



Agricultural Management Committee Newsletter

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MESSAGE FROM THE CHAIRS

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For this issue, the Section of Environment, Energy, and Resources' (SEER) Agricultural Management Committee and International Environmental Law Committee (IELC) join forces for the fourth straight year to cover the critical nexus of agriculture management and international environmental law. We are also pleased to welcome as a co-sponsor the International Environmental Law Committee of the ABA Section of International Law.

Some of the most timely and significant global environmental issues sit at the confluence of international environmental and agricultural law. For example, the environmental impacts of transboundary agriculture and regulatory barriers to entry for agricultural commodities raise issues that cross borders and require global cooperation. The benefits and risks of biotechnology continue to spark discussion, such as in the European Union, where the European Commission recently granted approval for cultivation for a genetically modified plant—the Amflora potato—for the first time in 12 years. At the same time, energy, food and climate security are increasingly linked. For instance, greater meat consumption in some countries has led to a concern at the U.N. Food and Agriculture Organization over the contribution of livestock to global warming.

Accordingly, this year's joint edition includes four articles and a case law summary covering a broad array of international environmental and agricultural issues and analyses. First, Tom Redick provides an opening case law update on international environmental regulatory and liability issues related to agriculture. Mr. Redick focuses on litigation in Germany concerning use of genetically modified organisms, the Argentine-

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Thomas P. Redick, Editor**

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Uruguayan dispute at the International Court of Justice regarding the application of the Convention on Biological Diversity (CBD) to a case involving non-point source pollution, and the World Trade Organization dispute concerning the United States' Country of Origin Labeling (COOL) scheme.

Next, Carlos Ramos-Mrosovsky offers a fascinating discussion of the Alien Tort Statute (ATS)—cited by plaintiffs alleging sterilization from pesticide use—and its application in the environmental arena. He focuses on the recent Second Circuit decision in *Abdullahi v. Pfizer*, 562 F.3d 163 (2d Cir. 2009). Mr. Ramos-Mrosovsky explains that *Abdullahi* allowed an ATS action to be brought on the basis of a customary international law norm prohibiting nonconsensual medical experimentation on human subjects. He concludes that the Second Circuit may have made it easier for plaintiffs to prove the existence of an actionable customary international law norm.

In a second article, Tom Redick next examines the potential promise of biotech trees as a source of fiber, food, and fuel. He discusses the state of their development, including biotech American chestnut trees, and then analyzes China's need for wood, paper, and tree plantations to replace those removed in the country's drive for economic development. He provides a useful discussion of talks under the rubric of the Convention on Biological Diversity designed to manage the release of biotech trees into the marketplace. These include rules for liability and redress geared toward preventing the unwanted spread of any invasive genetically altered tree. He concludes that the biotech tree industry will be one to watch in the coming years.

Andrew Schatz then provides a thorough summary of domestic and international developments concerning climate change, an issue of concern for agriculture in terms of emissions, offsets, adaptation and mitigation. He begins by noting that in December nations adopted the Copenhagen Accord. He concludes that the Accord represents a significant advance because it established many of the key foundations to a successor treaty. He also discusses the U.S. House of Representatives' passage of Waxman-Markey, and pending bills in the Senate, and observes that the U.S. Environmental Protection Agency has begun the process of moving toward regulation of greenhouse gas

(GHG) emissions by making an endangerment finding and taking other actions under the Clean Air Act. These developments are significant to agricultural management for two reasons. First, the agricultural sector is one of the most vulnerable to a changing climate, as a variety of climate-related factors may have negative impacts on global productivity. Second, Waxman-Markey provides an example of proposed legislation seeking to make agriculture part of the solution to climate change, by providing biofuel incentives and emission allowances for projects that help reduce GHG emissions.

Finally, shifting across the Atlantic, Valerie Fogelman provides valuable insight into European Union (EU) efforts to meet its GHG emission reduction goals through the sequestration of carbon dioxide (CO₂) or, as it is known in the EU, carbon capture and storage (CCS). After an informative background discussion of the legislative process in the EU, Ms. Fogelman explains how the legal framework for commercial deployment of CCS has been established in the EU. She notes that the EU's CCS Directive should allow deployment of this important technology to begin in approximately the 2015–2020 time frame.

We would be remiss if we did not remind you to start planning now to attend SEER's 18th Section Fall Meeting in New Orleans, Louisiana from September 29-October 2, 2010. The meeting will focus on the BP oil spill and the fallout from Katrina, and EPA Administrator Lisa Jackson has been invited back to her hometown to serve as the conference's keynote speaker. IELC will be sponsoring a program on compliance by multinational enterprises. SEER will also do a tree-planting public service project in Ms. Jackson's old neighborhood. CLE sessions include Katrina-related content (e.g., climate litigation updates, disaster preparedness) and timely titles, such as "Finding Legal Opportunities in the Green Energy Economy: Where's the Work?"; "Practice makes Permit Perfect"; "Renewable Energy and the Endangered Species Act: Advancing Sustainable Energy While Protecting Wildlife"). These sessions will also include the usual inside stories, this time from governmental general counsels and litigators (e.g., Department of Energy, Department of Justice). For litigators, SEER will have a litigation workshop on preparing experts and challenging their testimony using facts and legal issues from the Fifth Circuit's climate change case, *Comer v. Murphy Oil*. We hope to see you there.

INTERNATIONAL AGRICULTURE- ENVIRONMENTAL CASE LAW UPDATE

Thomas P. Redick
Global Environmental Ethics Counsel

The following is a periodic update on current international issues at the intersection of environmental and agricultural law.

German Farmers Sue the EU for Right to Plant Biotech Corn

In Germany, three farmers sued for compensation for economic loss caused by a nationwide ban on MON810 rootworm-resistant corn (MON810). Germany requires farmers to report on their intent to grow biotech crops (thereby enabling the destruction of such crops by anti-biotech activists), and had a statute imposing liability for release of such crops to other farms. A number of fearless farmers (mainly from Franconia, Saxony and Brandenburg) had registered over fifty locations for 2010 production of MON810. In April 2009, during the 2009 corn planting season, Germany's Agriculture Minister imposed a ban on cultivation of MON810, which the EU had found safe for planting across the EU. Monsanto sued to reverse this decision at the Administrative Court. The new federal government of Germany, which has reversed past opposition to biotech crops, has agreed to allow this judicial clarification of the Minister's ban.

The Farmers sued the Federal Office for Consumer Protection and Food Safety (BVL), for compensation of 30,000 Euros. They had duly provided notification of their intent to use 2009 MON810 seeds and listed their areas of cultivation. The farmers claim that the ban denied them access to an "effective and environmentally sound" means to combat pests (citing an unusually strong infestation of European corn borer that caused significant yield losses and income losses in 2009). The use of conventional pesticides was ineffective. According to the farmers, the "illegal ban" caused their economic damage. The government may see similar additional complaints from farmers in 2010 if the ban on MON810 is not lifted. Since the European Food Safety Authority (EFSA) conducted a

new safety assessment after activists raised new allegations of potential harm, and the EFSA found no evidence of any adverse health or environmental impacts, there is little room for a planting ban under current EU policy.

The EU is also considering, however, whether to allow various member states (Austria, Poland, etc.) to maintain bans on planting (or zones where no planting of biotech crops will be allowed). The EU doctrine of “subsidiarity” allows national governments to decide local issues, which may include whether to allow genetically modified (GMO) crop cultivation on their land.

Argentina Sues Uruguay at the International Court of Justice for Water Pollution, Citing Convention on Biological Diversity

In a dispute at the International Court of Justice (ICJ) between Argentina and Uruguay, Argentina seeks to use the Convention on Biological Diversity (CBD) to enjoin transboundary environmental harm from neighboring states. In this case, Argentina sued Uruguay for water pollution emanating from a paper plant (pulp mill) and non-point source runoff from agriculture and forestry, on the Uruguay River, which flows into Argentina. Argentina argued that under the Statute of the River Uruguay (Feb. 26, 1975) (River Statute), Uruguay and Argentina agreed to protect the river, and subsequent international environmental agreements (including the CBD) imposed related obligations. In particular, Argentina argued that the CBD imposed an obligation on Uruguay to protect the biodiversity of the Uruguay River and its associated environment, citing CBD Article 2.

Uruguay argued in reply that the term “sustainable use” did not impose an obligation on states to avoid *all* long-term depletion of biological resources and natural ecosystems. Rather, in Uruguay’s view, Article 8 allows measured, progressive adoption of conservation measures when “possible” and insofar as they are “appropriate.” It also contends that Article 8 was deliberately drafted in such a way as to leave considerable discretion to individual states in protecting

resources. Uruguay argued that its full compliance with the River Statute is clearly demonstrated by the fact that the International Finance Corporation (IFC) and its independent panel of experts have concluded that, in terms of their environmental performance, the two plants will be “among the best in the world” according to the IFC’s 2006 “Cumulative Impact Study, Uruguay Pulp Mills.” Uruguay emphasized that conserving biodiversity does not mean preserving every living thing. In other words, the CBD does not require parties to preserve the natural environment in an unchanged and unchanging state. *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, Rejoinder of Uruguay (July 29, 2008), available at International Court of Justice, <http://www.icj-cij.org/docket/files/135/15432.pdf> ¶¶ 1.31, 5.43–5.45, 5.48. On April 20, 2010, the ICJ delivered its judgment. See *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, available at <http://www.haguejusticeportal.net/eCache/DEF/1>. The ICJ held that Uruguay had breached the 1975 treaty for failing to negotiate and for failing to inform the Administrative Commission of the River Uruguay, but denied relief. Argentina failed to prove that discharges from the mills have caused harm to living resources or to the ecological balance of the river, however, so ordering the dismantling of the mill or ordering compensation would not be an appropriate remedy for a breach of a merely “procedural” obligation.

U.S. Court Ruling Supports Country of Origin Labeling—Mexico’s WTO Claim

In February 2010, the cattle producer organization R-CALF USA obtained a ruling from the U.S. District Court for the Eastern District of Washington, finding the country-of-origin labeling law (COOL) consistent with the North American Free Trade Agreement (NAFTA), which opened up markets in the U.S.-Canada-Mexico trading relationship. *Easterday Ranches, Inc. v. U.S. Dept. of Agriculture*, No. CV-08-5067-RHW, 2010 WL 457432 (E.D. Wash. Feb. 5, 2010) Though unrelated to World Trade Organization (WTO) proceedings, R-CALF USA believes that this federal court decision will aid the U.S. government in its defense of the labeling law at the WTO.

The Mexican and Canadian governments have complained to the WTO that COOL is an illegal technical barrier to trade, as a form of process-production method that protects a domestic industry from competition. In October, Mexico and Canada filed WTO complaints against the United States alleging that COOL is an unlawful restriction of international trade. They argue that meat processed in the United States should qualify for labeling as a U.S. product, even if the animals were not born in the United States. The U.S. District Court for the Eastern District of Washington found in *Easterday Ranches, Inc.* that the U.S. COOL law complied with NAFTA rules because COOL affects retail sales, while NAFTA regulates tariffs and trade obligations (query whether such obligations include labeling for geographical origin which lacks any distinction in product qualities). Mexican cattle producers see adverse impacts from COOL since the Mexican producers cannot ship young cattle to the United States to be fed, slaughtered, and processed there as U.S. beef under COOL. See Sara Haimowitz, *Backers of Meat Labeling Law Hail Court Ruling* (Feb. 9, 2010), available at [www.tradereform.org/content/view/2392/40/](http://www.tradereform.org/content/view/full/2392/40/).

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ABDULLAHI V. PFIZER: IMPLICATIONS FOR ENVIRONMENTAL CLAIMS UNDER THE ALIEN TORT STATUTE

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Since the beginning of the modern era of litigation under the Alien Tort Statute (ATS), 28 U.S.C. § 1350, plaintiffs have sought to use the ATS to hold U.S. companies liable for toxic releases and other kinds of environmental injury overseas. Most recently, a group of Brazilian plaintiffs filed an ATS claim against Eli Lilly, Dow Chemical, and several other large corporations alleging that pollution caused in Brazil by these defendants amounted to “poisoning and spoliation of . . . drinking water and food sources” in violation of “health and safety standards to which the United States and other civilized nations subscribe.” See *Vieira v. Eli Lilly and Co.*, No. 1:09-cv-00495-RLY-JMS (S.D. Ind. Sept. 25, 2009).

ATS claims based on environmental damage and toxic releases have historically met with relatively little success. The uncertain weight of most instruments addressing international environmental law has made it difficult for plaintiffs to prove the existence of a customary international law tort actionable under the ATS. A recent Second Circuit decision, *Abdullahi v. Pfizer*, 562 F.3d 163 (2d Cir. 2009), which allowed an ATS action to be brought on the basis of a customary international law norm prohibiting nonconsensual medical experimentation on human subjects, may signal a development advantageous to environmental as well as other plaintiffs proceeding under the ATS.

The ATS was enacted as part of the Judiciary Act of 1789 to provide foreigners a federal remedy “for a tort only, in violation of the law of nations or a treaty of the United States.” At that time, a very limited number of torts—likely only assaults on ambassadors, violations of safe conducts, and piracy—were considered actionable under the law of nations, that is, under customary international law. Since the Second Circuit’s decision in *Filartiga v. Pena-Irala*, 630 F.2d 876 (2d Cir. 1980) recognized a cause of action for state-sponsored torture under the ATS, however, the statute has become the primary vehicle for litigation of international human rights cases in U.S. courts.

Subsequent decisions have made clear that private companies may be held secondarily liable for human rights abuses by foreign regimes under such theories as “aiding and abetting” liability. *See Khulumani v. Barclay Nat’l Bank*, 504 F.3d 254 (2d Cir. 2007). This has fueled an explosion in ATS litigation: from the perspective of the plaintiffs’ bar, claims against private entities will generally be a much better proposition than suits against foreign human rights violators. Such individuals will often be shielded by sovereign immunity and the act of state or political question doctrines—or themselves judgment-proof fugitives. Corporate defendants are readily subject to personal jurisdiction, less able to assert sovereignty-based or prudential defenses, and acutely sensitive to bad publicity.

The core problem facing ATS plaintiffs, however, is the nebulous nature of customary international law, which lacks both a central legislator and standard for assessing the respective weight that should be accorded various indicia of its contents. Creative lawyers can derive international norms out of a myriad of international agreements, the history of state practice taken from a sense of legal obligation (*opinio juris*), and countless non-binding declarations, statements of principle, and pronouncements by both governments and—more controversially—international and even non-governmental organizations (NGOs). In an effort to filter out all but the most firmly established causes of action under customary international law, the Supreme Court has ruled that the only claims actionable under the ATS are those based upon a norm of customary international law as “specific, universal and obligatory” as the norms against piracy, assaults upon ambassadors and violations of safe conducts were in 1789. *See Sosa v. Alvarez-Machain*, 542 U.S. 692, 733 (2004). *Sosa* also warns courts to be “vigilant doorkeepers” and to consider the “practical consequences” of recognizing new causes of action under the statute. *See* 542 U.S. at 729, 732.

Courts have accordingly recognized very few causes of action in ATS cases. These include torture, genocide, crimes against humanity, war crimes, slavery and extrajudicial killing. State authorities must usually be involved in some way to make a tort *international*, since sovereign states are the primary objects of international law. Yet even before *Sosa*, courts repeatedly refused to find a norm of customary international law supporting claims for environmental

harm under the ATS. *See Flores v. S. Peru Copper Corp.*, 414 F.3d 233, 266 (2d Cir. 2003) (finding insufficient evidence “to establish that international pollution violates customary international law”); *Sarei v. Rio Tinto PLC*, 221 F. Supp. 2d 1116, 1159 (C.D. Cal. 2002) (dismissing a claim that environmental damage from mining operations in New Guinea was actionable under the ATS because “allegations of environmental harm do not state a claim under the law of nations”).

ATS plaintiffs have thus tried to shoehorn environmental claims into causes of action that do not fit the facts particularly well. In *Abagninin v. AMVAC Chemical Corp.*, 545 F.3d 733 (9th Cir. 2008), for example, Ivorian banana and pineapple plantation workers, who alleged that they had been rendered sterile by defendants’ use of certain pesticides, sued on a theory of “genocide” and “crimes against humanity.” As detailed in the February 2009 issue of this newsletter, these claims were dismissed. *See* Thomas P. Redick, Jennifer Willis & Dan McLean, *International Agriculture-Environmental Regulatory Update*, 11 INT’L ENVTL. LAW COMM. NEWSLETTER 1, 6 (Feb. 2009). Similarly, in *Vietnam Association for Victims of Agent Orange v. Dow Chemical Co.*, 517 F.3d 104 (2d Cir. 2008), plaintiffs unsuccessfully sought to frame the use of herbicides by the U.S. military in Vietnam, including on and around U.S. bases, as a war crime. The *Agent Orange* court disagreed largely because plaintiffs could not allege that the herbicides were intentionally used as a weapon. *Id.*

Against this background, the Second Circuit’s decision in *Abdullahi*, a case arising out of allegations that Pfizer did not follow proper consent and testing protocols while conducting drug trials in Nigeria, may make it easier to bring ATS claims on the basis of toxic spills, pesticide poisoning, and other kinds of environmental damage overseas.

One of the most important aspects of the *Abdullahi* decision is that the Second Circuit, while paying homage to *Sosa*, appears to have made it much easier for plaintiffs to “prove” the existence of an actionable customary international law norm. Despite a vigorous dissent, the Second Circuit accorded great weight to the very kind of non-binding and aspirational materials that compose a considerable part of international environmental law and of whose value as evidence of

an actionable norm the *Sosa* court was particularly skeptical. For example, the *Abdullahi* court found the United Nations' International Covenant on Civil and Political Rights (ICCPR) to be "potent authority for the universal acceptance of a norm against nonconsensual medical testing," 562 F.3d at 180, notwithstanding the Supreme Court's characterization of the ICCPR as an aspirational document of "little utility" in defining international obligations. *Sosa*, 542 U.S. at 734. The *Abdullahi* court also placed significant weight on ethical declarations adopted by international medical NGOs, such as the World Medical Association and the Council for International Organizations of Medical Sciences, 562 F.3d at 197, and characterized the fact that most states require informed consent in their domestic laws regulating medical research as important evidence of state practice. *Id.* at 198; *cf. Sosa*, 542 U.S. at 737 n.27 (refusing to find an actionable international norm in a multiplicity of national-level enactments).

The Second Circuit's approach in *Abdullahi* suggests that such aspirational but nevertheless significant international environmental law documents as the United Nations Stockholm Declaration on the Human Environment, 1972, 11 I.L.M. 1416 (1972) and Rio Declaration on Environment and Development, 31 I.L.M. 874 (1992), both of which were rejected as sources of an actionable norm in *Flores* and *Sarei*, may now constitute viable evidence of customary international law norms actionable under the ATS. Environmental ATS plaintiffs may also look to such instruments as the Stockholm Convention on Persistent Organic Pollutants, 40 I.L.M. 532 (2001), the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes, 28 I.L.M. 649 (1989), or even the MARPOL 73/78 Convention for the Prevention of Pollution from Ships, 17 I.L.M. 546 (1978), in arguing for the recognition of environmental causes of action under customary international law and the ATS. *Abdullahi* also invites plaintiffs to cite various regional environmental laws as evidence of state practice rather than purely domestic legislation.

The Second Circuit's recognition of a new ATS-actionable norm "prohibiting medical experimentation on human subjects without their consent," at least when defendants acted in concert with a sovereign state or under color of state law, *Abdullahi*, 562 F.3d

at 187, may also prove helpful to environmental plaintiffs. Though well short of an ATS-actionable norm prohibiting massive environmental damage or toxics releases, *Abdullahi*'s cause of action is significantly closer to environmental harms than are genocide or war crimes. It therefore presents plaintiffs with a narrower gap to bridge with analogies. Significantly, while a genocide claim may require a specific intent—as did the "war crimes" theory unsuccessfully advanced in *Agent Orange*—the *Abdullahi* defendants were not accused of deliberately harming the plaintiffs, but rather of not using proper consent protocols in testing what all parties hoped would be a beneficial drug.

This is much closer to the intent standard applicable in an ordinary toxic tort action. Although specific factual situations are hard to predict, it is not too difficult to imagine how a "medical" patina might attach to fact patterns involving genetically modified crops, or "testing" alleged on the basis of a company's comparison of yields from the use of different kinds of pesticides or fertilizers. State action could potentially be satisfied in any case where a corporate defendant works in a government resource concession or in a joint venture with some form of state-owned entity. In addition, as with the history of common law torts, rather than those recognized by customary international law, judicial recognition of one new cause of action facilitates the recognition of the next.

Pfizer has sought certiorari in *Abdullahi*, and the Supreme Court may well narrow or reverse the Second Circuit's decision. ATS plaintiffs face numerous other doctrinal and practical hurdles, and most courts will remain skeptical of environmental ATS claims. Even so, the Second Circuit's decision remains an important indication of how far some courts may be willing to expand ATS jurisprudence and of the methodology they may employ in doing so. International environmental lawyers would do well to keep their eyes on this case.

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TIME TO TAKE TRANSGENIC TREES?

Thomas P. Redick

Global Environmental Ethics Counsel

This article will review the current state of innovation in recombinant DNA plant breeding of trees using modern biotechnology (biotech trees) and the regulatory process at home in the United States and abroad.

A. Regulatory Considerations in Release of Biotech Trees

Back in 2000, the U.S. Department of Agriculture (USDA) biotechnology coordinator Michael Schechtman promised that commercial approval of a biotech tree would be considered “in an open and public process” wherein USDA would review “environmental, scientific and other issues that need to be carefully considered and addressed before genetically engineered trees are used commercially.” Rick Weiss, *Biotech Research Branches Out*, WASH. POST, Aug. 3, 2000, available at http://www.biotech-info.net/branching_out.html. At that time, test plots of biotech apples, pines, and poplars were “dream trees” that were “part of a little-noted biotech revolution in forestry that experts [predicted would] hit its commercial stride in the next five years.” By 2005, USDA’s Web site listed field trials of 63 tree species.

In 2010, however, these biotech “dream trees” are still in dreamland, waiting for long field trials to conclude and regulatory approval before any can hit their commercial stride. As this article was going to press, the USDA announced—on May 13, 2010—the *approval of a permit to allow ArborGen to move forward with field testing of its freeze-tolerant eucalyptus trees, moving a step closer to commercial approval. This article illustrates some of the challenges ahead for biotech trees.*

A National Academy of Sciences (NAS) Board report in 2008 suggested the beginnings of a consensus within the forest science community about studying the impact of genetically engineered (GE) trees on the environment, finding:

- Greenhouse and small-scale plantings will continue, but they are insufficient to address ecological risks.

- Ecological risks of perennial species cannot be modeled using annuals like corn or soybeans.
- The efficacy of biological confinement has not been evaluated in the field over the long term.
- Modeling is essential, in conjunction with field data collection.
- Not all traits and species are equal, so prioritization must take place.
- Absolute versus relative risk must be taken into account.
- Proxy learning can come from intensively managed systems or natural hybrids.
- Learning by doing is required.

Trees pollinate widely and may require the first commercialization of the technology used to make trees sterile so that they cannot commingle their genes with other trees. The biotech industry calls the tools “Genetic Use Restriction Technologies” (GURTs) while activists prefer a less cumbersome and colorful “terminator technology” description.

The objections to GURTs that were raised with respect to biotech crops were based primarily on grower practices involving the saving of seed from year to year, which is the dominant model in parts of the developing world. Most growers in the United States use high-yielding hybrids and certified seed, and only would use saved seed when the good seed runs out. While the practice of seed saving is of minor commercial importance in the main grain-producing nations, the use of GURTs has been so controversial that Monsanto opted not to use this in cotton and other crops. With biotech trees, however, there are good reasons to use these genes and key innovators (e.g., ArborGen, the leading biotech tree company in the United States) are willing to make use of them.

Setting up field trials at even pre-commercial scale is beyond the resources of what an individual academic or federal laboratory can undertake, so partnerships with the private sector may be necessary to meet regulatory approval criteria. One such example, as is noted above, would be ArborGen’s biotech eucalyptus for bioenergy uses, which USDA granted an application to commercialize, after which activists

promptly filed a court challenge under the National Environmental Policy Act. This will provide a test case for similar trees working their way into the U.S. market.

International Paper's ArborGen joint venture with MeadWestvaco Corp. and New Zealand's Rubicon Ltd. is seeking permission from USDA to sell the first genetically engineered forest trees outside of China. The Australian eucalyptus trees are designed to survive freezes in the U.S. South. Plantations of engineered trees would give International Paper a competitive advantage by providing a reliable supply of lower cost wood at a time when timberlands are dwindling because of development.

The quarter million genetically engineered eucalyptus trees that ArborGen wants to allow to flower are genetic duplicates of a single Brazilian tree. The Summerville-based forest research lab has asked USDA to permit the flowering of trees planted at 28 sites in seven states, including South Carolina. Industry analysts suggest ArborGen could boost its yearly sales to \$500 million in 2017 from \$25 million by following Monsanto's blueprint for commercializing engineered plants.

Anti-biotech activist groups are not standing idly by, as these field trials progress. Sierra Club's Neil Carman told USDA in comments, in fact, that these trees bring increased fire risk and extraordinary water consumption. Some commentators suggested that the GURT would not be 100 percent effective, and ostensibly infertile trees in existing field trials would produce a few fertile seeds. These comments led USDA to "re-release" the Environmental Impact Statement for ArborGen's eucalyptus trees, with the comment period closing February 18, 2010.

This is not the first biotech tree to seek commercial acceptance. The biotech papaya tree was the first widely produced biotech tree in the United States, and it is credited with saving U.S. papaya production from a devastating viral infection. This is currently the only commercially produced biotech tree in the United States, and also one of about four food-only biotech crops (most biotech crops go into animal feed, fiber and biofuel). Summer squash and zucchini have seen limited commercial introductions in the United States, along with biotech sweet corn.

A virus resistant plum tree is also seeking regulatory approval, having received a positive food safety consultation letter from the FDA in early 2009, deregulated status by USDA, and EPA review via a 2004 United States EPA Scientific Advisory Panel Report on Plant Incorporated Protectants using viral coat proteins (EPA 2004). However, the tree is still under regulatory consideration at EPA under the Federal Insecticide Fungicide and Rodenticide Act, with a proposed registration that was open for public comment through April 1, 2010. With pressure from plum pox increasing in parts of the United States, there may be a market for this tree, as there was for papaya.

B. The Unique Case of American Chestnuts

With food-yielding GE papayas on the market and plums not far behind, there may be room for a GE nut tree in the not-too-distant future. In his new book *Whole Earth Discipline*, Stewart Brand discusses the planting of chestnuts by Native Americans long before the arrival of European settlers. This near-monoculture may have contributed to the loss of billions of American chestnut trees from chestnut blight in the first half of the 20th century (1900–1950). American chestnuts were sold by the railroad car in the cities of the eastern United States and its wood was highly prized for durability. Brand suggests that innovation in biotech forestry could help create a more sustainable society by bringing back the American chestnut. In the age of carbon offset credits, this promise of "blight-resistant backcross hybrids" could create sustainable planting of American chestnut trees for future carbon sequestration programs. Douglass F. Jacobs, Marcus F. Selig & Larry R. Severeid, *Aboveground Carbon Biomass of Plantation-grown American Chestnut (Castanea dentata) in Absence of Blight*, 258 *FOREST ECOLOGY & MGMT.* 288–94 (June 30, 2009), available at www.sciencedirect.com.

In 2009, the USDA Forest Service, in cooperation with a power company (Duke Energy) and a foundation (the U.S. Endowment for Forestry and Communities), formed the Forest Health Initiative (FHI). See www.foresthealthinitiative.org (last visited Mar. 23, 2010). FHI is a "collaborative effort to advance the country's understanding and role of biotechnology to address some of today's most pressing forest health challenges." To restore this

species to wild forests, FHI will employ plant breeding tools of biotechnology and apply for regulatory approval to allow flowering and propagation of a genetically modified (GM) American chestnut. FHI plans to build on the extensive research already accomplished on the American chestnut by the American Chestnut Foundation and others as a model system for how biotechnology can potentially protect trees.

The first step will be to safely and effectively develop an American chestnut that resists chestnut blight and root rot. Researchers have biotech versions of the American chestnut in sapling form, too young to determine their viability against the fungus. This could restore the original American chestnut—fast growing to 100 feet tall—back to its former glory in the forests of the eastern U.S. Press Release, UGA Researchers Could Help Restore Devastated American Chestnut (July 11, 2009), *available at* http://www.acf.org/pdfs/news/2009/7-July/UGA_Researchers_Could_Help_Restore_Devastated_American_Chestnut.pdf. The first “test trial” trees will reveal “new approaches to enhance the health and vitality of other trees, forests, and forest ecosystems.” FHI, *Advancing Forest Health Through Biotechnology* (2009), *available at* www.foresthealthinitiative.org/index.html.

These biotech chestnut trees will have to coexist with other chestnut trees (of European or Asian genetics) that are grown in the United States, some of which are exported to nations like Korea. In the United States, demand for locally grown chestnuts exceeds limited supply, which is offset by imports. The long-term goal is to develop a thriving domestic chestnut industry using European and Asian chestnut trees and hybrids. Michael A. Gold, Mihaela M. Cernusca & Larry D. Godsey, U.S. Chestnut Market Report (June 2005), http://www.agmrc.org/media/cms/chestnutmarketreport_3FE47A5CA2BFC.pdf. A 2004 survey of U.S. chestnut producers (using European and Asian chestnuts or hybrids) revealed producers in 15 states (top four are Michigan (21%), Oregon (16%), California (12%), and Washington (8%)). The University of Missouri Center for Agroforestry (UMCA) wants to establish a viable chestnut industry by breeding chestnut cultivars and

consumer awareness and demand in a nation long-deprived of adequate domestic supplies of chestnuts. *See* K. Hunt, M. Gold & W. Reid, *Growing Chinese Chestnuts in Missouri*, Agroforestry in Action, University of Missouri Center for Agroforestry (2002), *available at* <http://agebb.missouri.edu/umca/pubs/chestnut.pdf>.

To promote stewardship and transparency when introducing these trees, the FHI might follow the “Responsible Use Principles” issued by the Institute for Forest Biotechnology. <http://www.responsibleuse.org>. These principles and practices were developed with input from a broad range of stakeholders in the United States and abroad for users of biotech trees that want to follow good stewardship practices.

C. International Regulation and Export-Related Concerns

While the biotech papaya’s success arguably saved an industry from collapse, this also came at the cost of exports to certain concerned Asian nations with mandatory GM food labeling laws. Under heavy virus pressure, papaya production had dropped by 40% when the biotech papaya was first commercially planted in 1998. *See Uphill Struggle for Hawaii’s Biotech Papayas*, Cropchoice (Japanese exports alone account for 40% of Hawaii’s fresh papaya market), *available at* www.cropchoice.com/leadstry9a4f.html?recid=95. About a third of Hawaii’s papaya crop is exported to Japan, and somewhere between 5 and 10 percent is exported to Canada; most of the rest goes to U.S. consumers.

While Canada approved biotech papayas, Japan’s approval process for biotech food takes much longer. It did not help to have a straying illegal transgenic papaya show up in Japan in January 2002. Reuters, *Japan Steps Up Checks on GM Papaya Imports from U.S.* (Jan. 28, 2002), *available at* http://archives.foodsafety.ksu.edu/agnet/2002/1-2002/agnet_january_28.htm. In Asian nations, including Japan, mandatory GM food labeling can lead food buyers to shun all biotech content, for fear of alarming consumers with a “warning label”—thus making a bigger market for “non-GMO” papayas (and

effectively denying consumers any choice in what they pay for papaya). Hawaiian papaya farmers encountered international competition with Dole, which used Filipino producers to reap non-GMO premiums at 300–700 percent premium over biotech papayas.

D. Is the Biotech Industry Ready to Use Grower Districts?

Given the broad pollination profile of trees, growers of these biotech trees may find that they require novel coexistence strategies to avoid adverse economic impacts to non-GM trees of similar species. For example, chestnuts grown conventionally may be bound for export to nations that have not approved them for food use (and like the papaya that illegally entered Japan, a chestnut might violate import laws).

Domestic non-GM chestnuts can coexist with FHI's future biotech versions of the American chestnut through well-planned farmer cooperation using voluntary coexistence approaches. This could include grower districts (such as exist in the northwestern states for canola and industrial rapeseed). The University of Missouri's chestnut-breeding Horticulture and Agroforestry Research Center is located in one of the few states—and the only one in the Farm Belt of the Midwest—to have a Grower District Authorization Act that enables formation of production zones. This is ideally suited for creating coexistence between any locations. Such districts have proved effective in segregating non-food canola from its food-grade relatives, grown miles away in a segregated district, and in contrast to the non-GMO zones of California and Europe, creating such a district is voluntary.

E. International Issues

1. Biotech Trees in China

The first biotech tree in the world was an herbicide-tolerant poplar with the “aroA” gene. China developed this biotech black poplar tree in 1987 and has planted about 1.4 million since commercialization in 2002. Once marketed, China's State Forestry Administration lost track of precise locations of biotech poplars due to the ease of propagation and marketing of GM trees and the difficulty of distinguishing biotech poplars from

“non-GM” trees without a costly genetic test. Moreover, nursery salesmen at markets get higher prices by saying—true or not—that their planting materials are biotech trees. As a result, tracing the locations of these wide-pollinating million-plus poplars, when materials are moved from one nursery to another, will be exceedingly difficult. See Fred Pearce, New Scientist, *China's GM Trees Get Lost in Bureaucracy*, available at <http://www.newscientist.com/article/dn6402-chinas-gm-trees-get-lost-in-bureaucracy.html>.

China has the world's fastest-growing pulp and paper market with 14 per cent of global paper consumption. China has a growing need for wood and paper, and diseases, pests, salinity of soils, development pressure, and other threats to trees have denuded large tracts of land and put riparian ecosystems at risk of erosion. See Huoran Wang (Chinese Academy of Forestry, Beijing), *The State of Genetically Modified Forest Trees in China*, United Nations Food and Agriculture Organization (FAO) report, available at <http://www.fao.org/docrep/008/ae574e/AE574E08.html/>; Dietrich Ewald, Jianjun Hu & Minsheng Yang, *Transgenic Forest Trees in China*, in TREE TRANSGENESIS, RECENT DEVELOPMENTS (Matthias Fladung & Dietrich Ewald eds., 2006) (excerpt available at <http://www.springerlink.com/content/p3m204142700243w/>). China wants about 6 million hectares of biotech tree plantations to reverse decades of deforestation that have left China facing serious droughts, loss of topsoil, and deadly floods. The World Bank has loaned China over \$600 million to establish tree plantations. China's use of biotech poplars appears to have helped it manage devastating losses of topsoil to rivers, through riparian planting of fast-growing, pest-resistant biotech poplars.

Starting in 2006, China commercialized virus resistant biotech papaya that a Chinese university developed and grew on approximately 3,500 hectares in 2007. While China has a mandatory GM food labeling law, this does not appear to have deterred producers and end users of the papaya fruit.

China is a party to the international treaties that will govern the launch of biotech trees—the Convention on

Biodiversity (CBD) and Cartagena Protocol on Biosafety (which regulates biotech organisms). These international agreements present significant potential for risk management across boundaries, but will use the “precautionary approach”, which raises the potential for regulatory barriers at the international level.

2. Proposed Biodiversity Convention Moratorium Dying on the Vine?

Trees came up again at the Ninth CBD Conference of the Parties in 2008, where 156 of the 168 CBD parties continued the discussion of the threat posed by GM trees and the use of “terminator” seeds. A large group of NGOs signed a statement requesting a moratorium on release of biotech trees (mainly African and European parties) asking the CBD to ban biotech trees. The United States (non-party to the CBD), Argentina and Canada argued that that countries should be able to use their own national regulations to deal with any biosafety or contamination issues. The decision from this meeting nevertheless reaffirms a “precautionary approach” to these trees, which would mandate extensive long-term studies in containment, including greenhouse and confined field trials to avoid “possible negative environmental impacts on forest biological diversity” and potential socio-economic impacts on the livelihoods of indigenous and local communities. Under the CBD decision, members are allowed to ban the controversial trees in their own countries but with no international agreement, which

means neighboring nations might not be protected by contaminated pollen blown across national borders from neighboring countries.

This is where the transboundary liability negotiations—under Biosafety Protocol Article 27—may soothe some of the fears concerning biotech trees. Article 27 of the Protocol, subtitled “liability and redress,” directs the adoption of a process for international rules and procedure in the field of liability and redress, which should allow nations to stop the unwanted spread of any invasive GM tree. The biotechnology industry is creating a voluntary compensation and arbitration scheme (the “Compact”) to address harm to biodiversity caused through the fault of a biotech seed company, subject to the customary defenses in negligence law.

Conclusion

Biotech trees appear to have a place in this world, providing fiber, fuel and even sustainable comfort food (e.g., chestnuts roasting on an open fire). This is an industry to watch, as it evolves toward “responsible use” and takes its place in the pipeline of sustainable biotech products.

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The background of the flyer features a close-up, artistic photograph of a plant with long, thin, curved leaves and small, round, reddish-brown seed pods, possibly a species of tree or shrub.

CLIMATE REGULATION TAKES SHAPE, BUT UNCERTAINTY PREVAILS

Andrew Schatz
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The past year has seen the greatest movement to date on domestic and international efforts to combat climate change. Yet much remains to be realized on both fronts as these efforts are found to be increasingly and precariously intertwined. On the domestic front, in June 2009 the House of Representatives passed H.R. 2454, the *American Clean Energy and Security Act of 2009* (ACES), the first comprehensive climate change legislation to pass any chamber of Congress. Members are eagerly awaiting Senate action on a parallel bill, which will ultimately require a bipartisan coalition of 60 votes for passage. Regardless of whether Congress acts on climate change, the Environmental Protection Agency (EPA) is implementing its own plan, having already set the wheels in motion to regulate greenhouse gases (GHGs) under the Clean Air Act (CAA). Yet it is far from certain whether final passage of U.S. climate legislation, and particularly unlikely that EPA action alone, will be enough to convince the rest of the world to agree to aggressive measures to reduce GHG emissions. These issues were largely left undecided at Copenhagen, where industrialized nations and major developing nations brokered the *Copenhagen Accord*, a non-binding political agreement to limit temperature increases by 2 degrees Celsius through emissions reductions and increased financial aid to the developing world. As the world waits for the U.S. Senate to act, the fate of the first truly global climate change treaty remains unclear.

Copenhagen

From December 7-18, 2009, representatives from 193 countries to the United Nations Framework Convention on Climate Change (UNFCCC) met in Copenhagen, Denmark to negotiate an international agreement to curb greenhouse gas emissions and combat the effects of climate change. With no U.S. climate legislation in place before the start of negotiations, few predicted a binding successor treaty to the Kyoto Protocol would be finalized at

Copenhagen. In this sense, Copenhagen did not disappoint. Although no binding commitment was reached to reduce global emissions and significant progress remains, Copenhagen was significant in that many of the key foundations to a successor climate treaty were established, particularly regarding likely commitments by the United States and major developing economies, such as China, India, and Brazil.

Perhaps the most significant development to come out of the negotiations was the willingness of the United States and several major developing nations to agree to reduce domestic GHG emissions. President Obama jumpstarted the conference by proposing a U.S. short-term target to reduce GHGs by about 17% below 2005 levels by 2020, and a long-term goal to reduce emissions by 83% below 2005 levels by 2050. This proposal was met by criticism, from the developing world in particular, which sought to also hold the U.S. accountable for its unrealized Kyoto commitments. Careful not to repeat the mistakes of the Clinton Administration at Kyoto, where the U.S. committed to emissions reductions opposed by Congress, the U.S. proposal largely followed emissions cuts prescribed in the House bill. However, if the Senate is unable to reach a similar deal, the U.S. proposal could be in jeopardy.

Prior to the conference, China and India also announced voluntary pledges to reduce the carbon intensity of their economy by 40-45% and 20-25%, respectively, below 2005 levels by 2020. These offerings were also criticized by industrialized nations as insufficient, who believed that China's goals could already be achieved under existing policies. Only a handful of other developing nations offered voluntary reductions, including Brazil, Costa Rica, Indonesia, the Maldives, Mexico, the Philippines, Korea, Singapore, and South Africa. The European Union (EU) once again led the way, having already committed itself to reduce emissions 20-30% below 1990 levels by 2020, with the higher figure dependent on greater GHG reductions from other parties.

While these proposed emissions reductions were never incorporated into a binding agreement, they likely

represent the minimum efforts nations will commit to if a final treaty is agreed upon. Nonetheless, many parties, particularly from vulnerable developing nations, believed that the proposed emissions reductions were wholly insufficient to stem the tide of dangerous anthropogenic climate change or to even achieve the Copenhagen Accord's stated goal of maintaining temperature increases below 2 degrees Celsius. Developing country demands also threatened to tie up the entire process on several occasions as negotiators sought to achieve consensus among 193 different countries, a nearly impossible task.

Ultimately, disputes over three key issues—financing, verification, and the continuation of the Kyoto Protocol—nearly led to the collapse of the entire talks. These issues were partly resolved in the last few days, most notably when President Obama forcibly engaged a recalcitrant China, India, Brazil, and South Africa to come to terms on an emissions verification process for emerging economies. The parties ultimately produced the six-page *Copenhagen Accord*, which enumerated the foundations for a future treaty, although in often ambiguous terms. For example, whereas UNFCCC rules require unanimous consent, the Conference of the Parties begrudgingly “took note” of the accord rather than adopting it, because six developing nations rejected the document. With all the major parties agreeing to or at least “associating themselves” with the accord, it now serves as an important, yet incomplete foundation for future action. It is still, however, a political declaration and it remains to be seen how the accord may be used, if at all, in a final agreement or series of agreements.

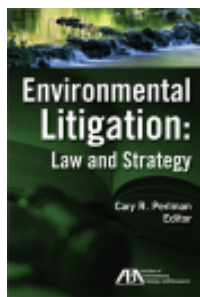
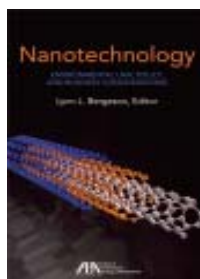
Under the accord, the developing world will receive significant financial assistance to reduce domestic emissions and adapt to a changed climate. The parties agreed to establish the Copenhagen Green Climate Fund to provide \$30 billion in immediate assistance to the developing world over the next three years. In the long-term, developed countries agreed to support a goal of providing \$100 billion a year in funding by 2020 to assist the developing world with technology transfer, climate mitigation and adaptation. Funding will come from a wide variety of sources, including public, private, and multilateral institutions. The parties also

stated their intention to establish a new technology mechanism to accelerate development and transfer in support of action on adaptation and mitigation.

The parties also agreed to establish a two-track negotiating process, which would create a new set of national commitments different from parties' obligations under the Kyoto Protocol. This drew the ire of many developing nations, which sought to build off of industrialized nations' prior commitments under Annex I of the Kyoto Protocol. The accord provided that

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industrialized countries would commit to implement, individually or jointly, quantified economy-wide emissions targets for 2020. Industrialized nations' plans reflecting the aforementioned proposals were later submitted for inclusion in Appendix I to the accord. Likewise, several developing countries, including major emerging economies, agreed to implement Nationally Appropriate Mitigation Actions, and also submitted their voluntary pledges for inclusion in Appendix II to the accord. These pledges largely reflect mitigation efforts proposed at Copenhagen.

But no issue proved more contentious than verification of developing nations' mitigation efforts. American negotiators and senators back home demanded "transparency" from developing nations to provide evidence that they plan to live up to their end of the bargain. Chinese officials proved particularly inflexible, grinding the last week of negotiations to a halt, calling foreign verification an affront to national sovereignty. Not until the 11th hour did the Chinese and others developing nations relent, agreeing to conduct domestic measurement, reporting and verification of domestic mitigation actions, which would be reported to the UNFCCC Secretariat every two years through national communications.

The accord also called for immediate establishment of a mechanism to prevent deforestation and the loss of carbon sinks associated with such activities. Negotiators almost finalized the details for the Reducing Emissions From Deforestation and Forest Degradation – plus (REDD-plus) program, which would compensate countries for preserving forests, and other natural landscapes, such as peat soils, swamps and fields. It remains to be seen whether REDD-plus will be approved immediately or have to wait until the next round of negotiations.

Despite the progress made, many parties were severely disappointed with the accord's failure to create binding mid-term or long-term commitments and the exclusion of the expected goal of concluding a binding treaty by the end of 2010. Prior drafts of the accord were much more ambitious, committing developed nations to a long-term target of reducing their GHG emissions by 80% by 2050, and setting a

collective joint emissions reduction of 50% by 2050. Parties were also upset that the accord failed to set a deadline for adopting a global treaty, stating only that the agreement should be reviewed and put in place by 2015.

Thus, future negotiations remain to resolve many of the unsettled issues left at Copenhagen. As a result of growing frustrations with the consensus-based process, it is expected that significant negotiations will be conducted outside the UNFCCC framework by the major world economies. The first of these meetings took place from April 18–19 in Washington, D.C., at the Major Economies Forum, where 17 countries accounting for 80 percent of global GHGs sought to achieve greater consensus.

Formal negotiations resume May 31–June 10 in Bonn, Germany at the UNFCCC Secretariat, while the 16th Conference of the Parties is slated for November 29–December 10, 2010 in Cancun, Mexico. Two to three negotiating sessions under the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG-KP) and the Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA) have also been scheduled to hash out an agreement. AWG-KP and AWG-LCA negotiation sessions were held in Bonn April 9–11 and are also scheduled for May 31–June 11 and August 2–6, 2010.

Notwithstanding these efforts, if climate legislation dies in Congress and President Obama cannot deliver on his pledge to reduce emissions by 17% below 2005 levels by 2020, the fate of a comprehensive climate treaty may go by the wayside.

Congressional Action

Congress began 2009 with great hopes of passing comprehensive climate legislation, culminating with the House of Representatives' passage of ACES. Also known as "Waxman-Markey," after its lead sponsors, ACES would for the first time cap national GHG emissions, mandating a 17% reduction below 2005 levels by 2020, a 42% reduction by 2030, and an 83% reduction by 2050. A cap-and-trade program

serves as the primary mechanism for achieving these reductions, limiting economy-wide emissions from stationary sources emitting over 25,000 tons per year of GHGs (i.e., utilities, large manufacturers, refineries, natural gas distributors, among others), but allowing them to trade emissions allowances on an open market. The bill seeks to limit energy price hikes for customers by providing free allowances to utilities and tax rebates or credits to low and moderate income households. Approximately 20% of allowances will be auctioned in the beginning of the program, increasing to around 70% by 2030. Allowances will also be given to energy intensive, trade-exposed industries, refineries, and other users to facilitate their transition to a low carbon economy. Allowances are also reserved for programs to promote renewable energy and energy efficiency. The bill provides for allowances to fund efforts to prevent deforestation in the developing world, a provision widely supported by other nations at Copenhagen.

In addition to cap-and-trade, ACES takes several measures to increase energy efficiency and promote a renewable energy infrastructure. The bill establishes a Renewable Portfolio Standard, requiring electric utilities to meet 20% of their electricity demand through renewable energy and energy efficiency by 2020. It also mandates energy-efficiency standards for buildings, appliances and industry, imposes stricter performance standards for new coal-fired power plants, and increases funding for carbon capture and storage (CCS) technology. Finally, the bill would temporarily supplant state cap-and-trade programs between 2012 and 2017, while limiting, to some extent, EPA's ability to regulate GHGs under certain sections of the CAA.

Since House passage, climate legislation has languished behind health-care and financial reform in the Senate, lurching forward at a snail's pace. Prospects for 2010 passage have dimmed steadily in light of a restless electorate, a weak economic recovery, the loss of a sure vote in Massachusetts, and the clock ticking down towards election day. Calls have grown from apprehensive mid-western senators for a pared down energy-only bill, while Senator Lisa Murkowski (R-AK) plans to introduce a disapproval resolution (S.J.

Res 26) to overturn the EPA's Endangerment Finding. If climate legislation fails to pass the Senate, it seems all but likely that international climate talks will unravel. Thus, what started as the most promising year ever for climate legislation may end like previous years.

In spite of these challenges, efforts are underway for a bipartisan bill to combat climate change and increase domestic energy production. Senators Kerry (D-MA), Graham (R-SC), and Lieberman (I-CT) have worked to forge a bipartisan consensus, but these efforts hit a major road bump when Senator Graham removed his name as a co-sponsor of the legislation due to concerns that the Obama administration and Senate leadership were not pushing hard enough for a climate bill.

Without their partner, Senators Kerry and Lieberman introduced the *American Power Act*, which would establish a sector-based cap-and-trade system, dramatically expand aid to the nuclear industry, promote CCS technology, and allow for offshore drilling. Once considered unthinkable to Democrats, these latter elements may now be their best hope to reach across party lines and forge a 60-vote coalition. The bill establishes nearly identical emissions reduction targets as ACES, but seeks carbon reductions from the utility, manufacturing, and transportation sectors, rather than an economy-wide emissions cap. In the utilities sector, emissions would be capped annually, but trading would be permitted between regulated entities only. This functions much like a "cap-and-dividend" proposal put forth by Senators Cantwell (D-WA) and Collins (R-ME), which also limits carbon trading by Wall Street. The bill seeks to limit the cost of carbon regulation on the manufacturing sector by delaying the sector's entrance into the cap-and-trade system until 2016 and offering allowances to energy-intensive and trade-exposed industries until 2036. In the transportation sector, emissions allowance trading will be prohibited, and instead, companies will have to buy quarterly carbon allowances based on the average auction price in the previous quarter.

In response to growing economic concerns, the bill pledges to return two-thirds of the revenue generated from auctioning carbon allowances back to consumers

to offset increased energy costs. Other funds are set aside for nuclear loan guarantees, incentives for clean energy manufacturing and research and development, and CCS. However, the proposed text offers substantially less aid to prevent international deforestation than ACES, which could jeopardize international negotiations. The bill also establishes greater price certainty by creating a price collar, limiting introductory carbon prices to a floor and ceiling of \$12 and \$25 per ton CO₂ equivalent (CO₂e), which will both increase with inflation.

Despite the senators' best efforts, it remains unclear whether the bill will reach the Senate floor. The gulf oil spill has jeopardized support for increased offshore oil drilling, which could imperil the votes of coastal lawmakers. Ultimately, soliciting the votes of 60 members will be a tall order in this political climate.

That said, if the threat of irreversible climate change and the prospect of failed international negotiations do not bring 60 senators to the table, perhaps the threat of EPA regulation will scare enough into a compromise (or encourage a delay or limit on EPA authority). Faced with the prospect of an extremely rigid GHG command and control regime administered by bureaucrats under the CAA, many members of the regulated community would much prefer the flexibility of an economy-wide cap-and-trade system.

EPA Trudges On

Not waiting for Congress to act, the EPA already has announced plans to regulate GHGs pursuant to its authority under the CAA. On December 7, 2009, the EPA issued its Endangerment Finding for GHGs, concluding under the CAA's mobile source section that GHGs endanger public health and welfare, and that GHG emissions from motor vehicles contribute to climate change. *See* 74 Fed. Reg. 66,496 (Dec. 15, 2009). The determination was a direct response to the Supreme Court's decision in *Massachusetts v. EPA*, 549 U.S. 497 (2007), holding that because GHGs are considered "air pollutants" under § 202(a) of the CAA, EPA has authority to regulate them if it determines that they endanger public health or welfare.

Although the Endangerment Finding does not itself impose any requirements on regulated entities, it sets in motion a chain of events culminating in the regulation of GHG emissions from stationary sources under the CAA. First, it is the predicate for EPA's rule, signed jointly with the Department of Transportation (DOT) on April 1, 2010, to create GHG emission standards and corporate average fuel economy (CAFE) standards for light-duty vehicles (e.g., cars, light-trucks). *See* 74 Fed. Reg. 49,454 (proposed on Sept. 15, 2009); 75 Fed. Reg. 25,324 (finalized on May 7, 2010). This will dramatically improve fuel economy, requiring automobile companies to meet a combined average fleet of 250 grams of CO₂ per mile, or 35.5 miles per gallon by 2016. Additionally, on May 21, 2010, President Obama directed the EPA and DOT to create GHG and CAFE standards for medium- and heavy-duty trucks for Model Years 2014-2018, which currently average only 6.1 miles per gallon. He also directed the agencies to extend the national program for cars and light-duty trucks to Model Years 2017-2025.

The implications of the initial mobile source rule cannot be overstated. According to EPA, as soon as the rule "takes effect" on January 2, 2011, GHGs will become "subject to regulation" under the CAA and therefore must be regulated from stationary sources as well. Stationary sources producing relatively low threshold quantities of GHGs would become subject to the Title V and Prevention of Significant Deterioration (PSD) permitting programs, and potentially stringent pollution controls associated with the latter. In a related rulemaking, EPA announced that the rule would "take effect" no earlier than January 2, 2011, so that PSD for GHGs would not be triggered until that date. 75 Fed. Reg. 17,004 (Apr. 2, 2010).

In anticipation of the automobile GHG standard triggering PSD for stationary sources, EPA recently finalized a "Tailoring Rule" to raise the statutory threshold for regulation under the PSD and Title V programs to insulate smaller GHG sources from being subject to such requirements. *See* 74 Fed. Reg. 55,292 (Oct. 27, 2009) (proposed rule); 75 Fed. Reg. 31,514 (June 3, 2010) (final rule). Under the CAA, sources emitting 100 or 250 tons per year (tpy) of a

“regulated pollutant” are subject to the PSD program, while Title V permitting requirements apply to sources emitting 100 tpy or more. By increasing these thresholds to 75,000 or 100,000 tpy of GHGs under the final rulemaking, EPA hopes to protect smaller entities, such as small farms and businesses, from the prospect of onerous GHG controls. While significantly paring down the number of potentially regulated entities, the final Tailoring Rule would still cover 67% of GHG emissions from stationary sources in the United States.

Under the final rule, EPA will phase in the PSD and Title V permitting requirements in two initial stages. First, between January 2, 2011 and June 30, 2011, only sources currently subject to the PSD permitting program for pollutants other than GHGs would be subject to additional permitting requirements for their GHG emissions under PSD. Thus, where a new or modified source exceeds significant emissions thresholds for a traditional PSD pollutant and *also* increases GHGs by 75,000 tpy CO₂e, it will be required to install Best Available Control Technology (BACT) to reduce GHG emissions.

These controls are determined on a case-by-case basis during the PSD permitting process, taking into account, among other things, the cost and effectiveness of the control technology. While BACT has yet to be determined, it is very likely to carry significant teeth for new and modified facilities, and will undoubtedly be less flexible than purchasing carbon credits to offset a facility’s emissions. Similarly, only sources currently subject to the Title V operating permit program would be required to meet applicable GHG requirements. No sources would be subject to CAA permitting requirements based solely on their GHG emissions at this time.

Under Step 2 (July 1, 2011 to June 30, 2013), new construction projects emitting at least 100,000 tpy CO₂e of GHGs and modifications of existing facilities increasing GHG emissions by 75,000 tpy CO₂e will be subject to PSD permitting requirements, regardless of whether they significantly increase emissions of any other pollutant. Title V operating permit requirements will apply to sources emitting at least 100,000 tpy of

GHGs. The rules will require certain sources, such as solid waste landfills and industrial manufacturers, to acquire permits for the first time.

Finally, EPA plans on exploring a third step, which may expand permitting requirements for sources emitting at least 50,000 tpy of GHGs, but will not require permitting for facilities emitting below that threshold. Sources exceeding the 50,000 tpy threshold would not be subject to permitting requirements until at least April 2016.

As part of this flurry of new climate change regulatory activity, EPA also approved a Mandatory Greenhouse Gas Reporting Rule, requiring fossil fuel or industrial GHG suppliers, vehicle and engine manufacturers, and facilities emitting greater than 25,000 tpy GHGs to submit annual reports to EPA reporting their emissions. 74 Fed. Reg. 56,260 (Oct. 30, 2009). The information gathered will be used to create a national GHG registry covering 85-90% of national emissions, while also informing future policy decisions. Facilities must commence monitoring on January 1, 2010 and submit to EPA their first annual reports containing 2010 data by March 31, 2011.

In February 2010, the White House Council on Environmental Quality proposed guidelines for considering the impacts of major federal actions on climate change, and vice versa. Under the proposed guidelines, the National Environmental Policy Act would apply where a federally approved project or program would result in at least 25,000 tpy of direct CO₂e emissions. The final guidelines are expected shortly.

Going Forward

Although most of EPA’s measures are sure to be challenged in court, they represent an extremely critical foundation for greenhouse gas controls in the U.S. Whether or not Congress passes climate change legislation, EPA action under the Obama Administration has all but ensured that U.S. businesses will operate in a carbon-constrained environment. Interestingly, it may be equally critical to the regulated community as it is to the rest of the world that

Congress pass climate legislation in 2010, and it has already had an effect on States' and companies' plans to build new plants.

Yet even if EPA takes aggressive measures to curb GHG emissions, it likely will not be enough to satisfy international demands for large scale reductions across the economy. If Congress is unable to pass climate legislation with the most favorable Democratic majorities in decades, other nations may come to believe the U.S. will never aggressively tackle climate change. Failure in 2010 would also erode any hope that the Senate can approve an international climate treaty, reinforcing these concerns. Faced with a go it alone approach, emerging developing nations like China and India may forego their climate efforts – a risk the world can ill afford to take. With so much at stake for individuals, businesses, and the planet, ultimately, the world waits to see whether climate legislation survives the U.S. Senate.

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CARBON SEQUESTRATION IN THE EUROPEAN UNION

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The European Union (EU) has committed to achieving a 20 percent reduction in emissions of greenhouse gases by 2020 compared to 1990 levels (or 30 percent if other developed countries commit to comparable reductions), with a longer term commitment of approximately 70 percent compared to 1990 levels. The EU recognizes, however, that it cannot attain this goal without also sequestering carbon dioxide (CO₂). Part of its climate change package, therefore, includes sequestration or, as it is known in the EU, carbon capture and storage (CCS), that is, the capture and separation of CO₂, its transportation to a storage site, and its permanent storage in a geological formation.

This article discusses the legal framework for CCS in the EU. In order to set the discussion in context, it first provides a brief overview of EU institutions, legislation and procedures as well as other EU climate change legislation.

European Union Legislation

Environmental legislation in the EU is drafted by the Directorate-General for the Environment (DG Environment), one of over 40 Directorates of the European Commission. In February 2010, DG Climate Action was split off from DG Environment. The Commission submits proposals for directives to the European Parliament and the Council of the EU (also known as the Council of Ministers). Environmental legislation is generally enacted as a directive, that is, flexible legislation which the 27 Member States (MS) of the EU transpose by bringing into force domestic laws, regulations and/or administrative provisions to achieve the objectives set out in the directive. The domestic legislation must be at least as stringent as the directive. The process is somewhat similar to cooperative federalism in the U.S. The legislation of

each MS should, however, enter into force by the deadline set out in the directive for its transposition. Further, the directive remains in force. Domestic legislation is not approved by an EU institution and, if there is a difference between the stringency of the directive's provisions and those of the domestic legislation, the directive is supreme.

After the European Commission has proposed a directive, the proposal is considered by the relevant committee(s) of the European Parliament and by the environment working party of the Council. The European Parliament holds the first reading of the proposed directive, as may be amended, following which the Council considers and votes on the new draft. If the Council votes in favor of the draft legislation, which equates to its first reading of it, it adopts what is known as a common position. If the draft directive continues through the legislative process, the European Parliament and the Council ultimately adopt a joint text that is published in the *Official Journal of the European Union* (OJ). During the legislative process, the Commission submits its views on amendments to its initial proposal. Other EU institutions such as the Economic and Social Committee and the Committee of the Regions may hold hearings and issue opinions on the Commission's proposal.

The European Commission enforces EU legislation by, among other things, monitoring whether a MS has transposed a directive into its domestic law by the deadline. If an MS fails to do so, the Commission commences infringement proceedings. A continued failure to transpose a directive may ultimately result in the Commission bringing proceedings in the European Court of Justice (ECJ). Other functions of the ECJ include interpreting provisions of EU legislation in cases brought by applicants or on referral by a court of an MS.

There is no equivalent of the U.S. Environmental Protection Agency in the EU. Competent authorities selected by each MS are responsible for enforcing the domestic legislation that has transposed a directive and for enforcing other EU environmental legislation.

EU Climate Change Legislation

The EU and its MS ratified the Kyoto Protocol in 2002. *See* Council Decision 2002/358/EC concerning the approval, on behalf of the European Community, of the Kyoto Protocol to the U.N. Framework Convention on Climate Change and the joint fulfillment of commitments thereunder, [2002] OJ L130/1. Also in 2002, the European Commission identified climate change as a priority for action in its Sixth Community Environment Action Programme for 2002 to 2012.

Legislation enacted by the EU to achieve its commitment to reduce greenhouse gas emissions includes a directive to establish minimum levels on the energy performance of new buildings and existing buildings that are subject to major renovation as well as the energy certification of new and existing buildings. Directive 2002/91/EC on the energy performance of buildings. [2003] OJ L1/65. Other Directives promote renewable energy. *See, e.g.*, Directive 2003/30/EC on the promotion of the use of biofuels or other renewable fuels for transport. [2003] OJ L123/42. Further climate change legislation requires a reduction of greenhouse gas emissions from motor vehicles. *See, e.g.*, Regulation (EC) No 443/2009, setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO₂ emissions from light-duty vehicles, [2009] OJ L140/1.

A key Directive established the first international trading scheme for CO₂, known as the EU emissions trading scheme (EU ETS). Directive 2003/87/EC establishing a scheme for greenhouse gas emissions allowance trading within the Community and amending Council Directive 96/61/EC, [2003] OJ L275/32. The Directive provides, among other things, that an operator to whom the EU ETS applies must surrender a specified number of CO₂ emission allowances each year for each relevant facility. The operator may trade (buy and sell) ETS allowances, each of which represents one ton of CO₂ equivalent, in order to be able to surrender the specified amount each year. The EU ETS is being extended to include aviation sources of GHG emissions. Directive 2008/101/EC amending Directive 2003/87/EC so as to include aviation

activities in the scheme for greenhouse gas emission allowance trading within the Community. [2009] OJ L8/3. It may eventually be extended to include shipping.

Directive on the Geological Storage of Carbon Dioxide

On January 23, 2008, the European Commission proposed a Directive on the geological storage of CO₂. The Directive entered into force on June 25, 2009, 20 days after it was published in the OJ. Directive 2009/31/EC on the geological storage of carbon dioxide (CCS Directive), [2009] OJ L140/114. The deadline for its transposition into the domestic law of MS is June 25, 2011.

Application and Amendments to Existing Legislation

The Directive introduces a legal framework for only the storage of CO₂. The legal framework for the capture and transportation of CO₂ is achieved by amendments in the CCS Directive to existing Directives. They include Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment, [1985] OJ L175/40, which will apply to CO₂ pipelines. This Directive is somewhat similar to the National Environmental Policy Act. Another amended Directive is Directive 2008/1/EC concerning integrated pollution prevention and control (IPPC), [2008] OJ L24/8, the main environmental permitting regime in the EU. The IPPC Directive is currently being revised into a Directive on industrial emissions that will incorporate other Directives.

The CCS Directive also amends existing legislation in order to remove legal barriers to the injection of CO₂ into geological formations. *See* Directive 2000/60/EC, establishing a framework for Community action in the field of water policy, [2000] OJ L327/1 (Water Framework Directive); Directive 2006/12/EC on waste, [2006] OJ L114/9 (Waste Framework Directive); and Regulation (EC) No 1013/2006 on shipments of waste, [2006] OJ L190/1.

The introduction of CCS in the EU also necessitated amendments to international conventions, namely, the Protocol to the Convention on the Prevention of

Marine Pollution by Dumping of Wastes and Other Matter 1972 (London Protocol) and the Annexes to the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention).

Further, the CCS Directive amends existing legislation in order to introduce the so-called “carbon capture readiness” requirement for new electricity generating power plants with a rate of 300 megawatt or more by requiring them to have sufficient space to retrofit CCS equipment. Directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants, [2001] OJ L309/1.

Storage of Carbon Dioxide

The CCS Directive provides each MS with the right to select and determine areas in its territory in which to permit the location of storage sites provided that there are no significant risks of leakage of CO₂ from proposed geological formations and no significant environmental or health risks. The main types of geological formations to be used as storage sites are depleted oil and gas fields (including depleted fields under the North Sea) and deep saline aquifers. Storage of CO₂ in the water column is prohibited.

An MS may issue two types of permits for storage facilities: exploration permits and storage permits.

Storage permits, which must be approved by the relevant competent authority and submitted by it to the European Commission for review, must include:

- the precise location of the storage site;
- requirements for the storage operation including the total quantity of CO₂ to be stored;
- requirements for the composition of the CO₂ stream and, if necessary, any further requirements for injection and storage;
- a monitoring plan, including requirements to update it;
- reporting requirements;
- a corrective measures plan, that is, a plan setting out approved measures to correct

significant irregularities and to close leakages to prevent or stop releases of CO₂ from the storage complex;

- conditions for closure;
- a provisional post-closure plan;
- provisions on changes, review, updating and withdrawal of the permit; and
- requirements to establish and maintain financial security for obligations under the permit including closure and post-closure requirements.

The operator of a storage site is liable for any global environmental damage arising from it. The EU ETS applies so that, if CO₂ leaks from the site, the operator must surrender the requisite number of allowances.

The operator is also liable for local environmental damage. The CCS Directive amended the Environmental Liability Directive (ELD) in respect to such damage. Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, [2004] OJ L143/56. If the operator's activities cause an imminent threat of, or actual, "environmental damage" as defined by the ELD, the operator is liable for its prevention or remediation, respectively. Environmental damage is damage above a specified threshold to water, protected species and natural habitats, and land. Such damage includes not only the remediation and restoration of the damaged natural resource, but also complementary and compensatory damage which is somewhat similar to natural resource damage under the Comprehensive Environmental Response, Compensation, and Liability Act and the Oil Pollution Act.

In addition, the operator is liable for any corrective measures that are required under the CCS Directive, that is, any measures necessary to correct significant irregularities or to close leakages so as to prevent or stop the release of CO₂ from a storage complex. If the operator fails to take the necessary corrective measures, the competent authority may take the measures itself and recover its costs by, among other things, drawing on the financial security posted by the operator. The domestic law of each MS applies to

bodily injury and property damage claims concerning CCS.

When injections of CO₂ have ceased at a storage site, the site has been sealed, other conditions of the permit have been complied with, and all available evidence indicates that the CO₂ will be permanently contained for the indefinite future, the operator may transfer the site to the relevant competent authority. The transfer must be accompanied by a financial contribution from the operator to the competent authority that includes, among other things, the anticipated cost of monitoring the site for 30 years.

Conclusion

The CCS Directive establishes the legal framework to enable the commercial deployment of CCS in the EU, considered by the European Commission to begin in approximately 2020. In the meantime, progress is continuing on up to 12 large scale CCS demonstration projects called for by the Council to be operational by 2015.

A major factor in the commercial deployment of CCS is the high cost of surrendering one ton of CO₂ compared to the cost of capturing, transporting and storing it. The cost of CCS currently far exceeds the cost of surrendering ETS allowances. This situation will change, however, as CCS enters the commercial phase.

Other issues that must be resolved include local opposition to CCS projects in some MS, such as Germany and the Netherlands, as well as the complexity of the technology. For example, in May 2010, Norway, which is a leader in CCS (and which is not an MS), postponed a decision to finance a project to sequester CO₂ on an industrial scale in western Norway until 2014 because it was too complex to complete the project on schedule.

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