Section 3

Government Actions Affecting Idling Reduction Efforts

3.1 Introduction

Freight-carrying vehicles and buses often idle for long periods of time for a variety of reasons, including the need to generate power to keep cargoes at required temperatures, maintenance of driver comfort during rest stops (including sleep stops), avoidance of fuel and engine problems when exterior temperatures are very low, and maintenance of passenger compartment temperatures to avoid discomfort when passengers board. There are clear private incentives to reduce such idling -- the monetary savings that would be obtained – from reduced fuel use and engine maintenance costs –and the reduced impact of exhaust pollution on the drivers, especially in rest areas or parking locations where multiple vehicles are idling at the same time. Balancing these incentives are the current high costs of idling reduction technologies such as onboard APUs and truck stop electrification. The existing net balance of private incentives and costs has not led to a strong market for idling reduction measures.

Because vehicle idling creates public as well as private costs, e.g. noise and pollution, local, State, and federal governments have their own incentives to wish for a reduction in vehicle idling. In the U.S., all levels of government have taken action – in the form of regulations, demonstration programs, and a variety of incentives – to achieve such a reduction, though these actions are limited. This section describes the incentives that drive the different levels of government and the types of actions they have taken. It also briefly describes the new Hours of Service requirements for long-distance truckers, which will affect the level of truck idling even though the purpose of the requirements is far afield from idling. It ends with a brief discussion of some additional policy measures that may be worth considering.

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3.2 What Drives Government's Idle Reduction Efforts

Efforts aimed at reducing unnecessary vehicle idling are conducted at all levels of government, although each level may not focus on the same issues. However, all levels are concerned about the potential harmful effects of diesel particulate emissions (and general exhaust emissions) on human health. The California Air Resources Board designation of particulate emissions from diesel-fueled engines as a toxic air contaminant (August 27, 1998) yielded a major increase in public and government interest in reducing diesel emissions. EPA statements about diesel exhaust have tended to lend support to the concerns raised by the California action:

- "There is enough evidence to indicate that inhalation exposure to diesel exhaust causes acute and chronic health effects."
- "There is considerable evidence that diesel exhaust is a likely carcinogen. Human epidemiological studies demonstrate an association between diesel exhaust exposure and increased lung cancer rates in occupational settings."[1]

[1] U.S. Environmental Protection Agency, "Air Toxics in New England: Diesel Particulate Matter," http://www.epa.gov/region1/eco/airtox/diesel.html.

Federal issues. Federal programs also focus on the oil use and greenhouse gas emission consequences of idling, as well as emissions of other criteria pollutants,[2] especially the ozone precursor NO_x. The National Energy Policy report of 2001 specifically recognized the importance of idling fuel consumption and emissions from long-haul trucks by recommending Federal action to reduce idling:

> The NEPD Group recommends that the President direct the EPA and DOT to develop ways to reduce demand for petroleum transportation fuels by working with the trucking industry to establish a program to reduce emissions and fuel consumption from long-haul trucks at truck stops by implementing alternatives to idling, such as electrification and auxiliary power units at truck stops along interstate highways. EPA and DOT will develop partnership agreements with trucking fleets, truck stops, and manufacturers of idle-reducing technologies (e.g. portable auxiliary packs, electrification) to install and use low emission-idling technologies.[3]

State issues. State programs are concerned primarily with the emissions and air quality consequences of vehicle idling. States have tended to focus on the NO_x emissions from idling because over 20 States are currently out of compliance with Federal ozone air quality standards. Failure to bring ozone air quality into compliance may eventually threaten States with the loss of a portion of their Highway Trust Fund allocation and limits on economic development in their non-complying counties, as described below. However, to place this in perspective, EPA has designated only 3 counties, all in California, in the "serious" or "severe" category (no counties received the designation of "extreme," which is the worst designation) for ozone pollution.[4]

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States in non-attainment of an air quality standard for a criteria pollutant must develop and implement State Implementation Plans (SIPs), which describe the series of actions to be taken to reduce emissions sufficiently to meet the standard. Section 179 of the Clean Air Act requires automatic sanctions if EPA disapproves a SIP, or if EPA finds that a SIP requirement is not being implemented.[5] After a SIP disapproval or non-compliance finding, States have 18 months to correct the problem or face an "offset sanction" – a requirement that owners of new or expanded facilities emitting the non-complying pollutant must reduce existing emissions of that pollutant by 2 tons for every 1 ton of emissions growth. This is a much more severe offset requirement than the requirement imposed on "non-sanctioned" nonattainment areas, of 1.1-1.5 to 1 offsets, and would threaten economic development in a sanctioned area. Further, if States do not fix the problem within the 18 month period, EPA then starts a 6 month clock that will, if the problem is still not fixed, yield a prohibition on Federal funds for transportation projects within the non-complying area, with exceptions for certain safety, transit, and air quality-related

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[2] Criteria pollutants are the six pollutants for which the Environmental Protection Agency has set National Ambient Air Quality Standards. The six are ozone, nitrogen oxides, particulate matter, sulfur dioxide, carbon monoxide, and lead.

[3] National Energy Policy Development Group, *National Energy Policy: Reliable, Affordable, and Environmentally Sound Energy for America's Future*, May 2001, http://www.whitehouse.gov/energy/National-Energy-Policy.pdf.

[4] U.S. Environmental Protection Agency, "8-Hour Ground-level Ozone Designations," http://www.epa.gov/ozonedesignations/regions/region1desig.htm and additional websites with the same address except for the region #.

[5] The sanction policy is described in more detail in http://www.fhwa.dot.gov/environment/sanction.htm.

projects. Finally, if EPA determines that the problem is caused by the actions of a State agency or by State government, it may impose wider sanctions, even Statewide; when a political subdivision is responsible for the failure to comply with the law, EPA must wait 2 years before expanding the sanctions beyond the subdivision.

EPA has imposed offset sanctions 18 times since 1990, but has started the process (giving States an 18 month deadline) over 800 times.[6] The highway funds sanctions have been applied only twice, to East Helena, Montana and Iron County, Missouri.[7] A recent analysis of the sanctions concludes that their threat is often effective in obtaining State action, and State officials themselves use the threat of sanctions to convince legislatures to act.[8]

Local issues. Local efforts to curb idling are responding to two primary concerns: noise pollution and the health impacts of particulate emissions. In addition, both EPA and State governments have pressured local governments to act to help reduce emissions in nonattainment areas.

3.3 Effect of the Revised Hours of Service Rule on Private Incentives to Curb Idling

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Another government action affecting idling, though indirectly, is the hours-of-service (HOS) regulations that govern the maximum amount of driving truck drivers can do and the minimum amount of rest they must get. In April, 2003, DOT's Federal Motor Carrier Safety Administration changed the HOS regulations. Under the old rules, *all* Commercial Motor Vehicle (CMV) drivers may not drive:

- More than 10 hours, following 8 hours off-duty
- After 15 hours on-duty, following 8 hours off-duty
- After 60/70 hours on-duty in 7/8 consecutive days
- The 15 hour workday can be extended with off-duty breaks

Under the new rules (effective January 4, 2004), *property carrying* CMV drivers may not drive:

- More than 11 hours, following 10 hours off-duty
- Beyond the 14th hour **after coming on-duty**, following 10 hours off-duty
- After 60/70 hours on-duty in 7/8 consecutive days. The language change from above means that the 14-hours period cannot routinely be extended by taking off-duty breaks during meals, refueling, rest stops, waiting time at the loading dock, etc.[9]
- Truck drivers may restart a 7/8 consecutive day period after taking 34 or more consecutive hours off-duty as long as the driver has not exceeded 60/70 hours on-duty.

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[6] McCarthy, J.E., *Highway Fund Sanctions and Conformity Under the Clean Air Act*, CRS Report for Congress, October 15, 1999, http://ncseonline.org/NLECRSreports/Transportation/trans-29.cfm.
[7] Ibid.
[8] Ibid.
[9] FleetOwner.Com, "Changing the Rules Changes the Game," Jan 1, 2004, http://fleetowner.com/ar/fleet_changing_rules_changes/index.htm.

- Under some limited circumstances, CMV drivers may extend their on-duty period to 16 hours; however, the 14-hour workday cannot be extended more than once every 7/8 day period.

Although there is substantial disagreement and uncertainty about precisely how the new rules will affect trucking operations, it seems most likely that three factors will affect the amount of idling that will occur:

1. The need for 10 hours off-duty and the limitation to a 14-hour period during which each cycle's driving can occur will more than offset the added allowable hour of driving "per cycle," adding to the total time required to drive long distance hauls, and adding to the total rest time during each trip – yielding increased idling time.
2. The inability to count waiting and unloading time to a driver's off-duty time to extend the driving day will create substantial pressure to shorten these times, e.g. by better coordination and appointments between shipper and receiver, better unloading procedures, and so forth. This should reduce "short time" idling time. Further, the inability to count this time may create problems for multi-stop loads, yielding some shifting to smaller trucks or adding some incentive to do part-hauls (shift from truckload, TL, to less than truckload, LTL) or even shifts in shorter hauls to multi-mode operations.
3. The added cost for long hauls, at least for single-driver trucks, may result in shifts to more 2-driver trucks (though such a shift is problematic due to shortages of qualified drivers) as well as some shifts to other modes. If there is substantial shifting, this may yield a reduction in idling.

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One certainty about the effect of the rules is that the impact on total trip time and idling time will be extremely variable, depending upon the characteristics of each job and upon driver and company responses to the rules.

Antares Group Incorporated has estimated the effect of the new rules on total idling time, although this estimate does not consider changes in loading and unloading operations, modal shares, or shifts between 1-driver and 2-driver operations that might occur as a result of the rules, and further focuses on an "average" driving schedule whose relationship to any statistical evaluation of industry driving schedules is unclear. With these limitations, Antares estimates an approximate increase in average idling time from 110 hours to 138 hours per 120 hours of on-duty operations, as well as a significant increase (25%) in the number of days required to make any long-distance trip.[10]

We are not prepared to estimate the net effect on idling time taking all the relevant factors into account, but do conclude that there is a strong chance that the average time spent at extended rest for an average long-distance trip will increase – yielding a significant added incentive to reduce idling at rest stops either through APUs or electrification.

3.4 State and Local Regulations Against Idling

[10] Antares Group Incorporated, "Implications of the Revised Hours-of-Service Rule on the Trucking Industry," USDOE Contract No. DE-AC01-98EE50496, March 2004.

A number of States and localities have regulations that limit vehicle idling, with most aimed at heavy-duty diesel vehicles. As of 2003, 13 States – Arizona, California, Connecticut, Hawaii, Massachusetts, Maryland, Minnesota, New Hampshire, New Jersey, Nevada, New York, Pennsylvania, and Virginia – have statewide regulations; 7 States have city or county regulations. These regulations are described in Appendix A. Five of the statewide regulations (Connecticut, Maryland, Massachusetts, New Jersey, and Virginia) and one local regulation (Houston/Galveston, Texas) listed in Appendix A are part of the State Implementation Plans, and thus are legally enforceable by both the State or locality and the federal Environmental Protection Agency. The remaining regulations can be enforced only by State and local agencies.

A few of the regulations (Arizona, New Jersey, and Utah) include exemptions for climate control for sleeping that basically eliminate the incentive for APUs or truck stop electrification.[11] A few others (Colorado, Connecticut, New York) allow exemptions for extremely cold weather, but these regulations still provide a substantial incentive for APUs or electrification.

We have little information on enforcement of these anti-idling regulations, but are aware that Boston and New York City have active enforcement programs and ongoing efforts to negotiate settlements with operators of facilities that have intensive truck traffic and idling problems. For example, the State Attorney General's office in New York has negotiated an agreement with the wholesale meat market in Hunts Point in the Bronx that requires the market itself to enforce New York City's 3-minute truck idling limit, report violations, and allow trucks from the adjacent wholesale produce market to use its truck stop electrification bays without paying an additional entry fee. The agreement is one of 12 that the Attorney General has negotiated since 2002, including the Hunts Point produce market, Frito-Lay, and two tour bus lines.[12]

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EPA's regional offices can play an important role in enforcement of these regulations if the regulations are in the State Implementation Plans. For example, EPA's New England regional office has taken an active enforcement role in Massachusetts, citing bus operators at Logan Airport and the Massachusetts Bay Transit Authority in Boston for excessive idling at its bus yards.[13]

Some of the regulations are quite limited in scope, for example, limitations on idling from trucks waiting to load and unload at ports. California passed H&S 40720 in 2002, demanding that each marine terminal in the State not cause engines on trucks waiting at the gate to idle for more than 30 minutes, with penalties assessed against the terminal owner.[14] The legislation has safeguards against such practices as diverting idling trucks to area freeways or alternative staging areas, or asking the truck drivers to turn their engines on and off. Basically, the legislation is

[11] Maryland has an exemption "when necessary to accomplish the intended use of the vehicle" that possibly may yield the same result, depending on interpretation of this language.
[12] Egbert, B., "Deal Clears the Air on Idling Trucks," New York Daily News, March 30, 2004.
[13] U.S. EPA Region 1 Notice of Enforcement Actions, http://www.epa.gov/ne/eco/diesel/enforcement.htl.
[14] Currently this is California's only idling reduction regulation. However, the State appears to be moving towards a more general rule limiting truck idling to 5 minutes.

aimed at getting terminals to arrange appointments and otherwise change their operating practices to avoid long queues. New Jersey, Washington, and Massachusetts have since adopted essentially identical regulations.

Finally, California has recently (July, 2003) adopted an idling control measure specifically aimed at schools, demanding that school buses and other heavy-duty vehicles turn their engines off within a short time when stopped close to schools. Three New England states, Connecticut, Maine, and New Hampshire, have adopted more limited measures, signing anti-idling agreements with their School Transportation Associations and developing outreach materials to educate school bus drivers and school officials. And there may well be additional local regulations concerning school buses and truck idling within school zones that were not identified in the survey that led to Appendix A.

3.5 Idling Reduction Programs in State Implementation Plans

Aside from anti-idling regulations, States and localities can develop Voluntary Measures to move idling reduction technologies into Class 8 trucks as part of their State Implementation Plans and transportation conformity determinations. Similar measures can be developed for switch yard locomotives. EPA has developed guidance documents that describe how such programs must be structured, and how emission reductions (for NO_x, $PM_{2.5}$, and PM_{10}) can be quantified.[15] Specifically, the States need to make "enforceable SIP commitments to monitor, assess, and report on the emissions reductions resulting from the voluntary measures and to remedy any shortfalls from forecasted emission reductions in a timely manner."[16] For use of APUs, trucks in the program must be equipped with global positioning systems or similar methods for proving that they are actually in the SIP areas during the time when the emissions reductions are claimed. The guidance documents provide a detailed methodology to quantify the magnitude of the emissions reductions that can be claimed, based on data on historic idling activity, emission factors for the pollutants, and details about the technologies and their use.

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Some concerns have been raised about the difficulty of complying with the EPA SIP requirements on truck idling reduction measures, especially the extensive data requirements, including historical data for predicting future emissions.

3.6 Pending Federal Legislation on Vehicle Idling

The Energy Policy Act of 2003 (which has seen several iterations and, at the time of writing is being substantially revised) has included language aimed at dealing with heavy-duty vehicle idling. The following actions have been included in various iterations of the bill:

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[15] U.S. Environmental Protection Agency, Office of Transportation and Air Quality, *Guidance for Quantifying and Using Long Duration Truck Idling Emission Reductions in State Implementation Plans and Transportation Conformity*, EPA420-B-04-001, January 2004; and *Guidance for Quantifying and Using Long Duration Switch Yard Locomotive Idling Emission Reductions in State Implementation Plans and Transportation Conformity*, EPA420-B-04-002, January 2004.

[16] Ibid.

The first item calls for a study by the Secretary of Energy, in consultation with the Secretary of Transportation, to "analyze the potential fuel savings resulting from long duration idling of main drive engines in heavy-duty vehicles ('long duration idling' is defined as idling of more than 15 minutes, except when due to traffic congestion)."[17]

Second, after the study is completed, the Secretary may issue regulations requiring the installation of idle reduction systems on all new heavy-duty vehicles.

Third, the EPA Administrator is required to review the computer models used to estimate total emissions from mobile sources to determine whether they accurately reflect emissions caused by long-duration idling, and to establish a program, in consultation with the Secretary of Transportation, to support the use of idle reduction technology.

Fourth, the Secretary of Transportation, consulting with the EPA Administrator (or vice-versa in another version), is asked to conduct a study to evaluate all rest areas for heavy-duty vehicles.

In addition to the Energy Policy Act, the pending Safe, Accountable, Flexible, and Efficient Transportation Equity Act (SAFETEA) , the transportation funding authorization act, contains language to exempt TSE services from an existing prohibition on commercial establishments along interstates (see below).

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3.7 State and Federal Programs and Incentives for Idling Reduction

A variety of Federal and State programs are available to promote the use of idling reduction technologies.

A currently available Federal (Department of Transportation) funding source for idling reduction programs is the Congestion Mitigation and Air Quality Improvement (CMAQ) program, which is aimed at achieving emission reductions "within, or in close proximity to and primarily benefiting a(n air quality) nonattainment or maintenance area."[18] The project must come from a conforming transportation plan and Transportation Improvement Program, with at least a 20 percent funding match. Projects can include both truck stop electrification (TSE) and on-board idle-reduction technologies. On-board technologies are eligible if there is some assurance that the vehicle's range of operation will be predominantly in the nonattainment or maintenance area. By contrast, truck-stop electrification programs within nonattainment and maintenance areas can be eligible regardless of where the trucks operate if an air quality benefit is demonstrated. Currently, CMAQ funds are not eligible for supporting installation of onboard devices on locomotives, because there is no mechanism to provide emission reduction credits from non-road projects, for SIP and conformity purposes, in the on-road emission inventory.

[17] This item may appear somewhat redundant, because this report and others have already addressed this issue in some detail.
[18] Federal Highway Administration Memorandum CMAQ Eligibility for Idle-Reduction Measures, http://www.fhwa.dot.gov/environment/cmaqpgs/tsemem.htm.

DOT and EPA are working to develop a method to do this, however. Another important limitation of this program is that, under current law, rest areas on interstate highways cannot contain commercial establishments (except for vending machines, newspaper racks, and phones), so electrification projects would be limited to rest areas and truck stops located off the interstates. To date, CMAQ has funded idle-reduction projects in several States, and there are numerous pending applications for future funding.

The Environmental Protection Agency has established a SmartWay Transport Partnership[19] as a collaborative voluntary program between EPA and the freight industry, with reduction of long duration engine idling as a key strategy. In 2002, EPA issued a request for applications for a Green Transport Initiative, demonstration projects to reduce long-duration idling from trucks and locomotives, aimed at national, non-profit organizations actively involved with transportation and/or air quality issues and already engaged in partnerships with trucking or locomotive private companies aimed at reducing transportation-related environmental impacts. The request mentioned the availability of up to $200,000 per organization in financial assistance.[20] In July, 2004, EPA launched the National Transportation Idle Free Corridors project as part of the SmartWay Partnership, aimed at deploying stationary truck idling reduction projects (i.e., truck stop electrification) along heavily traveled transportation corridors within areas of poor air quality. In April, 2004, EPA asked for initial proposals for TSE projects to be awarded to State, local, multi-State, and tribal government agencies, universities, and non-profit organizations, with total funding of an estimated $800,000 and an anticipated four to eight cooperative agreements.

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The Department of Energy is leading a 21st Century Truck Partnership that combines research and development with education and incentive programs to improve the efficiency of trucks – including a special strategic program aimed at reducing fuel use and emissions from idling engines by at least two-thirds from 2002 levels by 2017. The explicit objectives of this part of the Partnership are:

- Establish an integrated and comprehensive industry/government partnership for reducing fuel use and emissions due to idling;
- Develop and demonstrate an advanced 5 kW APU that weights 200 pounds, consumes 0.25 gal/h of diesel fuel or less at full load, meets Tier 2 Bin 10 emissions or lower, and can be purchased (in production volumes) for $400/kW (in 2002 dollars) by 2009;
- Develop and demonstrate commercially viable fuel cell APU systems in the 5-30 kW range capable of operating on diesel fuel with 35% efficiency (based on the Lower Heating Value of diesel) at a delivered cost of $400/kW (in 2002 dollars) by 2015;
- Develop a mix of incentives and regulations to encourage trucks and buses to find other more fuel efficient and environmentally sustainable ways to provide for their power needs at rest;
- Develop consistent electrical codes and standards that apply to both on-board and stationary truck stop electrification technologies; and
- Establish an educational program for truck and bus owners and operators to implement enabling technologies and operational procedures to eliminate unnecessary idling.

[19] (http://www.epa.gov/otaq/smartway/)
[20] One $200,000 grant was awarded to the Electric Power Research Institute for outfitting trucks with onboard electric equipment, to allow the trucks to plug intoelectric outlets provided at some truck stops.

Two State-level programs providing incentives for idle reduction are the Carl Moyer Memorial Air Quality Standards Attainment Program in California and the Texas Emissions Reduction Plan (TERP).

The Carl Moyer Program, which is overseen by the California Air Resources Board, provides funds for installing clean engines and equipment designed to reduce emissions of NO_x, to help the State meet its SIP commitments and local air districts to their own commitments under the SIP. Carl Moyer grants are issued locally by air pollution control districts and air management districts, and Program funds require matching funds from the local districts. One focus of the Program has been the use of alternative idling reduction technologies, with a maximum grant of $1,500 for each diesel APU installed (a $2,500 subsidy is available for a high technology system such as a fuel cell APU). The primary requirement is that the technology be used within the state of California for a minimum of 100 hours per year for five years. Two new projects being considered at the time of this writing are grants to install idle limit devices, either aftermarket or OEM, and electrification of truck stops.

The TERP program issues grants for activities "that reduce emissions of NO_x from high-emitting diesel sources in eligible areas.[21]" The program has asked for grant applications for the following idle reduction measures:

- On-site electrification and idle reduction infrastructure
- On-vehicle electrification, to accept electricity from external sources
- Installation of on-vehicle APUs

Although the program seems aimed primarily at heavy-duty trucks and heavy equipment, it will fund, on a case-by-case basis, idle reduction technology for locomotives as well.

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3.8 Potential Idling Reduction Policies

Aside from the idling reduction regulations and programs discussed above, a number of additional policies have been suggested.[22] These include:

- Elimination of the 12% excise tax on idle reduction technology (e.g., the ability to deduct the cost of the technology from the total truck price in calculating the tax);[23]
- Granting relief from maximum weight limits to heavy duty trucks by allowing deduction from the calculated GVW of the weight added by idling reduction technology (under current rules, for trucks whose payloads are weight-limited, addition of an APU will reduce allowable payload, creating a disincentive to installing idle reduction technology);

[21] Texas Commission on Environmental Quality, "Request for Applications, Grants for Projects to Reduce Emissions of Oxides of Nitrogen (NO_x) in the Texas Nonattainment and Near-Nonattainment Areas."
[22] From various sources, including a DOE-sponsored workshop "Idle Reduction Technologies for Heavy-Duty Trucks: Cost Reduction Workshop," Cincinnati, OH September, 2003.
[2323] The original draft of the SAFTEA legislation included this exemption, but as of January 2004 it had apparently been eliminated (source: letter of January 26, 2004 from Klaus Holze, TruckGen & Air Services, Inc. to Corrine Brown, U.S. Congress).

- Providing free or low-cost electricity for hotel loads at public truck rest facilities;
- Requiring idle reduction technology in Federal and State government fleets;
- Development of national standards for APUs and truck stop equipment;[24]
- Government-sponsored demonstration projects (in addition to the small projects noted above);
- Tax credits or deductions to truckers and/or manufacturers and/or truck stop providers for idle reduction equipment and infrastructure;
- SIP-based emissions credit trading by regulated industries for emissions reductions with truck stop providers (electrification) or trucking companies (if reductions in idling emissions are *not* part of the area's SIP plan);
- Education on damages of idling; availability of idling reduction technologies (including "buying guides" for technology); analysis of costs and benefits for truckers (initial cost, maintenance, reduced wear on engine, fuel savings); publicity campaigns aimed at truckers; and
- Development by EPA of more stringent emission regulations for APUs (to avoid emissions *increases* with APU use).

At this writing, action had been initiated on at least one of these policies. On Earth Day, April 22, 2004, Texas Congresswoman Kay Granger introduced legislation that would provide the nation's truckers federal income tax credits to purchase alternative power source devices. The "Idling Reduction Tax Credit Act of 2004" would allow a tax credit of up to $3,500 (up to 50% of the device's cost) for each truck outfitted with equipment described as "idling reduction devices."

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[24] The Trucking and Maintenance Council of the American Trucking Association (TMC/ATA) initiated the development of Recommended Practice standards for "Engine Off HVAC Performance Requirements for Truck Cabs with Sleepers," and "Cab & Sleeper Insulation Efficiency."