

IdleBox: What's in It for EPA Advance?

January 25, 2017

Patricia Weikersheimer and Linda Gaines, PhD
Argonne National Laboratory

What Is DOE's Clean Cities?

Clean Cities

advances the energy, economic, and environmental security of the United States by supporting local actions to cut petroleum use in transportation.

Reduced petroleum consumption

Reduced greenhouse gas (GHG) emissions

Reduced dependence on imported petroleum

Quick Refresher: What's Wrong with Idling?

- *Idling in the U.S. uses more than 6 billion gallons of fuel at a cost of more than \$20 billion each year.*
- Idling vehicles consume from 0.2 to 1+ gallons of fuel per hour.
- Idling vehicles emit and contribute to the formation of criteria pollutants.
- Each gallon of fuel burned produces about 20 pounds of carbon dioxide.
- Especially for heavy-duty trucks, idling increases vehicle maintenance costs and can shorten engine life.
- Idling may be against the law.



But . . . Idling Reduction Is More Complicated Than “Turn Off Your Engine”

- With passenger cars, the message may indeed be as simple “Turn the key.”
- With vehicles that need power for nonpropulsion purposes, it’s more complicated.
 - Vehicles that need power while stationary range from emergency vehicles to work trucks to long-haul, heavy-duty trucks.
 - The good news is that there are devices/technologies available that reduce or eliminate idling.
 - The ROI on these technologies will be a key factor in adoption and acceptance.

What's in IdleBox?

- Information cards, tip sheets, and pledge forms
- Outreach letters and press releases
- PowerPoint presentations
- Poster and sign
- Idling calculator
- IdleBase (a database of idling laws)
- Technical reference materials
- And more . . .



IdleBox Home Page: cleancities.energy.gov/idlebox

U.S. DEPARTMENT OF ENERGY Energy Efficiency & Renewable Energy

Clean Cities

IdleBox Toolkit for Idling Reduction Projects

IdleBox is an electronic education and outreach toolkit on vehicle idling reduction. The low-hanging fruit of fuel economy, idling reduction is a simple way to use less fuel and to reduce pollution and greenhouse gases.

What is idling?

Idling is running a vehicle's propulsion engine when the vehicle isn't moving. Idling wastes fuel and creates harmful emissions.

Use IdleBox to:

- Learn more about the benefits of idling reduction for your organization, fleet, or community.
- Engage and educate others—including drivers, fleet managers, policymakers, sustainability managers, and others—on the value of idling reduction.
- Launch an idling reduction campaign for your organization, fleet, or community.

Core Resources

Messaging Materials	Letters & Pledge Forms	Technical Resources
Fact Card	Outreach Letter	Idle Reduction Savings Calculator: Excel or PDF
Fact Card Templates	Press Release	Database of Idling Regulations
Tip Sheet	Organization Pledge Form	National Idling Reduction Network News
Stop Idling Graphic	Driver or Employee Pledge Form	
Stickers		
Sign Template		
Poster Template: 11" x 17" or 22" x 34"		

Specialty Resources

Personal Vehicles	Light- and Medium-Duty Fleet Vehicles
Idling Reduction for Personal Vehicles (Fact Sheet)	Idling Reduction Guide for Fleets (Presentation)
Which is Greener: Idle, or 'Stop and Restart'? Comparing Fuel Use and Emissions for Short Passenger-Car Stops (Fact Sheet)	Technology Solutions (Presentation)
Reducing Personal Vehicle Idling (Presentation)	
Stop and Restart Effects on Modern Vehicle Starting System Components—Longevity and Economic Factors (Technical Report)	

Heavy-Duty Vehicles	Emergency & Other Service Vehicles
Long-Haul Truck Idling Burns Up Profits (Fact Sheet)	Idling Reduction for Emergency and Other Service Vehicles (Fact Sheet)
Idling Reduction for Long-Haul, Heavy-Duty Trucks (Presentation)	Case Study—Idling Reduction Technologies for Emergency Service Vehicles (Technical Report)
Emissions From Idling Heavy-Duty Trucks and Idling-Reduction Equipment (Technical Report)	

Are You a Clean Cities Coordinator?

IdleBox has additional resources for Clean Cities coalitions. Go to the Coalition IdleBox Resources.

College students help conduct an IdleBox campaign at their home Middle School in Columbia, Missouri.

IdleBox has been a tremendous support to our mission with one school. We have provided a comprehensive kit with high-quality, ready-to-use information featuring IdleBox materials and EPA lesson plans that we present to schools to encourage and support their interest in decreasing idling reduction and air quality improvement programs. IdleBox has been a great resource for our coalition's educational outreach efforts.

Lauren Lambert-Funkhous, Louisville Clean Fuels

IdleBox has been a great set of tools for many of our projects. It has helped the IdleBox team serve as a foundation for our successful webinar on Driver Training. We were able to educate fleet managers and drivers in our region about the environmental and economic impacts of empty idling their day. We also used the tools available for a presentation given to Georgia State Police each staffed as part of the National Parks initiative with which we are involved.

Heather Crockett, Anel After-Clean Cities Coalition

- IdleBox is organized by **Core Resources** and **Specialty Resources**.

IdleBox Organization: Core Resources

Core Resources

Messaging Materials

Fact Card 

Fact Card Template 

Tip Sheet 

Stop Idling Graphic 

Stickers 

Sign Template 

Poster Template: 11" x
17"  or 22" x 34" 

Letters & Pledge Forms

Outreach Letter 

Press Release 

Organization Pledge
Form 

Driver or Employee
Pledge Form 

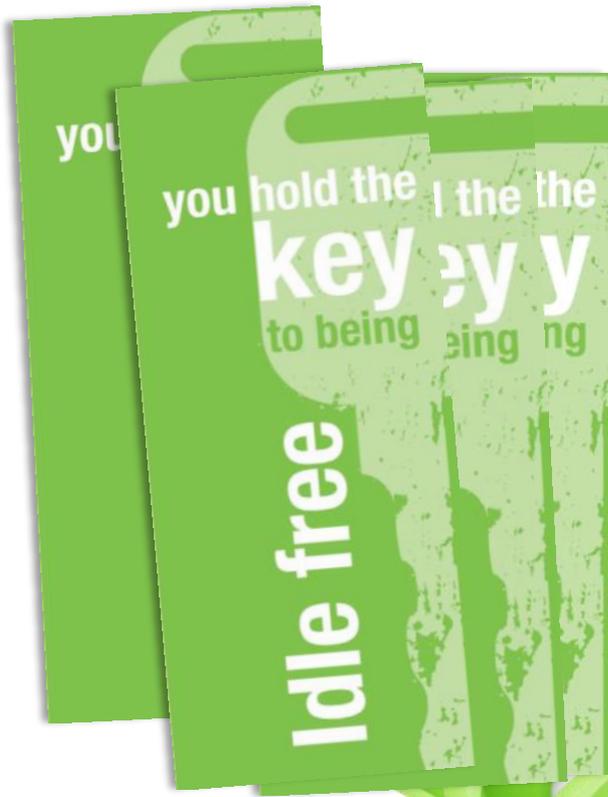
Technical Resources

Idle Reduction Savings
Calculator: Excel  or
PDF 

Database of Idling
Regulations 

National Idling
Reduction Network
News

Core Resources: Messaging Materials Examples

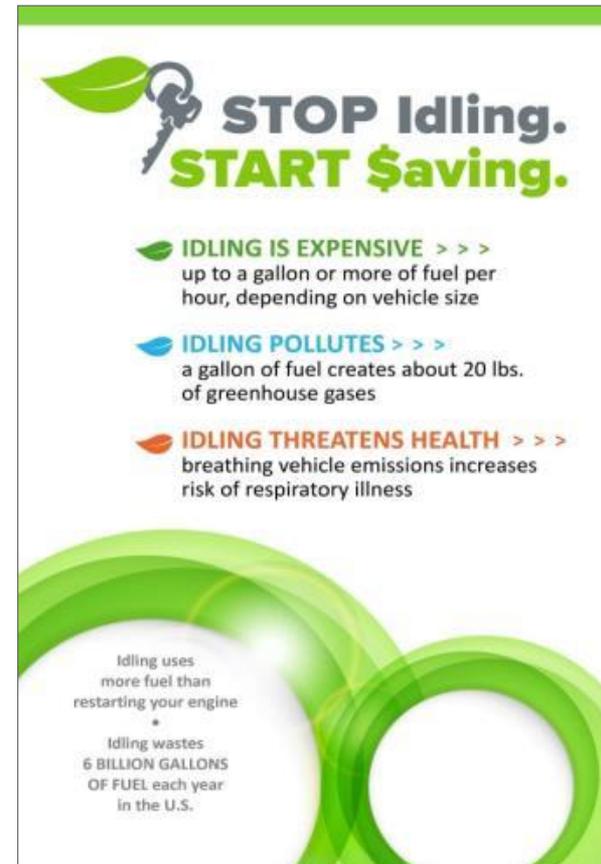


Core Resources: Messaging Materials Examples, cont.

- **Sign** for loading, unloading, and parking areas
- **Poster** for employee areas



▲ Sign



▲ Poster

Core Resources: Letter/Pledge Form Examples

**STOP Idling.
START Saving.**

Dear _____

In business, every dollar counts. Did you know that there are simple ways to reduce fuel costs with minimal or even no expense?

Reducing the time a vehicle idles is the simplest form of fuel economy; it can be easy to implement and often requires little or no financial investment.

Why Care About Idling?

- **Idling is expensive:** Idling may consume a gallon of fuel or more per hour, depending on the vehicle.
- **Idling pollutes:** Each gallon of fuel burned creates about 20 lbs. of greenhouse gases.
- **Idling threatens health:** Breathing vehicle emissions increases the risk of respiratory illness, especially in children.

[if desired, provide a description of a success with idling reduction for a local or regional company.]

We are Organization Name, provide a brief description. I believe we have a shared interest in increasing economic and environmental sustainability. Your organization's previous sustainability efforts, such as specific example, demonstrate an investment in reducing your carbon footprint. With the help of the Clean Cities [IdleBox toolkit](#), we are helping organizations like yours reap the benefits of idling reduction. In addition to the organizational strategies, individual pledges for idling reduction can show your employees how to make a personal contribution.

I will call you in the coming week to request a brief meeting to discuss how you can save money and support the environment with simple measures to reduce idling. If you prefer, please call me directly at the number below.

Sincerely,
Name _____
Title, Organization name _____
Phone number, E-mail address _____

Space for organization's logo

**STOP Idling.
START Saving.**

Organizational Idling Reduction Pledge

We at [name of company or organization] hereby pledge our commitment to idling reduction. In support of this pledge, we establish the following guidelines for our facility, our vehicles, and our employees:

1. Excessive idling (more than seconds/minutes) is prohibited at our facility, including during pickups and deliveries.
2. Drivers of our vehicles will not idle unnecessarily (more than seconds/minutes) on or off site.
3. All employees are encouraged to limit unnecessary idling in their private vehicles.

Name/Signature of Policy Official: _____

Title: _____

Date: _____

Space for organization's logo

Core Resources: Technical Tool Example

Idle Reduction Savings Calculator

Share the **Idle Reduction Savings Calculator** to help fleet managers and others estimate how much they can save with idling reduction.



Idle Reduction Savings Calculator

For an interactive Excel version of this calculator, please go to http://www.transportation.anl.gov/downloads/idling_worksheet.xls

Calculate Costs for Avoidable Idling					
1	How much fuel is used for idling? (If you don't know, see reference table on reverse.)	Realistically, how many hours each year might you use idling reduction (IR) devices instead of idling?	What is the price of fuel?		Avoidable Idling Fuel Costs
	<input type="text"/> gallons/hour	<input type="text"/> hours/year	<input type="text"/> \$/gallon	\times	= \$ <input type="text"/> /year +
	\downarrow	\downarrow			
2	<input type="text"/> gallons/hour	<input type="text"/> hours/year	What is your average fuel economy?	"Miles of idling" (idling is like putting miles on your engine)	
	\times	\times	<input type="text"/> miles/gallon	=	<input type="text"/> miles/year
3	How much does an oil change cost?	How many miles between oil changes?		"Miles of idling"	Preventive Maintenance Cost*
	<input type="text"/> \$/oil change	<input type="text"/> miles/oil change	=	<input type="text"/> miles/year	= \$ <input type="text"/> /year +
4	How much does an engine overhaul or new vehicle cost?	How many miles between overhauls or vehicle replacement?		"Miles of idling"	Overhaul or Replacement Cost*
	<input type="text"/> \$/overhaul or replacement	<input type="text"/> miles/overhaul or replacement	=	<input type="text"/> miles/year	= \$ <input type="text"/> /year
5	Add values in right-hand column =				Total Avoidable Idling Costs
					= \$ <input type="text"/> /year
Calculate Costs for Idling Reduction (IR) – Device and/or Electrified Parking Space (EPS)					
6	How much fuel is used by the IR device?	How many hours each year could you use IR devices instead of idling?*	Price of fuel (same as price listed in line 1)	Fuel cost for IR device	
	<input type="text"/> gallons/hour	<input type="text"/> hours/year	<input type="text"/> \$/gallon	=	<input type="text"/> \$/year
7				Maintenance cost for IR device	Operating Cost for On-board IR Device
				<input type="text"/> \$/year + <input type="text"/> \$/year	= \$ <input type="text"/> /year
8	Cost per hour to plug into EPS	How many hours each year could you use EPSs instead of idling?*	Cost to plug in		Total Operating Costs for IR
	<input type="text"/> \$/hour	<input type="text"/> hours/year	=	<input type="text"/> \$/year + <input type="text"/> \$/year	= \$ <input type="text"/> /year
Calculate Savings from IR					
9				Capital cost of on-board IR device	Payback Time
				<input type="text"/> \$ + <input type="text"/> \$/year saved	= <input type="text"/> years
10	<input type="text"/> ^A	<input type="text"/> ^B	=	<input type="text"/> gallons saved/year	

* Total number of hours from lines 6 and 8 should equal the number of hours in line 1.
 ** U.S. Recommended Practice 110, "Analysis of Costs from Idling and Parasitic Devices for Heavy-Duty Tractor" (2003), Technology & Maintenance Council, American Trucking Associations (TMC/ATA).

www.anl.gov/energy-systems/downloads/vehicle-idle-reduction-savings-worksheet

Core Resources: Technical Tools Example, *cont.*



Idling Reduction Savings Calculator

For an interactive Excel version of this calculator, please go to http://www.transportation.anl.gov/downloads/idling_worksheet.xls.

How Much Fuel Is Used for Idling?

Vehicle Type	Class	Fuel Type	Size Indicator		Idling Fuel Use (gal/h)		Source
			Engine Size (l)	GVWR (lb)	No load	With load	
Passenger Car (Ford Focus)	1	G	2	–	0.16	0.29	ANL 1
Passenger Car (Volkswagen Jetta)	1	D	2	–	0.17	0.39	ANL 1
Passenger Car (Ford Crown Victoria)	1	G	4.6	–	0.39	0.59	ANL 1 & 2
Medium Heavy Truck	6	G	5–7	19,700–26,000	0.84	–	WVU
Delivery Truck	5	D	–	19,500	0.84	1.1 ¹	NREL
Tow Truck	6	D	–	26,000	0.59	1.14 ²	ORNL
Medium Heavy Truck	6–7	D	6–10	23,000–33,000	0.44	–	WVU
Transit Bus	7	D	–	30,000	0.97	–	ORNL
Combination Truck	7	D	–	32,000	0.49	–	ORNL
Bucket Truck	8	D	–	37,000	0.90	1.50 ²	ORNL
Tractor-Semitrailer	8	D	–	80,000	0.64	1.15 ^{3,1}	TMC

D = diesel, G = gasoline, Gal = gallon(s), GVWR = gross vehicle weight rating, h = hour(s), l = liter(s), lb = pound(s), PTO = power take-off.

¹ High idle.

² PTO on.

³ Air conditioning on.

Sources

ANL 1: Slutensberg, K., and Lohse-Busch, H. "APRF [Advanced Powertrain Research Facility at Argonne National Laboratory] Conventional Vehicles Snapshot Study." Presentation to U.S. DOE, December 2, 2012.

ANL 2: Rask, E.; Keller, G.; Lohse-Busch, H.; et al. (2013). "Final Report: Police Cruiser Fuel Consumption Characterization." Work performed by Argonne National Laboratory for the Illinois Tollway Authority.

NREL: National Renewable Energy Laboratory Project Draft Final Report for the Period August 1, 2012, through March 31, 2014, "Data Collection, Testing and Analysis of Hybrid Electric Trucks and Buses Operating in California Fleets." ARB Agreement Number 11-600, NREL Contract Number FIA-12-1763, April 15, 2014.

ORNL: Lascourain, M.B.; Franzese, O.; Capps, G.; et al. (2012). *Medium Truck Duty Cycle Data from Real-World Driving Environments: Project Final Report* (ORNL/TM-2012/240). Work performed by Oak Ridge National Laboratory for the U.S. DOE.

TMC: TMC Recommended Practice 1108, "Analysis of Costs from Idling and Parasitic Devices for Heavy Duty Trucks" (2003). Technology & Maintenance Council, American Trucking Associations (TMC/ATA).

WVU: Khan, ABM S.; Clark, N.N.; Gautam, M.; et al. (2009). "Idle Emissions from Medium Heavy Duty Diesel and Gasoline Trucks." *Journal of the Air & Waste Management Association* (59.3) 354–359.

Other Idling Reduction Resources

- IdleBox www.cleancities.energy.gov/idlebox
- IdleBase <http://cleancities.energy.gov/idlebase>
- National Idling Reduction Network News energy.gov/bere/vehicles/vehicle-technologies-office-national-idling-reduction-network-news
- Argonne National Laboratory <http://www.transportation.anl.gov/engines/idling.html>
- Alternative Fuels Data Center http://www.afdc.energy.gov/conservation/idling_reduction_basics.html



U.S. Department of Energy

Specialty Resources

Specialty Resources



Personal Vehicles

[Idling Reduction for Personal Vehicles](#) 📄 (Fact Sheet)

[Which Is Greener: Idle, or Stop and Restart? Comparing Fuel Use and Emissions for Short Passenger-Car Stops](#) 📄 (Fact Sheet)

[Reducing Personal Vehicle Idling](#) 📄 (Presentation)

[Stop and Restart Effects on Modern Vehicle Starting System Components—Longevity and Economic Factors](#) 📄 (Technical Report)



Light- and Medium-Duty Fleet Vehicles

[Idling Reduction Basics for Fleets](#) 📄 (Presentation)

[Technology Solutions](#) 📄 (Presentation)



Heavy-Duty Vehicles

[Long Haul Truck Idling Burns Up Profits](#) 📄 (Fact Sheet)

[Idling Reduction for Long-Haul, Heavy-Duty Trucks](#) 📄 (Presentation)

[Emissions From Idling Heavy-Duty Trucks and Idling-Reduction Equipment](#) (Technical Report)



Emergency & Other Service Vehicles

[Idling Reduction for Emergency and Other Service Vehicles](#) 📄 (Fact Sheet)

[Case Study – Idling Reduction Technologies for Emergency Service Vehicles](#) (Technical Report)

Specialty Resources: Personal Vehicles



Personal Vehicles

Idling Reduction for Personal Vehicles (Fact Sheet)

Which Is Greener: Idle, or Stop and Restart? Comparing Fuel Use and Emissions for Short Passenger-Car Stops (Fact Sheet)

Reducing Personal Vehicle Idling (Presentation)

Stop and Restart Effects on Modern Vehicle Starting System Components—Longevity and Economic Factors (Technical Report)

Idling Reduction for Personal Vehicles

Idling your vehicle—running your engine when you're not driving it—may seem like a harmless habit, but it's actually a bad habit. For more than 12 seconds, your engine produces pollutants that contribute to smog and climate change. It also wastes fuel and increases your engine's wear.

Research shows that idling from drive-thru and light-duty vehicles combined wastes about 1 billion gallons of fuel annually. About half of that is unnecessary in personal vehicles. Each gallon of fuel contains about 120,000 BTUs of energy. If you iddle for just 10 minutes, you waste about 10 gallons of fuel. That's the same as idling 1 million vehicles for 10 minutes.

Modern cars don't need to idle. Advances in vehicle technology have made it easier than ever to stop idling. Carpooling, carpooling, and carpooling are great ways to reduce idling. Carpooling also reduces emissions and saves money on gas. Carpooling also reduces idling. Carpooling also reduces emissions and saves money on gas.

Consider Your Circumstances

Even though there are a number of reasons for vehicles to idle, if you're at a drive-through restaurant, pharmacy, or bank to help, consider turning off your car while you wait in parking and

Idling May Even Be Illegal

If you're a school or business, you may have enough reasons to avoid idling, even if you're not sure. You could be subject to a fine if you're not sure.

- New York City
- Massachusetts
- New Jersey
- New York
- Virginia
- Hawaii

Plan of California, Colorado, New York, Ohio, Utah, and other states.

Check Clean Air Act regulations for a list of states that have enacted laws to reduce idling. Some states have enacted laws to reduce idling. Some states have enacted laws to reduce idling.

Schools Offer Unique Opportunities

As researchers are often concerned about the effects of poor air quality on children, many anti-idling campaigns have targeted school buses. To protect public health, school buses are subject to more strict policies and more frequent inspections. There are several sources of information on idling campaigns that work for your school. The U.S. Environmental Protection Agency's Clean School Bus (CSB) program provides information on idling campaigns that work for your school. The U.S. Environmental Protection Agency's Clean School Bus (CSB) program provides information on idling campaigns that work for your school.

Everyone Can Contribute

Contact your local Clean Cities and Air Quality Management Agency. These contacts work to reduce idling and are responsible with the support of the U.S. Department of Energy.

- Talk to the principal of your child's school to ask the school to sign the pledge to reduce idling.
- Meet with your school board on a district-wide anti-idling campaign.
- Talk to managers of local drive-through businesses about their idling policies and request that signs be posted to reduce idling.

There are a number of ways drivers can reduce their own idling and encourage others to do the same.

Why Do Drivers Idle? Habits and Myths

"Doesn't restarting my engine use more gas than idling?"

"Isn't idling good for your engine?"

STOP Idling. START Saving.

Specialty Resources: Light- and Medium-Duty Fleet Vehicles



Light- and Medium-Duty Fleet Vehicles

Idling Reduction Basics for Fleets  (Presentation)

Technology Solutions  (Presentation)

Idling Reduction Technology Solutions

- Technology Options To Support Idling Reduction in Light- and Medium-Duty Vehicles
- Calculating Costs
- Savings and Payback
- Funding Resources

Idling Reduction Basics for Fleets

- What Is Idling?
- What Vehicles Idle?
- Some Idling Is Difficult To Avoid
- Much Idling Is Wasteful
- Why Care About Idling?
- What Can YOU Do?
- IdleBox Can Help!

 **STOP Idling.**
START \$aving.


Clean Cities
U.S. Department of Energy

 **STOP Idling.**
START \$aving.


Clean Cities
U.S. Department of Energy

Specialty Resources: Heavy-Duty Vehicles



Heavy-Duty Vehicles

Long Haul Truck Idling Burns Up Profits (Fact Sheet)

Idling Reduction for Long-Haul, Heavy-Duty Trucks (Presentation)

Emissions From Idling Heavy-Duty Trucks and Idling-Reduction Equipment (Technical Report)

What Are the Costs and Consequences of Idling?

Fuel Use, Costs, and Typical Payback

Power Source	Services	Fuel Use (gal/hr)	Typical Equipment Cost (\$)	Charge (\$/hr)	Typical Payback (yr)
Idling	All	0.6-1.5	NA	NA	NA
Auxiliary power unit	All	0.2-0.5	8,000-12,000 ^a	NA	3.6
Diesel-fired heater	Heat	0.04-0.08	900-1,500 ^b	NA	0.6
Heat recovery	Heat (limited duration)	Negligible	600	NA	<1
Storage cooling	Air conditioning	0.15	8,500-8,800 ^a	NA	5
Automatic engine start/stop system	All (intermittent)	0.25	1,500-2,500 ^c	NA	1
EPS (single system)	All	NA	5 ^d	1.85 ^e	NA
EPS (dual system)	All	NA	Up to 2,500 ^d	1.00	1

NA = not applicable; EPS = electrical parking space.
^a Assumptions for payback: 100 gal fuel, 1.0 gal/hr idling, 1.0 gal/hr for idling, 11.5 for APUs, mid-range prices, heat and AC, each hour every 7 days, zero start-up cost, assumed for one engine. 50% of idling time. Changes in any of the assumptions in 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.



U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Long-Haul Truck Idling Burns Up Profits

Long-haul truck drivers perform a vitally important service. In the course of their work, they must take rest periods as required by federal law. Most drivers remain in their trucks, which they keep running to provide power for heating, cooling, and other necessities. Such idling, however, comes at a cost: it is an expensive and polluting way to keep drivers safe and comfortable. Increasingly affordable alternatives to idling not only save money and reduce pollution, but also help drivers get a better night's rest.

Idling Wastes Fuel and Increases Engine Wear

Idling a heavy-duty truck consumes about 0.8 gallon of fuel per hour. Even when diesel costs as little as \$2.50 a gallon, fuel for one 10-hour rest period will cost \$20. Typically, a long-haul truck idles about 1,800 hours per year, using about 1,500 gallons of diesel. Argonne National Laboratory (Argonne) estimates that, in the U.S., rest-period truck idling consumes up to 1 billion gallons of fuel annually at a cost of around \$3 billion. Idling also accelerates engine wear and tear. Where manufacturer warranties and maintenance intervals apply to "hours operated" rather than "miles traveled," the cost of idling is greater than just fuel.

Idling Degrades Air Quality

Argonne estimates that rest-period idling results in the emission of about 11 million tons of carbon dioxide, 55,000 tons of nitrogen oxides, and 400 tons of particulate matter annually in the U.S. These emissions contribute to climate change and diminish local air quality, which can affect the health of not only those living in the community, but the truck drivers themselves.

Idling May Be Illegal

Many state and local laws restrict the idling of heavy-duty trucks, and violating idling laws can result in steep fines. Clean Cities' IdleBase ([cleancitiesenergy.gov/idlebase](http://www.cleancitiesenergy.gov/idlebase)), a database of idling laws and ordinances, catalogs known idling restrictions and penalties for all classes of on-road vehicles. The American Transportation Research Institute (atri-online.org) provides a downloadable cab card for laws specific to heavy-duty trucks.

Alternatives to Idling Heavy-Duty Trucks

Some current idling alternatives use up to 95% less fuel, saving power for climate control and electrical devices. Most APUs are powered by diesel, but battery-powered APUs and alternative-fuel APUs are also available. Some APUs are equipped to plug into a power pedestal for grid power (see Electrified Parking Spaces on the next page).

Auxiliary Power Units

Auxiliary power units (APUs) provide drivers with on-board power for climate control and electrical devices. Most APUs are powered by diesel, but battery-powered APUs and alternative-fuel APUs are also available. Some APUs are equipped to plug into a power pedestal for grid power (see Electrified Parking Spaces on the next page).

Considerations

On-board power allows use wherever needed. APUs have an initial high cost and are heavy, although most states have weight exemptions for APUs (see www.energy.gov/vehicles/map/state-recognition-auxiliary-power-weight-exemption). Diesel APUs can keep the driver comfortable for as long as needed, but require regular maintenance. For trucks model year 2010 and newer, idling emissions are so well controlled that a diesel APU's particulate matter (PM) emissions will actually be higher than the truck engine's emissions. In California, diesel APUs on trucks newer than model year 2007 must be equipped with a diesel particulate filter. Battery APUs are essentially battery-electric air conditioners with heat supplied either by electrical resistance heating or by a diesel bank heater.



U.S. Department of Energy

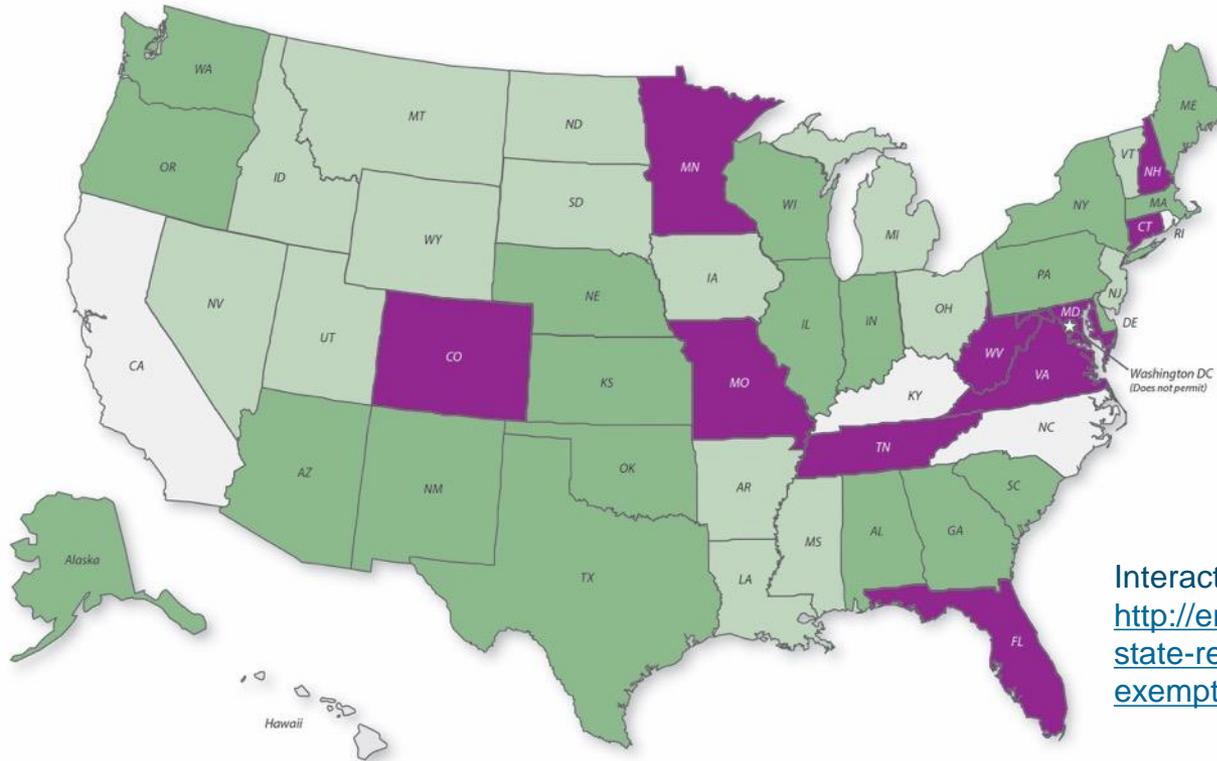
VEHICLE TECHNOLOGIES OFFICE

http://www.afdc.energy.gov/uploads/publication/hdv_idling_2015.pdf



Specialty Resources: Heavy-Duty Vehicles, *cont.*

APU Weight Exemption Status



Interactive map at <http://energy.gov/eere/vehicles/map-state-recognition-auxiliary-power-weight-exemption>

- Allows a 550-lb weight exemption by state law.
- Allows a 400-lb weight exemption by state law.
- Allows a 400-lb weight exemption by enforcement policy rather than by state law.
- Does not permit an APU weight exemption.

Specialty Resources: Emergency & Other Service Vehicles



Emergency & Other Service Vehicles

Idling Reduction for Emergency and Other Service Vehicles  (Fact Sheet)

Case Study – Idling Reduction Technologies for Emergency Service Vehicles (Technical Report)

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Idling Reduction for Emergency and Other Service Vehicles

Emergency vehicles, such as police cars, ambulances, and fire trucks, along with other service vehicles such as armored cars, are often exempt from laws that limit engine idling. However, these vehicles can save fuel and reduce emissions with technologies that allow them to perform vital services without idling.

Police Vehicles

Police cruisers spend much of their time parked and running while officers monitor traffic, help at accident scenes, write reports, and wait to be called. Officers commonly require lights, radios, computers, radar, and video cameras.

In one recent report about police vehicle fuel consumption, the cruiser studied was found to idle 60% of the time during normal operation and used 21% of its total fuel while parked. While the engine provided 250 horsepower (hp), together all of the accessories needed less than 2 hp. (Air conditioning consumed the most power, followed by external lighting.)

Several idling-reduction systems, with varying capabilities and costs, are available for police vehicles. Power-management systems may significantly reduce (but not eliminate) idling.

They allow the vehicle's battery to power auxiliaries in engine-off mode and monitor the battery's state-of-charge. When the battery charge falls below a preset threshold, the system restarts the vehicle's engine to recharge the battery.

Another option is a heat-recovery device, which uses a small pump to circulate coolant from the warmed engine, providing heat to the passenger compartment after the engine has been turned off.

Battery auxiliary power units (APUs) are another option for police vehicles. These units store power when the engine is running and supply it to the vehicle's electrical devices for 4 hours or more when the engine is off.



Police vehicle auxiliaries call that fits in the trunk. Used with permission of the U.S. Department of Energy.

Ambulances

Ambulance engines are idled to power medical equipment, computers, refrigeration equipment, as well as the vehicle. Idling these diesel engines not only wastes fuel but produces significant respiratory or cardiovascular pollution.

On-board battery-powered APUs needed functions are available: the APU to charge at the hospital while the ambulance is being used. The APU is installed on the roof to provide additional power and receive conditions.



Ambulance hooked up to a battery-powered APU and conditioned air. Used with permission of the U.S. Department of Energy.



VEHICLE TECHNOLOGIES OFFICE



ANL/ESD-16/3

Case Study – Idling Reduction Technologies for Emergency Service Vehicles

Energy Systems Division



http://www.afdc.energy.gov/uploads/publication/idling_emergency-service_vehicles.pdf



IdleBox Tool: IdleBase



cleancities.energy.gov/idlebase

IdleBox Tool: IdleBase, cont.

A	B	C	D	E	F	G
Illinois	Type of Vehicle	Idling Restriction	Exemptions	Consequences of Infraction	Regulation	Resources
Counties in the Chicago Area: <ul style="list-style-type: none"> • Cook • DuPage • Lake • Kane • McHenry • Will • Aux Sable and Goose Lake Townships in Grundy • Oswego Township in Kendall Counties in the Metro East St. Louis Area: <ul style="list-style-type: none"> • Madison • St. Clair • Monroe 	Diesel vehicles: ≥8,000 lbs	10 minutes/hour	Traffic conditions or controls. Prevent a health or safety emergency. Emergency or law enforcement purposes. Service or repair. Government inspection. Idling necessary to operate auxiliary equipment to accomplish intended use of vehicle. Guarding contents of armored vehicle. Bus can idle a maximum of 15 minutes/hour to maintain passenger comfort. Resting in sleeping berth. Mechanical difficulties out of control of operator. Airport ground control support. Buses owned by public transportation authorities on bus route. Implements of husbandry. Electric utility service vehicles. If temperature <32F or >80F, idle limit to 30 minutes/hour while in queue.	\$90 for first conviction. \$500 for second or subsequent conviction in 12-month period. Fines are divided and paid to 3 groups, dependant on the county that wrote the ticket.	625 Illinois Compiled Statutes (ILCS) 5/11-1429	http://www.lga.gov/legislation/ilcs/fulltext.asp?DocName=062500050K11-1429
City of Chicago	Diesel-powered vehicles	3 minutes/hour	Emergency vehicles providing health and safety services. Airport support vehicles necessary for airport operations. Engine running is necessary to operate auxiliary equipment to accomplish the intended use of the vehicle. Vehicles standing with engine running for purpose of service, repair, or inspection. Vehicles standing in traffic. Air conditioning if temperature >80F or heat if temperature <32F. Operation of APU or generator set. Mechanical requirements or difficulties out of operator's control. Vehicles standing due to automatic regeneration of diesel particulate filters or pre-shutdown cooling required by engine manufacturer.	\$250 per violation	Chicago Municipal Code, Section 9-80-095	http://www.cityofchicago.org/dam/city/depts/dao/general/ESB_PD/Es/StandingLimitOrdinanceAssessed.pdf



National Idling Reduction Network News

Want to follow potential funding opportunities? Subscribe!



The screenshot shows the Energy.gov website header with the logo and navigation menu. The main content area features the title "VEHICLE TECHNOLOGIES OFFICE: NATIONAL IDLING REDUCTION NETWORK NEWS" and a brief description of the network's mission. A sidebar on the left contains links for "Vehicles Home", "About Vehicle Technologies Office", and "Plug-in Electric Vehicles & Batteries".

ENERGY.GOV
Office of Energy Efficiency & Renewable Energy

Search Energy.gov

SERVICES | EFFICIENCY | RENEWABLES | TRANSPORTATION | ABOUT US | OFFICES >

Home » Vehicle Technologies Office: National Idling Reduction Network News

VEHICLE TECHNOLOGIES OFFICE: NATIONAL IDLING REDUCTION NETWORK NEWS

Vehicles Home
The National Idling Reduction Network brings together trucking and transit companies; railroads; ports; equipment manufacturers; Federal, state, and local government agencies (including regulators); nonprofit organizations; and national research laboratories to identify consistent, workable solutions to heavy-vehicle idling for the entire United States. Below is the most recent issue; the archives are available on the [Archives page](#).

About Vehicle Technologies Office

Plug-in Electric Vehicles & Batteries

<http://energy.gov/eere/vehicles/vehicle-technologies-office-national-idling-reduction-network-news>

To subscribe, visit the link above or e-mail pweikersheimer@anl.gov

IdleBox in Use

IdleBox has a range of uses, from policy development to fleet outreach to messaging to the general public.

West Palm Beach, Florida, used IdleBox materials for the launch of its no-idling policy for public utility vehicles (November 2014).



IdleBox in Use, cont.



Bank of Utah used IdleBox materials to encourage its drive-through-window users to shut down rather than idle while waiting in line (February 2015).

<http://www.good4utah.com/news/midday/how-you-can-reduce-air-pollution/205564819>

IdleBox in Use, cont.



The poster features a red header with the text "ENVIRONMENTAL INITIATIVES" and "REDUCE OUR CARBON FOOTPRINT" next to a green leaf icon. Below this is the main headline "STOP Idling. START \$aving." with a key icon. Three bullet points follow: "IDLING IS EXPENSIVE" (up to a gallon of fuel per hour), "IDLING POLLUTES" (a gallon of fuel creates about 20 lbs. of greenhouse gases), and "IDLING THREATENS HEALTH" (breathing vehicle emissions increases risk of respiratory illness). The ComEd logo is present, along with a circular seal for "ComEd ISO 14001 Certified SINCE 2008". A large green graphic at the bottom contains the text: "Idling uses more fuel than restarting your engine. Unnecessary idling at ComEd wastes over HALF A MILLION GALLONS of fuel AND more than \$2 MILLION each year".

ENVIRONMENTAL INITIATIVES
REDUCE OUR CARBON FOOTPRINT

**STOP Idling.
START \$aving.**

IDLING IS EXPENSIVE
up to a gallon or more of fuel per hour, depending on vehicle size

IDLING POLLUTES
a gallon of fuel creates about 20 lbs. of greenhouse gases

IDLING THREATENS HEALTH
breathing vehicle emissions increases risk of respiratory illness

ComEd
An Exelon Company

Idling uses more fuel than restarting your engine

Unnecessary idling at ComEd wastes over **HALF A MILLION GALLONS** of fuel AND more than **\$2 MILLION** each year

ComEd ISO 14001 Certified
SINCE 2008

© Commonwealth Edison Company, 2011

"At **ComEd**, we used the IdleBox toolkit to create posters and information cards that were used for an internal education program. Employees provided feedback that the anti-idling booth was their favorite of the day, and many said that they were going to change their behavior to limit or reduce idling of their personal vehicles after hearing about the impacts."

–**Marla Westerhold** of the **Environmental Department at ComEd**, Illinois' largest electric utility.

Wrapping Up: Organizing an Idling Reduction Campaign

- Target audience
- Strategy
- Messaging



Success with IdleBox: Tips from Clean Cities Coalitions

- Seek collaborative partnerships with other organizations that will benefit.
- Start with closest stakeholders/partners and build from those successes.
- Reach out to new audiences knowing that success will take multiple “touches.”
- Consider outreach to nontraditional fleets (e.g., Meals on Wheels).
- Use IdleBox to assist in ordinance development and outreach to local media.

We welcome your questions, feedback, and comments!

Work sponsored by the Clean Cities Program, U.S. Department of Energy's Office of Vehicle Technologies, to which we give our thanks.

For questions about IdleBox, contact:

Patricia Weikersheimer

Argonne National Laboratory

pweikersheimer@anl.gov

630-252-3124

For technical questions, contact:

Linda Gaines, PhD

Argonne National Laboratory

lgaines@anl.gov

630-252-4919

