids, clouding the clear waters of the Esopus, and ruining the Esopus for trout fishing. DEP has no Clean Water Act permit for this discharge of contaminated water into the Esopus Creek.

Status: Pace Environmental Litigation Clinic has filed a notice of intent to sue DEP on behalf of Riverkeeper and several other Catskill sportmen’s organizations. The suit will seek to require DEP to obtain a federal Clean Water Act permit for the Shandaken discharge, which will require DEP to adopt the best available technology for reducing the suspended solids content of the Schoharie water discharged into the Esopus. During February, 1999, Clinic lawyers and interns have held a series of meetings with New York City DEP, New York State DEC, and the Attorney General’s office to determine if a negotiated resolution was possible.


Background: Under the federal Clean Water Act, sources of stormwater runoff associated with industrial activities must obtain coverage under a general permit issued by a state, and comply with best management practices requirements for stormwater pollution control. Automobile junkyards are covered by this requirement. Natural Resources Defense Council investigated compliance with this requirement by junkyards located in the Long Island Sound coastal area and discovered several junkyards operating in violation of the Clean Water Act permitting requirement.

Status: The Clinic has commenced federal citizens suits to enforce the Clean Water Act requirements against two of these junkyards on behalf of NRDC and Long Island Soundkeeper Fund, Inc. A default has been entered in the case against Michael Soda, while the Clinic decided to file a voluntary dismissal in the case against LeBlanc because plaintiffs lacked evidence to prosecute that case. The Clinic recently filed an application for a default judgment in the case against Soda.

Case: United States Coast Guard.

Background: From 1950 to 1973 (and possibly later), the United States Coast Guard regularly and systematically disposed batteries from all Aids to Navigation (AtoNs) in waters of the United States by discarding them into the surrounding water. In the early 1990s, the Coast Guard initiated a nation-wide cleanup effort that categorically excluded all floating AtoNs and prioritized the cleanup effort on fixed Aids, so that batteries at low priority AtoN sites stand little, if any, chance of being recovered. These "low priority" sites include salt water sites.

Status: The Pace Environmental Litigation Clinic filed a letter of intent to sue on August 28, 1998 on behalf of Riverkeeper and
13 other Keeper Groups around the country. The Pace Clinic, with the cooperation of Riverkeeper and the other Keeper organizations, is in the process of investigating AtoN sites and collecting further evidence in preparation of litigation.

**Case: Biotech Mills Permit Application.**
**Background:** Biotech Mills has filed an application to reactivate a paper mill and discharge wastewater into the Battenkill Creek, a fabled trout stream. The applicant has a history of permit violations under a previous permit.

**Status:** Pace Environmental Litigation Clinic is representing the Battenkill Conservancy before the New York State Department of Environmental Conservation in opposition to the permit application.

**Background:** Two abandoned industrial sites, the former Anaconda Copper wire manufacturing site and the former Tappan Terminal, in Hastings, New York, contain hazardous waste that is seeping into the Hudson River. In addition, one of the buildings on the site has been used as an illegal construction and demolition debris dump. The clinic initiated an action under RCRA and the Clean Water Act against ARCO, the corporate successor to Anaconda Copper, as well as others who share liability for the sites. The clinic is currently engaged in settlement discussions with most of the parties regarding a clean up of a site that contains one of the only deep water ports on the Hudson River north of New York City.

**Status:** Thanks to the Clinic’s efforts, the parties reached a settlement requiring the prompt removal of the accumulated construction and demolition debris by the site owner. Meanwhile, the Clinic continues to press for a full clean-up of the toxic contamination remaining from the Anaconda operation and Tappan Terminal. In October, 1999, Judge William C. Conner of the Southern District of New York granted the Clinic’s request to reactivate its RCRA case and for leave to file a motion for summary judgment declaring ARCO’s liability for cleanup of the site; these motion papers were served on December 1, 1999.

**Case: Town of Dover.**
**Background:** The Clinic has been assisting the Town of Dover in addressing zoning and land use issues raised by proposals for several construction and demolition debris landfills and other solid waste facilities proposed within its borders. A large portion of Dover sits atop a highly productive groundwater aquifer. Nonetheless, DEC has refused to give the aquifer protection as a primary or principal aquifer. As the nearest community to the metropolitan area that lies outside the New York City watershed, Dover has experienced intense pressure by industrial operations now excluded from the watershed.

**Status:** The Clinic, in conjunction with the Pace Land Use Center, has been providing advice. The Clinic successfully defended the Town of Dover in litigation challenging a moratorium on solid waste uses adopted by the Town in March, 1998. This litigation was captioned T&E Development, Inc. v. Town of Dover, Dutchess Co. Index No. 2215/98. The final rezoning was adopted in April, 1999. In September, the Town of Dover was sued by the operator of a soil mine who is seeking DEC permits to construct a construction and demolition debris landfill at the site of its mine. The Clinic is defending the Town of Dover in the Article 78 Proceeding, which is captioned Danny Fortune Company, Inc. v. Town of Dover, Dutchess County Index No. 99/4052. The Clinic filed a motion to dismiss on statute of limitations grounds and is awaiting a decision.

**About the Author.** Ed Smeloff is the Executive Director of the Pace Energy Project. For more information on the sale of Indian Point 2, see page 15.
and destructive levels dispersed over the land surface and on the bottom of the sea located in the EMA and in the “Inner Range AFWTF” with potentially high levels of environmental pollution, as found by several studies conducted by the Puerto Rico Environmental Quality Board (EQB).

7. Contrary to the Commonwealth’s official policy, which demanded the “immediate cease and desist of all military maneuvers in Vieques,” the Directive perpetuates several Navy installations in the western portion of the island, as well as amphibious operations and a shooting range in the eastern portion.

8. The “agreement” simply constitutes a mechanism to pay the people of Vieques $90 million dollars in exchange for their consent to the indefinite presence of the Navy with live fire practice. It equals to roughly $9,000 per person. The money will not come from the Navy nor from DOD, but from an initiative of the OMB, which requires congressional approval. Moreover, it is known that the Navy not only uses Vieques as maneuver and training area, but leases its facilities to countries belonging to the North Atlantic Treaty Organization (“NATO”) and to third countries. For this lease, it receives in exchange double the amount that the Federal Government would give to the Vieques people under the Directive.

9. The “agreement” does not provide economic compensation for the persons who have been affected as a result of the Navy activities during the past decades, mainly fishermen.

10. The “agreement” — actually, the letter from the Governor to President Clinton — releases the Navy from any duty or obligation to conduct any epidemiological study to investigate the causes of serious health problems of the island residents, including the high cancer rates which the Vieques population suffers. It also fails to commit the Navy to assume the cost of the needed epidemiological study in Vieques. It also does not contain any commitment from the Navy to effectuate nor to assume the cost of the remedial measures which the study might suggest, nor does it establish the time when it starts and ends. It only specifies that the “US Department of Health and Human Services” will carry out the study.

11. The referendum will be designed in a way to perpetuate the presence of the Navy indefinitely. This is a very serious flaw in the process. The Navy will have the power to set the date of the referendum which will call for its eventual pull out, but the Navy has indicated that it has no intention whatsoever to leave the Vieques maneuver area. According to Secretary of Defense William Cohen’s statements, the referendum “should not be construed in way that it is wasted and delivers a conclusion against the Navy’s best interests. The proposed offer, in terms of the transfer of funds and of the lands in the western quarter, has been designed not to provide an incentive to reject what the Navy needs to do, but in order to change the position of the Vieques people and of the Puerto Rican government.”2 Given its previous record in Vieques, leaving the Navy the power to decide when the referendum will take place represents a serious conflict of interest, and brings into question this exercise of self-determination.

12. The “agreement” is implemented, as we have mentioned, through a Presidential Directive. Under this premise, nothing will impede that in the future, another President, or President Clinton himself before he concludes his mandate, could unilaterally suspend or revoke or in any other way leave without effect the Directive.

13. The decision of the Government of Puerto Rico to renounce any judicial action will give away any opportunity to reach a Consent Agreement by which any agreement would be enforceable, at the very least, by the courts. This self-restriction also closes the door to initiate or continue in the courts, proceedings in the case of noncompliance by the Navy of the Memorandum of Understanding signed in 1983.

14. The “agreement” does release the Navy from any liability caused by the environmental pollution due to the intensive use of explosives in the Inner Range AFWTF. This is crucial, since the EQB has found the presence of explosive components such as RDX and Tetryl in the drinking water reservoirs in Vieques. Sampling conducted by the EQB show concentration levels of RDX, Tetryl, TNT, toluene and cyanide compounds in both the civil and shooting range areas were similar.3 Moreover, further studies have found that the toxics leaking out of the bombs at the bottom of the sea are affecting corals and other marine life. In particular, the damage done to the corals may be irreversible, since many of the formations are dying, if not already dead. EQB has found thousands of 55-gallon containers filled with unknown chemical substances inside two sunken ships along the coast within the Inner Range AFWTF, which could represent a potential risk of pollution to the entire southern coast of Vieques if they leak or rupture during the maneuvers.

15. The “agreement” does not specify whether studies will be conducted to determine the level of the highly toxic substance, depleted uranium (“DU”), which the Navy acknowledged to have released on Vieques, on at least one occasion in 1999.4

16. The “agreement” was negotiated without the prior knowledge of the Vieques Commission which Gov. Rosselló himself named to work on a solution to the impasse between the Commonwealth and the Navy. In fact, the letter of acceptance was already written and sent to President Clinton, when the Governor decided to set a meeting with the Vieques Commissioners to discuss the terms of the agreement. There were no con-
Energy Efficiency, Continued from Page 12

society, including reductions of carbon dioxide and other health-damaging pollutants.¹¹

Lighting

In countries that have grid electricity, replacement of incandescent light bulbs with compact fluorescent bulbs which last four times longer and use one-quarter as much electricity achieves great savings to the consumer and to society. Task lighting, reflectors and use of daylight also result in significant savings at low or no cost. In many countries, utilities invest in lighting efficiency measures for residential and business customers, sometimes repaying out of the savings from the conversion. Many countries have started to produce the compact bulbs for domestic use and for export, creating important business, revenue and job creation opportunities. Conversion of incandescent street lighting to sodium vapor or other efficient alternatives again creates considerable savings to municipal taxpayers and to the environment, and produces much improved lighting to boot.¹²

In the rural areas of most developing countries, which lack grid electricity, night lighting is provided at high costs and with severe pollution consequences by kerosene. One consequence is that about one-third of the world population uses fuel-based lighting with very significant greenhouse gas emissions and cost consequences. One study found that kerosene accounted for nearly 60% of the total energy requirement for lighting in India’s residential sector in 1986 and 40% as much energy as that required to produce the electricity used for lighting in Brazil.¹³

Fuel-based lighting creates substantial amounts of carbon dioxide emissions. The results of a recent study show that between 15 and 88 billion liters of kerosene are consumed each year to provide residential fuel-based lighting in the developing countries. The cost of this energy ranges from $15 to $88 billion per year. This fuel-based lighting results in between 37 and 223 million metric tons of carbon dioxide emission per year. The energy services provided are 1/80th of the level of electric light sources and the lumens of light provided are approximately 1/1000th that enjoyed in households in the industrialized world.¹⁴

Insulation

Most of the buildings in the developing countries are totally without insulation, resulting in the waste of much of the fuel (usually fossil) which is used to heat and cool them. Many of the older buildings in developed countries also lack adequate insulation. The buildings can be retrofitted with insulation at a payback of just a year or two of the retrofit costs.

A single tree can evaporate 40 gallons of water a day, offsetting the heat equivalent to that produced by 100 100-watt lamps burning eight hours per day.

Urban Heat Islands

One-sixth of the electricity consumed in the U.S. goes to cool buildings, at an annual cost of $40 billion. In urban areas, the lack of shade for buildings, dark-colored roofs and roads create what is known as urban heat islands which consume large amounts of air conditioning energy. The planting of deciduous trees on the south side of buildings and painting the buildings in light colors, routinely done in many tropical countries, are low cost/no cost means of achieving substantial savings in the energy used for air conditioning in hot climates. Thus, building owners in Haifa and Tel Aviv are required to whitewash their roofs each spring.¹⁵

The use of light colored aggregates in highway and road construction materials can also achieve substantial energy savings. The direct savings in air conditioning of the buildings treated are supplemented by an indirect saving from the lowering of temperature in surrounding buildings.¹⁶

A program promoting urban heat island improvements would achieve multiple carbon dioxide savings from the absorption of carbon dioxide from the trees and from the reduced use of energy for air conditioning. It is estimated that a tree in Los Angeles will save 3kg of carbon per year by lowering citywide air conditioning requirements plus 15kg per year in building air conditioning savings if planted to shade a building.¹⁷ An urban tree reduces carbon dioxide emissions about 9-times more than a tree in the forest because of the air conditioning it will save in urban areas.¹⁸ A single tree can evaporate 40 gallons of water a day, offsetting the heat equivalent to that produced by 100 100-watt lamps burning eight hours per day.¹⁹

Cooking Stoves

Much of the cooking in developing countries is done on wood or coal burning stoves, exposing occupants to very concentrated emissions and contributing considerably to carbon dioxide and other pollutant emissions. Inexpensive efficient stoves are available and in use in many places around the world now which both reduce the amount of fuel needed and pollutant emissions.

For example, Kenya has an outstanding cooking stove program, having adapted a Thai bucket ceramic-lined charcoal-burning stove that saves between 20% and 50% of the fuel otherwise used and now costs only $1-3. There are now about 900,000 of these Ajiko stoves in Kenya, reaching about 60% of urban households and 20% of rural homes. About 200 local firms produce the stoves. The Kenya program has been adopted in Tanzania, Uganda and Rwanda. China established a National Improved Stove Program in 1992, which has provided over half of China’s rural households with improved stoves. China also started to manufacture, install and service the stoves. Some 160 million cooking stoves were upgraded between 1982 and 1998 at a cost of $158 million in government support. The unit cost per
Drinking Water Purification

The recent development of ultraviolet (UV) water purification, if widely adopted, could save the vastly greater energy consumed by existing water filtration and chlorination plants in industrialized societies or the use of fossil fuel or wood to boil water for purification in developing countries. Attendant advantages are that UV processes use no chemicals, impart no taste or odor to water, have no risks of overdose, do not require pressurized water and cost less than the alternatives.

Approximately 1 billion people worldwide use cook-stoves to boil their drinking water. This process is reliable, but it demands labor, imposes high economic, environmental and human health costs and is ultimately susceptible to limited fuel availability. It contributes to carbon dioxide emissions both through the combustion of the biomass and the destruction of forests needed to furnish the fuel wood.

UV treatment uses approximately 6,000 times less energy than boiling over a biomass cook stove. UV technology is a rapid disinfecting process that acts at the DNA level without heating the water, and thus offers great energy and cost savings potential. It has been estimated that if half the 500 million people in China who use biomass stoves for water purification were to use UV treatment instead, 125 metric tons of carbon dioxide emissions a year would be saved with a potential cost of $0.26 per ton of carbon saved at approximately half the cost of the wood stove technology, not counting environmental externality costs savings.

Recycling

The recycling of household waste products economically saves consumers and municipal taxpayers the costs and pollution of waste incineration. The recycled waste is often convertible into useful products that can create revenues and jobs.

In the industrial and commercial sectors, the recycling of wastes is also economically and environmentally advantageous. For example, the U.S. throws away enough aluminum to rebuild the country’s commercial aircraft fleet every three months, even though recycling aluminum takes 95% less energy than manufacturing it. Interface, the world’s largest carpet-tile maker, estimates it cuts its materials flow by about tenfold by leasing floor-covering services instead of selling carpet and by remanufacturing old carpet. Land and coal mine gas recovery turns heat-trapping and hazardous methane emissions into a valuable fuel that also displaces fossil fueled power plants.

Transmission & Power Plant Efficiency

In many developing countries, the transmission and distribution systems are inadequate, causing large losses of the power generated and also resulting in frequent blackouts or brownouts that are very costly to businesses. Even in developed countries, these systems are often neglected, resulting in outages at times of system stress — as with the blackout in New York City in a heat wave last summer. Leaky transmission systems cause unnecessary and costly pollution emissions. Upgrading inadequate transmission or distribution systems should be a high priority in these cases. Usually, these costs are borne by the utility company and paid for in the electricity charges, but legislation and financing assistance may be necessary to effectuate these efficiencies in some developing countries.

Distributed resources such as energy efficiency measures, fuel cells and photovoltaics are often economic alternatives to expansion or upgrades of transmission and distribution systems. Because of their proximity to customer loads, distributed systems can offer improved reliability, as well as carbon dioxide emission reductions, particularly efficient compared with the typical transmission losses of about 10% of central plant generated power.

Most power plants in the U.S. and around the world also are grievously inefficient, converting most of their fuel into waste heat rather than power production. While the U.S. average power plant efficiency has increased from about 23% in 1949 to 32% in 1996 due to the introduction of 52% efficient combined cycle natural gas power plants, if all plants were that efficient, power sector carbon dioxide emissions in 2010 would decline about 30%, cutting U.S. carbon emissions by about 190 MMT. If this generation all came from natural gas plants, carbon emissions would decline by a further 32% (215 MMT).

Industrial Efficiency

Electric motors consume more than half of the electricity in the U.S. and almost 70% of manufacturing sector electricity. Replacement of standard electric motors with smaller variable speed drive motors (as with the gear shift in a vehicle) and matching the motor output to the load, produces large electricity and pollution savings and economic benefits. It has been estimated that variable speed electric motors would result in short-term carbon emission reductions of nearly 10 million tons per year in the U.S., nearly 8 million tons in Japan and over 14 million tons in the European Community. Technological improvements also have permitted manufacture of much more efficient motors.

Industry can also benefit itself and reduce carbon emissions by relamping, replacing their incandescent lights with compact fluorescents, reflectors and task lighting.

The biggest industrial energy savings, though, frequently occur in improving the efficiency of industrial processes themselves, e.g. using continuous casting of steel and utilizing waste products for electricity and heat generation, as is often done in paper, lumber and plywood manufacturing in the United States. The U.S. chemical industry saved nearly half its energy per unit of product from 1973-1990 by plugging steam leaks, installing insulation and recovering lost heat. These kinds of improvements can usually be financed through commercial loans repayable from the savings achieved. Some U.S. utilities do industrial efficiency audits, provide technical assistance and participate in the financing.
of efficiency improvements.

The industrial sector in the U.S. accounted for about 36 quads of primary energy use in 1997, 39% of U.S. energy consumption, with manufacturing in six sectors dominating (petroleum refining, chemicals, primary metals, paper and pulp products, food products, and stone, clay and glass products). There is a great potential for cost-effective improvement. For example, an in-depth analysis of 49 specific energy efficiency technologies for the iron and steel industry in 1999 found a total cost-effective energy savings potential of 18%.

Combined Heat and Power (Cogeneration)

Utilization of the waste heat from electricity generation for industrial or district heating purposes converts as much as 90% of fuel input into useful energy, compared to 30-35% for a conventional power plant, thus saving significant amounts of fuel and pollution. Conversely, some manufacturing facilities that produce substantial high temperature fluid or steam wastes have used this waste heat for electricity production. Roughly 52 GW of combined heat and power (CHP) was installed in the U.S. as of 1998, providing about 9% of total electricity production. Europe is far ahead of the U.S. in CHP installation, exceeding 30% in the Scandinavian countries and widely being used in the climate strategies of the U.K., Denmark, Sweden, the Netherlands and Germany.

There is enormous potential to expand the use of CHP. For example, the chemicals industry uses only about 30% of its CHP potential and has used only 10% of useable sites. A CHP plant in Stockholm has a net overall efficiency of 76% compared to an average efficiency of just 36% for non-CHP plants in the European Union.

All U.S. conventional power plants together convert only one-third of their fuel into electricity, thus wasting two-thirds as waste heat, which is equivalent to the total energy use of Japan. The Trigen Corporation’s cogeneration installation increases system efficiency 2.8 times, harnessing 90-91% of the fuel’s energy content, providing electricity costing only .5-.2 cents/kWh. Fully adopting this one innovation would profitably reduce total carbon dioxide emissions of the U.S. by about 23%. Selling waste heat from industrial processes to others within affordable distances could cost-effectively save about 45% of Japanese and 30% of U.S. industrial energy, or 11% of U.S. total energy.

However, a variety of barriers including hostile utility policies, excessively onerous environmental permitting requirements, lack of regulatory recognition of CHP benefits and unfavorable tax treatment, limit CHP growth in the U.S. It has been estimated that legislative and regulatory action to remove these barriers could result in an additional 50 GW of installed CHP by 2010 and 144 GW by 2020 in the U.S., with a net savings that pays back the first cost in 4-5 years on average. These policy changes are estimated to achieve carbon reductions of about 27 million tons/year in the industrial sector and 7 million tons in other sectors by 2010.

District Heating

District Heating involves the use of a single heating generator to warm and cool multiple homes in a community. Considerable energy can be saved in defined or newly planned communities by using district heating instead of less efficient heating units for each building or each dwelling unit in the community. District heating is widely used in Europe, particularly in the Scandinavian countries.

Transportation Efficiencies

Cars and light trucks currently account for 56% of transportation energy use. The efficiency of vehicles can be greatly improved through using lighter weight materials and smaller vehicles, reducing wind resistance, improving tire performance and improving the combustion efficiency of engines.

New vehicle propulsion systems are being adopted and designed which can greatly reduce or avoid altogether the use of fossil fuels, namely: electric vehicles with regenerative braking systems; electric/hybrid vehicles that combine electric motors with small, more efficient internal combustion engines; fuel cell-driven vehicles utilizing hydrogen as their fuel; and vehicles propelled by propane gas or ethanol. Toyota is now mass-producing the Prius hybrid car in Japan. Toyota and Honda are planning to introduce in the U.S. market their two mass-produced electric hybrid vehicles with 50-75% improved fuel efficiency in 2000.

Plants for the manufacture of cellulosic ethanol for use as a vehicle fuel or additive are being constructed in a number of U.S. states including Louisiana, California and New York. Argentina established a program in 1984, which has resulted in there now being 450,000 compressed natural gas vehicles in use there.

Many of these new transportation technologies are now being used around the world, particularly in buses and for automobile fleets. The use of natural gas busses has been adopted for Flanders and Brussels in Belgium, Denmark, France and Hungary (which is replacing its old diesel engines with new compressed natural gas for all its buses in Budapest). Brazil has pioneered in growing energy crops for conversion to ethanol as a vehicle fuel. Brazil initially subsidized the manufacture of ethanol adapted vehicles (the subsidies have since been eliminated). This program has avoided the need and costs of major imports of gasoline and has significantly reduced automobile-derived pollution.

Other significant measures to reduce transportation energy use include: land use planning to avoid urban/suburban sprawl that requires the use of vehicles for access to essential services; promotion of mass transportation facilities that are much more energy efficient than vehicles; promotion of car pooling; van transport to work; and HOV lanes restricted to multi-passenger occupied vehicles on highways; elimination of free parking and imposition of parking fees at business and institutions; and promotion of pedestrian and bicycle paths, bicycle parking facilities, and urban bicycle lanes.
Energy Efficiency, continued from Page 23

Energy efficiency measures almost always result in savings to the producer, the consumer and society. They are usually inexpensive compared to new power construction and are capable of financing out of the savings achieved. For developing countries, the initial installation of energy efficient products and processes enables them to leapfrog to use of the superior technologies, thus avoiding the experience of most developed countries in having to convert inefficient products or processes to efficient ones, incurring a double cost and, while the inefficient products are in use, incurring electricity and environmental costs arising from their use.

Footnotes

1 This paper assumes the correctness of the IPCC findings re the high risks of climate change derived from increases in carbon dioxide emissions.

2 Richard Ottinger is Dean Emeritus of Pace University School of Law, founder of the Pace Energy Project and former Member of Congress and Chair of the House Energy Conservation Committee. Mindi Jayne is a Pace Law School student and Research Assistant to Dean Ottinger at the Pace Energy Project.

3 As well as protection and enhancement of carbon sinks, promotion of sustainable agriculture and methane emissions with which we will not deal in this paper.

4 Goldemberg, et. al., Energy for Development, World Resources Institute (Washington, DC, 1986) at p. 57. The challenge was well put as follows: If today’s most energy-efficient technologies were adopted in developing countries, then only about one kilowatt per capita used continuously – roughly 10 percent more than is consumed now – would be sufficient to raise the average standard of living to the level enjoyed by Western Europe in the 1970’s.


Studies show conclusively that a supply-oriented strategy that both accepts current projections of development energy demand and seeks to satisfy them based on acquiring capital-intensive technologies requiring imported fuels is doomed to failure. To the extent that their energy needs are thus met, it will be at horrendous cost of capital desperately needed for economic and social improvement in non-energy sectors and with tragic environmental consequences to developing countries and to the world. Energy in Developing Countries, Office of Technology Assessment, U.S. Congress, OTA-E-486 (Washington, DC 1991).


A 1997 study estimated that aggressive adoption of energy efficiency measures could result in net gains of nearly 800,000 jobs in the U.S. by 2010. Lovins, supra note 6 at 1.


11 Advanced refrigerators alone can save over 90% of the energy used by standard models today, thus not only reducing carbon dioxide emissions but also eliminating climate and ozone disrupting CFC’s from insulation and refrigerants. Lovins, supra note 7 at 7.


13 Mills, Evan, Fuel-based Light:
Large CO2 Source, 23 (8) International Association for Energy-Efficient Lighting Newsletter 1 (Feb. 1999).

Id.


15 Id.  

16 Mills, supra note 14.

17 Id.

18 Lovins, supra note 7 at 6.

19 Akabari, supra, note 15.

20 Major international agency study pending publication.


22 Id.

23 Id.

24 Lovins, supra note 7 at 7.


26 Geller, H. S. Nadel et. al, Approaching the Kyoto Targets: Five Key Strategies for the Unites States, American Council for an Energy-Efficient Economy (Washington, DC, Aug. 1998) at 33. 1996 U.S. electric generator emissions were 517 MMT, projected by the U.S. Energy Information Agency to grow to 663 MMT by 2010 under its Reference Case Forecast. Id.


28 Lovins, supra 7 note at 6.  

29 Suozzo, supra note 23.

30 Lovins, supra note 7 at p. 6.

Better catalysts with matching heat to temperature needs can save 70% of the remainder with a 2-year payback. Id.


32 Lovins, supra note 7.

33 Id.  

34 Id.  

35 Id.

36 Id.

37 Suozzo, supra note 7 at p. 7.

38 Geller et. al., supra note 34 at 25-29.

39 Smith et. al., supra note 36 at 17.

40 GM has announced development of cars with half the weight and drag of current models and hybrid drive. Ford has road-tested a 40% lighter than its current cars 6-passenger car with hybrid drive. Before the merger, Daimler-Benz pledged to making 100,000 fuel cell cars a year by 2005 and Chrysler had developed a molded-polymer composite “China car” with half the weight of Neon, 15% lower cost, 80% lower investment and 86% lower factory space getting 60 mpg. Lovins, supra note 7 at 7.  

41 Geller & Bernow, supra note 31 at 10.


44 For example, Denver, CO is expecting to incur a 1% fuel expenditure decrease per year and a 1.5% reduction in carbon dioxide emissions per year from its Green Fleets program by reducing the number of vehicles in its municipal fleet, decreasing the number of vehicle miles traveled, and focusing on buying only fuel efficient vehicles. By 2005, the Green Fleets program is expected to decrease its transportation expenditures by $106,000, and reduce carbon dioxide emissions 22%. These savings will be incurred despite the fact that the actual number of miles driven by the municipal fleet will have increased 19%. See Cities for Climate Protection, Green Fleets Program, (last visited Mar. 14, 2000) <http://www.icelci.org/cases/e002-dgf.htm>.
Nuclear Letter, continued from Page 16

We appreciate the opportunity to bring our concerns to your attention. We believe that these issues are of such significance to the citizens of New York that they need to be addressed prior to any decision by the PSC to allow the transfer of ownership of nuclear plants in New York. We look forward to your reply and would be interested in meeting with you as soon as possible to discuss these issues and what actions might be taken.

Sincerely,

Ed Smeloff, Pace Energy Project

A COMMENTARY

Vieques, continued from Page 20

...sultations with the commissioners to speak of, nor with the Vieques leadership, nor with the Vieques people, the ones who will be ultimately affected.

17. The Directive allows the resumption of the bombardment practices over Vieques, for at least three additional years, with the possibility of being continued indefinitely provided that the Vieques people consent. The classification of ordnance as “inert bombs” or “non explosive ordnance” is immaterial. First, because the Commonwealth’s policy on Vieques did not distinguish between any classes of bombs; and second, because “inert bombs” are as dangerous as the “live bombs.” This was borne out by the tragedy of the death of David Sanes last April, which was preceded by incidents of bombs that missed their targets and hit buildings and schools in the civil area of Vieques. Those were “inert bombs” and did not kill anybody then only because the structures were empty as they fell down.

The Navy has repeatedly failed to fulfill its commitments and obligations to Puerto Rico. The Memorandum of Understanding of 1983 was never honored by the Navy, and neither the Directive, nor the letter of Gov. Rosselló have any mechanisms to assure future compliance by the Navy with either the terms of the Memorandum or the Directive.

As Congressman Luis Gutiérrez has expressed, “telling the Vieques people ‘let me bomb you for three little more years’ is like telling Ms. Rosa Parks to keep on seating on the back of the bus for three more years, to tell African Americans and Hispanics to accept discrimination for three more years. That is unacceptable.”

No agreement or directive will do justice to Vieques if it does not include a permanent halt to the Navy practices, its eventual exit from Vieques and the complete restoration of the Vieques environment.
In Memoriam: Dr. Oleg Stepanovich Kolbasov

Environmental Law lost one if its great progenitors and friends on January 30, 2000. Dr. Oleg Stepanovich Kolbasov died in Moscow, after a short and intensive 6 month fight against pancreatic cancer.

Oleg was the vice-Chair of the Steering Committee of IUCN’s Commission on Environmental Law (CEL) and for 20 years was the co-chair of the USA-USSR Joint Committee on Cooperation in the Field of Environmental Protection.

From his post-graduate legal work in the early 1950s on water resource law, he evolved a career devoted to establishing ecological law throughout the former Soviet Union, and internationally through his work as a Member of the CEL. He established the sector on Ecological Law of the Institute of State & Law of the Academy of Sciences of Russia, and trained the first two generations of environmental legal specialists from throughout the former USSR. He fostered comparative environmental reforms with Italy and taught many of the first environmental law courses in Eastern Europe.

As the USSR was disbanded, he was called to serve as Deputy Minister of the Russian Federation’s Environment Ministry. There he was instrumental in establishing the regional environmental agreement for the Caspian Sea in 1991, and was a leader of the Russian Delegation to the 1992 UN Conference on Environment & Development in Rio de Janeiro. He also was instrumental in establishing official Russian support for the Aarhus Agreement on Public Participation, handling negotiations during his term in the Ministry. For two decades, he served as Russian Co-Chair of bilateral Environmental Law negotiations under the 1972 USA-USSR Agreement on Cooperation in the Field of Environmental Protection, furthering the design of an international park across the Bering Straits and strengthening Russia’s law on environmental impact assessment. His extensive teaching in both the USA and USSR advanced mutual understanding and a lessening of tensions in the Cold War.

Prof. Kolbasov generously contributed his time to the All Russia Society for the Protection of Nature and to local conservation groups. He was the national Chairman of the Russian Society for Animal Protection. He used his legal skill and position to defend the strict nature preserve (“zapovednik”) system from encroachment. He was instrumental in defining Russia’s new system of national parks. He tirelessly traveled to advise local authorities on how to implement and enforce environmental laws, and urged his postgraduate students to do the same.

As the Vice Chair of the IUCN CEL, in 1998 he established the Centre for Ecological Law Eurasia, as the first centre of excellence in environmental law for Russia. His prolific scholarship literally defined the scope of contemporary “Ecological Law,” both throughout Russia and the now independent Republics of the former USSR. Throughout his career, he sought to bring the laws of human society, whether in Russia under socialist or today’s post-socialist market system, or internationally, into accord with the “laws of nature.”

Pace University honored Dr. Kolbasov with an LL.D. in 1986.

He leaves two children Irina Krasnava and Vladimir Kolbasov, and three grandchildren.

The world of environmental law is poorer for his passing, but ever so much richer for his life.

Footnotes

1 “Inert bombs” or “non explosive ordnance” are filled with shrapnel and other explosives, they are filled with reinforced concrete, gases and heavy metals. They have destructive capacity in the immediate area of impact, including structures in the inner range area, to the corals and any nearby wildlife.


3 See Ramírez de León, Naval Bombardment of Vieques, Puerto Rico Violates Human Rights: An Environmental Disaster Looms, Environmentally Friendly Vol. 3 Fall 1999.

4 The DU, when released to the environment, represents serious hazards to human health. DU is mostly used as an armor piercing shell, and also as an “anti-bunker” bomb. On impact, up to a 60% of the DU contained in an explosive device volatilizes, thus releasing the extremely dangerous uranium to the atmosphere. Once in the air, within minutes it can easily reach the populated areas in Vieques, such as Isabel Segunda or La Esperanza. It has been estimated that a single 5-micrometer particle of reduced uranium trapped in a human lung is capable enough to emit radiation to the adjacent tissue equivalent to more than 800 times the amount of radiation allowed by health and regulatory authorities to a single human being in one year. See Ramírez de León, supra, at 20.

About the authors. José L. Ramírez de León is a Senior Staff Attorney at the Environmental Quality Board (EQB) of Puerto Rico. He holds an LL.M. in Environmental Law from Pace University School of Law. Alejandro Torres Rivera is a private attorney specializing in civil rights, environmental and labor law matters. Photos taken by Orlando Silva, EQB.
In Print:


Distinguished Professor M. Stuart Madden’s latest article entitled “Joint and Several Liability and Environmental Harm in the 1990’s” is published at 9 Fordham Envtl. L. J. 483 (1998).

Madden & Owen on Product Liability (West Group 3d ed 1999) written by Professor Madden (with David G. Owen and Mary J. Davis) was published on December 27, 1999.

The Second Edition of Professor James J. Fishman’s casebook Non-profit Organizations (Foundation Press, 2d ed. 2000) (with Stephen Schwarz) has been published.

On the Net:

Director of Environmental Programs Robert J. Goldstein is the author of three articles on the Internet. The articles, include, In Floyd’s Wake: Discovering a River Nobody’s Noticed for Years, (reprinted on page 4); Deconstructing George W’s Website; and Is John McCain’s Head Out of the Smog? All can be found at TomPaine.common sense, an Internet journal of opinion (http://www.tompaine.com).

The Pace National Environmental Moot Court Competition finals were broadcast live via the Internet. The Moot Court’s web site contains applications, rules, schedules and briefs. The site is at http://www.law.pace.edu/pacelaw/environmentalm/.