

# Energy Committees Newsletter

Vol. 5, No. 1

September 2007

## **CLIMATE CHANGE, THE USE OF FORCE, AND THE NUCLEAR POWER INDUSTRY**

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### **I. Introduction**

From the 1950s through the 1970s there was a pro-nuclear power consensus in the United States that resulted in the birth and vigorous growth of the nuclear power industry. Rising costs, construction delays, accidents, and waste disposal concerns shattered the pro-nuclear power consensus and stopped the growth of the industry in its tracks. It may now be time to rebuild that consensus and revive the growth of the nuclear power industry in the United States. In rebuilding that consensus, it might be appropriate to take into account in a meaningful way the broader foreign policy and international law benefits of a revived and robust nuclear power industry in the United States.

The purpose of this article is to suggest two such foreign policy and international law benefits to wide spread, new, nuclear plant construction in the United States that perhaps ought to be taken into measurable account in decision-making about revival of the nuclear power industry. Those benefits involve curing perceptions, right or wrong, in the international community of international law illegality involving the

United States and the emerging climate change regime and the use of force in Iraq.

The first perception is that the United States ignores the letter and spirit of the emerging international climate change regime to reduce greenhouse gas (GHG) emissions. *See generally*, GLOBAL CLIMATE CHANGE AND U.S. LAW (Michael B. Gerrard ed., 2007). The second growing perception is that the United States and its coalition partners invaded Iraq without discernable international law justification. Both perceptions of international law illegality directly reflect the current domestic growth energy policy of the United States that is anchored by a present and future reliance almost exclusively on fossil fuels (oil, coal, and natural gas), which both emit GHG and contribute to the dependence of the United States on foreign oil.

An aggressive revival of the U.S. nuclear power industry to replace fossil fuel-based electricity would put the United States in compliance with the climate change regime (whether or not the United States ever participates in it) and would help to reduce dependence on foreign sources of petroleum. Those benefits of removing perceptions of international law illegality ought to play a significant and positive role in weighing the benefits and costs of future domestic nuclear energy production.

### **II. Perceptions of International Law Illegality**

The first perception of international law illegality is that the United States is acting contrary to the letter and

**Energy Committees Newsletter  
Vol. 5, No. 1, September 2007**

**This newsletter is a cooperative effort of Energy and Natural Resources Litigation, Energy Facilities and Siting, Gas and Electricity Marketing, Hydro Power, International Energy and Resources Transactions, Petroleum Marketing, Global Oil and Gas Exploration and Production, Restructuring of the Electric Industry, and Renewable Energy and Resources Committees, and the Special Committee on Energy and Environmental Finance.**

**On behalf of the energy committees, James E. Hickey, Jr. was editor of this issue.**

***In this issue:***

Climate Change, the Use of Force, and the Nuclear Power Industry  
*James E. Hickey, Jr.* ..... 1

Supreme Court Gets Technical with the ESA  
*Tamar J. Cerafici* ..... 6

Commercial Truck Idling: Federal and State Laws Create Air Emissions and Energy Efficiency Challenges and Opportunities  
*Michael J. Allen* ..... 8

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spirit of the emerging international law regime to deal with climate change, in particular, efforts to reduce GHG emissions that contribute to global warming that are found in the 1992 United Nations Framework Convention on Climate Change (“Climate Change Convention”) (1771 U.N.T.S. 107) and later in the 1997 Kyoto Protocol to the Climate Change Convention (“Kyoto Protocol”). 37 I.L.M. 22. The United States is a party to the Climate Change Convention along with 188 other nations. [http://unfccc.int/parties\\_and\\_observers/parties/items/2352.php](http://unfccc.int/parties_and_observers/parties/items/2352.php).

The Climate Change Convention establishes an administrative mechanism for governments to cooperate in stabilizing and ultimately reducing man-made GHG emissions to stop global warming. It establishes a largely aspirational framework to address the problem of climate change by urging cooperation among nations, by calling for the gathering of data on GHG emissions, by the launching of strategies to facilitate needed financing and technologies, and by articulating principles (like equity, sustainable development, and the precautionary principle) to guide more substantive rules. An overall goal of the Climate Change Convention is to have developed nations reduce GHG emissions to their 1990 levels and to have them assist developing countries in dealing with GHG. While still a party to the Climate Change Convention, the United States, in 2001, withdrew from the Kyoto Protocol. <http://www.whitehouse.gov/news/releases/2001/06/20010611-2.html>. The Kyoto Protocol, which entered into force in February 2005 and has 169 parties to it, imposed binding international law obligations on industrialized nations to cap GHG emissions. If the United States had not withdrawn from the Kyoto Protocol, it would have been obligated to reduce its GHG emissions 7 percent below 1990 levels (Annex B to the Kyoto Protocol). Just the opposite happened. From 1990 through 2000, for example, total GHG emissions by the United States rose from 1,647 million metric tons annually to 1,885 million metric tons. Ronald E. Hagen et al., EIA Impact of U.S. Nuclear Generation on Greenhouse Gas Emissions. In 2005, GHG emissions from the United States were 17 percent higher than in 1990. EIA, Emissions of Greenhouse Gasses in the United States 2005. The United States alone produces roughly one

quarter of all the world's energy-related carbon emissions. Forty percent of that total comes from electric power plants burning coal, oil, and natural gas. In addition, the United States domestically has refused to regulate GHG emissions from automobiles under the Clean Air Act. *See Massachusetts v. EPA*, 127 S. Ct. 1438 (2007). By any measure, this is a domestic energy policy position out of step with the international law regimes emerging to deal with climate change and GHG emissions.

The second perception of illegality is that the invasion of Iraq was in significant measure about securing a foreign oil supply. Three considerations fuel that perception: the absence of an ironclad international law justification for the invasion, the presence of large oil reserves in Iraq, and the growing dependence of the United States on foreign oil for most of its oil needs.

There was little justification in international law for the invasion of Iraq by the United States and the coalition of willing states. The UN Charter and international law forbid "the threat or use of force by states against the territorial integrity or political independence of any state," except in an act of legitimate individual or collective self-defense or if authorized to maintain or restore international peace and security by the U.N. Security Council. *See* UN Charter Articles 2, 25, and 51. The invasion of Iraq was not an act of self-defense under either Article 51 of the U.N. Charter or under customary international law (*see* *Nicaragua v. U.S.* I.C.J. Reports 1984, p.342) because no armed attack occurred against the U.S. Iraq had not actually attacked anyone for twelve years prior to March 2003. The invasion also was not justified as an act of anticipatory self-defense, which does not require an actual armed attack, because Iraq neither had the capability nor demonstrated any intention of launching an imminent armed attack against the United States or other coalition states. The alternative notion that the invasion was legally justified in international law to preempt an armed attack at some remote point in time in the distant future is not a justification under international law for the use of force against the sovereign territory of another state. There is also no convincing record to support that Iraq had such long-term intentions. The invasion also could not be justified

in international law as an act of humanitarian intervention to stop an occurring mistreatment in 2003 of Iraqis by the Iraqi government in a way that shocks the conscience of the global community. *See* E.C. Stowell, *Intervention in International Law* 53 (1921). Finally, the invasion of Iraq was not legally justified by resolutions of the U.N. Security Council. The only three Security Council resolutions that could be invoked to justify the invasion were Resolutions 678, 687, and Resolution 1441. None of these resolutions authorized the invasion of Iraq in March 2003. Resolution 678 was over a dozen years old and only authorized force to oust Iraq from Kuwait in the Desert Storm war. Resolution 687, which governed the ceasefire that ended the Persian Gulf War, also did not authorize the use of force to enforce ceasefire terms. If the United States thought Resolutions 678 and 687 provided a legal predicate to invade Iraq in 2003, it would not have sought Resolution 1441 from the Security Council. Resolution 1441 did not authorize the use of force because it did not contain the "magic words" of authorization—"use all necessary means." Two permanent members of the Security Council (Russia and France) said in voting for 1441 both that they did not intend to authorize the use of force, and that the resolution itself clearly required the Security Council to take an additional decision if Iraq violated 1441. The Security Council subsequently never issued any resolution authorizing the use of force against Iraq.

In the absence of international law justifications for the invasion, the perception persists in some quarters, rightly or wrongly, that the United States invaded Iraq primarily to secure long-term foreign sources of oil. After all, the United States depends mostly on foreign oil for much of the country's energy needs. "In 2005, total U.S. demand for petroleum was 20.8 million barrels per day, of which 12.5 million barrels per day, or 60 percent, was from net imports." EIA Sheets Index: Petroleum Products Consumption. Domestic oil production is mature, is increasingly under environmental constraints, and is not expected to rise significantly in the future. Under the present growth energy policy of the United States, grounded in fossil fuel use, secure foreign sources of oil must be found. In this regard, Iraq is estimated to have up to 216 billion barrels of untapped oil reserves in the ground, the third

highest reserves in the world behind Saudi Arabia and Canada. EIA, Country Analysis Briefs: Iraq 2 (2006).

### III. Reviving the Nuclear Power Option

Nuclear power is one of the most readily available domestic energy sources that can be used to achieve energy independence. It has a fifty-year record of safe operational experience with over one hundred power plants. There are an estimated 498 million tons of uranium ore reserves in the United States to fuel a revived nuclear power industry (EIA, Estimation of Uranium Reserves). In addition, Australia and Canada, two close U.S. allies, have most of the world's uranium reserves. Unlike fossil fuel electric power, nuclear electric power does not produce any GHGs. In 2005, over 200 million barrels of oil were used directly for electric generation. EIA, Annual Energy Review 2005. This consumption can be replaced by nuclear generation, which would help to reduce U.S. foreign oil dependence. In addition, the heavy reliance on the automobile in the United States is a major source of both oil consumption and of GHG emissions. The movement to introduce electric and electric hybrid cars to the U.S. automobile market is an attempt to reduce oil use and GHG emissions. However, if electric batteries used in these cars are recharged with fossil fuel generated electricity, little is achieved to reduce GHG emissions because the source of those emissions is simply moved from the tailpipe to the smokestack. In a revived nuclear power industry, additional GHG emission reductions could be achieved by recharging electric car batteries with electricity produced from nuclear power plants.

Despite these advantages, the growth of the nuclear power industry has been moribund since the late 1970s because of domestic concerns about cost, accidents, and waste disposal. As a result, the nuclear energy contribution to meet the nation's total electric demand hovers at about 20 percent. If nothing changes in the calculus of the benefits and costs of nuclear power production, the contribution of nuclear energy to meet the rising energy needs of the United States will decline in the future. Existing nuclear plants are operating at top efficiency and they are near the end of their useful lives, with no new plants on the horizon. In turn, U.S. electric demand is expected to increase by 43 percent

over the next 20 years requiring between 1,300 and 1,900 new power plants. Remarks of Vice President Dick Cheney at the Annual Meeting of the Associated Press, Apr. 30, 2001. Without nuclear power plants, the primary fuel source for those plants will be fossil fuels (coal, natural gas, and oil), which are the major contributors of GHG to the atmosphere from electric generation. Renewable energy sources presently contribute little more than 2 percent of the nation's total electric generation, excluding hydroelectricity (i.e., wind, solar, geothermal). EIA, Electric Power Annual 2005, at 1, fig. ES1 (2006). Even if renewable capacity is trebled, it would still constitute only a very small portion of the total electric energy needs of the country. Hydroelectric power provides between 6 and 7 percent of the country's electricity. It is fully developed in the sense that nearly all rivers and streams capable of being used for production of hydroelectricity have been exploited. It is estimated that fossil fuels, without a change in energy laws and policies, will provide 86 percent of the energy supply of the United States in 2030. Electric Power Annual 2005 at 19, table 2.24 and at 20, table 2.5.

There is also in place a comprehensive legal and administrative regime for revival of the nuclear power industry. For example, the 1954 Atomic Energy Act allows private ownership of nuclear power plants under licenses issued by the federal Nuclear Regulatory Commission. The 1957 Price-Anderson Act limits investment risks and encourages investment in nuclear power plants by limiting the overall liability of commercial nuclear plant operators. The 1969 National Environmental Policy Act requires environmental impact statements to be prepared. The 1982 Nuclear Waste Policy Act addresses disposal of nuclear wastes associated with nuclear power production. The 1992 Energy Policy Act simplifies nuclear plant licensing procedures and encourages research and development of advanced nuclear power facilities. Finally, the 2005 Energy Policy Act renews the Price-Anderson Act, provides for loan guarantees for new nuclear power reactors, and establishes nuclear power production tax credits.

What then prevents a shift in domestic growth energy policy towards aggressive nuclear power development and away from reliance on fossil fuels? There are four

areas of concern about the nuclear power industry that inhibit its revival: costs, safety, proliferation, and waste that might merit reassessment. First, nuclear power remains at present relatively expensive under current financial comparisons. The cost of new nuclear plant construction per kilowatt hour is roughly \$1,500 compared to half that for a new coal plant. Marla E. Mansfield, *Prospects for nuclear generation*, TRENDS, ABA Section of Environment, Energy, and Resources, Nov/Dec. 2006, at 1. However, those cost comparisons do not fully internalize the global warming costs associated with GHG emissions from coal fired power production or the benefits of reducing GHG emissions by using nuclear power plants. The cost comparisons also do not reflect any of the benefits achieved by curing the perceptions of illegality with regard to the use of force or to global warming. Cost calculations could also be reduced on a short-term basis with government subsidies for the first few plants until economies of scale kick in with a revived nuclear industry, which would further reduce the cost per kilowatt hour.

Second, since the Three Mile Island accident in 1979 and the 1987 Chernobyl plant meltdown in the Ukraine, there are concerns about plant safety and harm from accidents. Since those accidents, many industry and government measures have been undertaken to improve safety margins at nuclear plants in the United States. In addition, nuclear plant technology has changed greatly and is continuing to change to produce safer plants. In any event, the old Chernobyl-type technology has never been used in the United States. There is also a new concern about the possibility of terrorist strikes against nuclear power plants and those safety concerns must be taken into consideration. In weighting safety concerns, it must be appreciated that global warming from GHG emissions can potentially produce far more catastrophic harms to the planet than local significant releases of radiation from a nuclear plant accident or terrorist strike for that matter.

Third, there are concerns about nuclear weapons proliferation resulting from the conversion of nuclear power plant fuel into nuclear weapons. However, proliferation of weapons from nuclear power plants is

not a problem inside the United States. It is a problem abroad in countries like Iran and North Korea.

Fourth, there are legitimate concerns about disposal and storage of nuclear waste. Throughout the fuel cycle, low-level and high-level radioactive waste is created. Of particular concern is spent nuclear fuel from fuel rods that can no longer produce enough heat to make electricity. Those highly radioactive spent fuel rods require storage permanently and safely to prevent exposure to humans, animals and flora and fauna. The waste disposal problem can be significantly ameliorated if the United States would lift its 1977 ban on nuclear fuel reprocessing, which would allow spent fuel rods to be used again rather than stored.

#### IV. Conclusion

Not presently taken into account in considering the revival of the nuclear power industry are the substantial and real benefits that a robust nuclear power industry plays in curing perceptions of international law illegality that have arisen in the context of climate change and the use of force. These benefits are admittedly hard to quantify. However, they arguably belong firmly in the decision making calculus about reviving the nuclear power industry in the United States.

*This article is drawn largely from the article: James E. Hickey, Jr., Reviving the Nuclear Power Option in the United States: Using Domestic Energy Law to Cure Two Perceptions of International Law Illegality, 35 HOFSTRAL. REV. 405 (2006).*

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The Special Committee on Restructuring of the Electric Industry has received full committee status and will now be known as the **Restructuring of the Electric Industry Committee.**

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## SUPREME COURT GETS TECHNICAL WITH THE ESA

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In a case of dueling “shalls,” the Supreme Court may have opened debate on federal agencies’ obligation to protect and account for the impact of their decisions on endangered species. In *Nat’l. Association of Homebuilders v. Defenders of Wildlife*, No. 06-340, 2007 WL 1801745 (June 25, 2007), <http://www.supremecourtus.gov/opinions/06pdf/06-340.pdf>, the narrow majority concluded that the Environmental Protection Agency (EPA) had a mandatory obligation under Section 402(b) of the Clean Water Act (CWA) to transfer permitting authority to Arizona because Arizona met specific criteria in the CWA. This obligation may conflict with the agency’s corresponding duty not to allow its decisions to jeopardize endangered species under Section 7(a)(2) of the Endangered Species Act (ESA), but the Court concluded that EPA had no obligation to consult under the ESA because EPA’s obligation to transfer authority under the CWA was not “discretionary.”

Justice Alito, writing for the majority, focused his review on the nine criteria that states must meet before EPA can properly transfer authority to issue wastewater discharge permits under the National Pollutant Discharge Elimination System (NPDES). Once a state meets these criteria, EPA “‘shall approve’ a transfer application unless it determines that the state lacks adequate authority to perform the nine functions specified in [33 U.S.C § 1342(b)].” 2007 WL 1801745 at \*8. EPA, as a result, does not have the discretion to deny a state’s application for transfer authority if the state meets the requirements of section 402(b). *Id.*

### **Mandatory Consultation “Discretionary?”**

Like Section 402(b), Section 7(a)(2) of the ESA is mandatory: “[e]ach Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or

carried out by such agency . . . is not likely to jeopardize endangered or threatened species or their habitats.” Justice Alito concluded that this obligation is limited to actions in which EPA has enough discretion to “insure” no jeopardy to endangered species; when the EPA’s “action” is approving a state’s NPDES program, application of the ESA’s mandate would effectively add an impermissible “10th criterion” to the CWA’s transfer authority. Thus, the duty under the ESA would impliedly repeal Section 402(b) and expand the state’s obligations.

Justice Alito looked to the Fish and Wildlife Service (FWS) regulations providing that the Section 7 requirement applies to “all actions in which there is discretionary Federal involvement or control.” 50 C.F.R. § 402.03. The ESA’s requirements “come into play” only when the action results from the exercise of agency discretion. Thus, an agency’s obligation to “insure” that its actions do not jeopardize endangered species is not triggered when an agency is required to do something by statute. “In short,” wrote Justice Alito, Section “7(a)(2)’s no-jeopardy duty covers only discretionary agency actions and does not attach to actions (like the NPDES permitting transfer authorization) that an agency is required by statute to undertake once certain specified triggering events have occurred.” 2007 WL 1801745 at \*14.

### **Whither *TVA v. Hill*?**

In a vigorous dissent, Justice Stevens asserted that the landmark snail darter case, *TVA v. Hill*, 437 U.S. 153 (1978), gave endangered species priority over all federal agency “missions.” He reiterated many of *Hill*’s conclusions—these principles, he claimed, had been ignored by the majority in favor of a wholesale limitation on the ESA’s authority. Despite clear Congressional authority, the majority’s conclusions allow federal agencies to limit ESA review to “discretionary” activities, without fully considering the impact of their “mandated” missions on endangered species. As a result, the settled doctrines in *Hill* are virtually—and improperly—overturned.

The majority may be said to have limited *Hill* to its facts: the regulations limiting the no-jeopardy consultations to “discretionary” actions were

promulgated nearly 10 years after *Hill*; the construction project was “discretionary; and the *Hill* Court ultimately concluded that Congress did not “mandate that the TVA put the dam into operation; there was no statutory command to that effect; and there was therefore no basis for contending that applying the ESA’s no-jeopardy requirement would implicitly repeal another affirmative congressional directive.” 2007 WL 1801745 at \*12.

### **Potential Impact**

Readers of this case should recognize that the Court attempted to focus on Arizona’s application, and EPA’s transfer of permitting authority. During the appeals period, EPA also granted permitting authority to Alaska. There, the agency requested an opinion from FWS and National Marine Fisheries Service that the no-jeopardy analysis did not apply. *Id.* at \*13, n.5. The Court concluded from the Alaska proceeding that EPA and the ESA agencies meant to limit the no-jeopardy review in Arizona as well, since they “clarified” their positions going forward. *Id.*

The results of the decision may be limited to the exercise of EPA’s power to transfer permitting authority to states. But the majority has offered an opinion that also has sweeping implications for the ESA, and the regulations promulgated to implement it. The Court has modified the doctrines established in *TVA v. Hill*, and limited federal obligations to take endangered species and habitats into account in the decision-making process. On the other hand, developers and other entities that may see the opinion as a boon to their projects would be well-advised to appreciate the unmentioned reality of the post-*Hill* world: states have their own lists of endangered species and critical habitat. Moreover, most federal agency actions involve sufficient discretion to allow an agency to “insure” no jeopardy to endangered species, and so the ESA would apply. Clearly, the ambiguities swirling around the protection of endangered species still remain, and the Court’s decision does little more than muddy the waters. Rather than settle law, it invites more difficult ESA disputes and litigation.

## **AMERICAN BAR ASSOCIATION SECTION OF ENVIRONMENT, ENERGY, AND RESOURCES**

### ***Calendar of Section Events***

#### **15th Section Fall Meeting**

Sept. 26-29, 2007  
Pittsburgh

#### **The Basic Practice Series**

Sept. 28-29, 2007  
Pittsburgh

#### **22nd Annual Petroleum Marketing Roundtable (PMPA)**

Oct. 10, 2007  
Phoenix

#### **ABA Midyear Meeting**

Feb. 6-12, 2008  
Los Angeles

#### **26th Annual Water Law Conference**

Feb. 21-22, 2008  
San Diego

#### **37th Annual Conference on Environmental Law**

March 13-16, 2008  
Keystone, Colorado

#### **Eastern Water Resources**

May 1-2, 2008  
Charlotte, North Carolina

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## COMMERCIAL TRUCK IDLING: FEDERAL AND STATE LAWS CREATE AIR EMISSIONS AND ENERGY EFFICIENCY CHALLENGES AND OPPORTUNITIES

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**Size and Nature of the Problem.** Each year, idling of commercial truck engines consumes billions of gallons of gasoline and diesel fuel. The exact amount of fuel consumed by idling is not known, but a recent analysis performed by Argonne National Laboratory, using conservative assumptions, estimated the amount of fuel consumed by workday and overnight long duration commercial truck idling may exceed three billion gallons a year. *See, Estimation of Fuel Use by Idling Commercial Trucks, Argonne National Laboratory, page 17: <http://www.transportation.anl.gov/pdfs/TA/374.pdf>.* The greatest share of fuel consumed by truck idling comes from Class 8 Vehicles, trucks with a gross vehicle weight of 33,000 lbs or more. *Id.* at 4. Class 8 trucks include the long haul trucks (many equipped with sleeper cabs) that are commonly referred to as semi-trailers.

Idling does not merely consume enormous amounts of fuel; it also generates large amounts of air pollution. The U.S. Environmental Protection Agency's (EPA's) Smartway Transportation Partnership Eeb site indicates that long duration truck and locomotive engine idling produces annual air emissions of 11 million tons of carbon dioxide, 200,000 tons of oxides of nitrogen, and 5,000 tons of particulate matter. See <http://www.epa.gov/smartway/idling.htm>.

There is also concern that increased air pollutant concentrations caused by idling trucks may be harmful to the health of their occupants and occupants of vehicles parked nearby. A recent EPA-funded study of air pollution inside and outside trucks idling at a large truck stop indicated that in-cab fine particulate matter concentrations and nitrogen dioxide concentrations were higher than some EPA ambient air quality standards. A second study indicated that PM<sub>2.5</sub> concentrations measured at a truck stop near a federal

highway interchange not only often exceeded the National Ambient Air Quality Standards, but were highest at night, suggesting that the emissions came primarily from idling truck engines, rather than the busier daytime traffic. *See Miller, et al, Diesel Truck Idling Emissions: Measurements at PM<sub>2.5</sub> Hot Spot, Paper No. 2609 (presented at the Transportation Research Board 2007 Annual Meeting), Air Quality Measurements Inside Diesel Truck Cabs (2005), and Measuring Air Pollution Inside and Outside of Diesel Truck Cabs (2005), <http://www.epa.gov/smartway/documents/incabairquality-110405.pdf>.*

Finally, truck idling consumes a significant portion of a truck engine's operating life, leading to increased maintenance and engine rebuild expense. Many large trucking companies offer their drivers financial incentives to keep the number of idling hours below certain thresholds, such as 30 percent of the total hours the engine is operating. The problem of truck idling is well known in the trucking industry but despite its enormous impact has only recently begun to receive attention in the mainstream media, *See, e.g., Call of the Truck Stop: Gentlemen Stop Your Engines, N.Y. TIMES, Mar. 7, 2007.*

**Why So Much Idling?** For many long haul truck drivers, their truck is their second home. They are on the road for weeks at a time, essentially living out of the truck's sleeper cab when they are not driving. The primary reason long haul trucks idle is to provide truck drivers climate control comfort by running the truck's HVAC systems during cold and hot weather conditions. Another important reason is so that truckers can provide electricity to a growing array of appliances in their vehicles, including refrigerators, televisions, and microwave ovens.

In addition, long haul truckers spend a good deal of time waiting—waiting to make deliveries, waiting at border crossings, and waiting to pick up loads for delivery. Last, but not least, truck drivers spend significant periods of time waiting to satisfy the safety-related requirements of the federal Hours-of-Service regulations of the Federal Motor Carrier Safety Administration, 49 C.F.R. Part 395. These rules establish maximum limits on the number of consecutive

hours that Commercial Motor Vehicle drivers may drive and mandate minimum length rest periods.

Workday truck idling also appears to be more prevalent than previously realized. A very large number of vehicles, including not only long haul trucks, but also utility service vehicles, ambulances, police vehicles, and many other types of vehicles require the ability to provide electric power for extended periods of time while they are stationary. For the overwhelming majority of these vehicles, engine idling keeps this power flowing. The number of idling hours per vehicle is not as large as the idling hours of each long haul truck that idles overnight, but the collective impact is very large, perhaps several times the impact of overnight truck idling.

**State & Local Regulations.** The air emissions impact of truck idling is significant enough that a growing body of state and local regulations now place limits on truck idling. As of December, 2006, part or all of twenty different states and the District of Columbia had in place some form or another of idling regulation. *See* Compendium of Idling Regulations compiled by the American Transportation Research Institute, on the Web at [http://www.atri-online.org/research/idling/Truck\\_Idling\\_Regulations.htm](http://www.atri-online.org/research/idling/Truck_Idling_Regulations.htm). While these laws are local in scope, their cumulative effect has been to create a network of jurisdictions that a long-haul trucker is increasingly likely to have to pass through in order to bring goods to market. State and local anti-idling laws typically limit the time that a truck may idle and impose civil and criminal fines for non-compliance. While fines for first offenses are typically small, several jurisdictions authorize the levying of fines as large as \$25,000 to \$50,000, plus the prospect of prison time.

Perhaps the most noteworthy of these state and local laws in their impact are the anti-idling regulations of the California Air Resources Board (CARB). The CARB anti-idling rules, found in Title 13 of the California Code of Regulations, are comprehensive in their scope and detailed in their application. They apply to drivers of diesel-fueled commercial vehicles with a gross vehicle weight rating of more than 10,000 pounds when they are operating in California, even if their vehicles are not based in California.

The CARB anti-idling rules currently impose a 5-minute idling limit at any location, with limited exceptions, including when “idling of the primary diesel engine is necessary to power a heater, air conditioner, or any ancillary equipment during sleeping or resting in a sleeper berth.” Title 13, California Code of Regulations. Section 2485(d). Within 100 feet of a “restricted area” which “means any real property zoned for individual or multifamily housing units that has one or more such units on it,” Title 13, California Code of Regulations. Section 2485(h)(16), the regulations are even tighter, and even limit the operation of diesel fueled auxiliary power systems (i.e., a reduced-sized diesel generator that functions as an idle reduction solution) to 5 minutes.

Effective Jan. 1, 2008, the CARB anti-idling rules will become significantly stricter. First, the exemption for trucks with sleeper cabs will disappear and they will be subject to the 5 minute idling limit. Second, diesel fueled auxiliary power systems for trucks with 2007 and newer engines must be California-certified to be permitted to continue to be used as idle reduction solutions. Third, all 2008 and subsequent model-year heavy-duty diesel engines must either be equipped with a non-programmable automatic engine shutdown system that shuts the idling engine down after a minimum period of time or must be certified to a NO<sub>x</sub> idling emission standard of 30 grams per hour. Fourth, fuel-fired heaters operated on trucks with 2007 or newer engines must meet emission standards specified in California’s Low Emission Vehicle Program (LEV II program). Heavy duty diesel engines in certain vehicles, including school buses, recreational vehicles, and military tactical vehicles will be exempt from these new requirements. Title 13, California Code of Regulations. Section 1956.8(a)(6).

**Technology Options Offer Road to Legal Compliance and Energy Efficiency.** To enable trucks to comply with state and local idling restrictions and to mitigate the economic impact of the fuel consumed and engine wear that results from excessive idling, a vibrant idle reduction industry has recently emerged. Technology options that are commercially available include:

- **Auxiliary Power Units (APUs).** An APU is a reduced-size diesel generator that substitutes for the truck’s main engine in powering the truck’s heating and cooling systems and electrical appliances. APUs use far less fuel than the engines for which they substitute.
- **Truck Stop Electrification.** Truck stop electrification enables a truck equipped with on board power infrastructure to “plug in” to the electrical grid to provide the necessary electric power for the truck’s heating and cooling systems and electrical appliances. To date, a limited number of truck and rest stops offer this option.
- **Battery Powered/Hybrid Systems.** These solutions capture energy generated while the truck is in motion and use it to charge a bank of high-performance batteries so it is available to power the necessary systems and appliances when the truck is stopped.
- **Thermal Energy Storage Solutions.** Thermal energy storage systems store cooling energy from the vehicle’s air conditioning system while the vehicle is in operation. The stored energy can be used at a later time for cab or sleeper berth cooling during periods of rest. Such systems only provide cooling, but can be paired with a fuel-fired heater for a complete heating and cooling package.

Factors evaluated by truck owners in choosing among the growing array of idle reduction solutions are performance, up-front cost, maintenance expense, and weight. For the time being, idle-reduction systems are after-market systems installed on trucks after their manufacture. However, it is likely that in the not too distant future, idle elimination systems will be built in to new vehicles from the factory.

**State Idle-Reduction Incentive Programs.** While idle reduction systems are very cost effective in terms of payback periods, many small truck fleet owners and operators lack ready access to the capital it takes to retrofit their vehicles. To address this concern and

promote better idling practices, a growing number of state programs provide grant funds or financing to assist truck owners and operators in retrofitting their trucks to comply with applicable laws.

An example of a typical such program is the Wisconsin Diesel Truck Idling Grant Program. This program provides \$1,000,000 of annual grant funding to Wisconsin-based truck owners that is used to pay up to 70 percent of the cost of purchase and installation of idle reduction systems. The number of vehicles eligible for grant funding depends upon the size of the fleet. The program requires that successful applicants report their post-installation results. Applicants who seek funding for more than a single idle reduction unit are required to utilize more than a single make and type of idle-reduction systems. These requirements will enable the funding agency, the Wisconsin Department of Commerce, to develop a performance baseline for various idle reduction solutions.

Three good sources of information for persons interested in learning more about idle reduction laws and grant programs, are the West Coast Collaborative Web site (for a list with links to the current programs, see <http://www.westcoastdiesel.org/programs.htm>), the American Transportation Research Institute Web site, <http://www.atri-online.org/>, and the U.S. Department of Energy’s “National Idling Reduction Network News” newsletter, [http://www1.eere.energy.gov/vehiclesandfuels/resources/fcvt\\_national\\_idling.html](http://www1.eere.energy.gov/vehiclesandfuels/resources/fcvt_national_idling.html).

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