

Iowa Clean Cities Coalition is a program of



IDLE REDUCTION TECHNOLOGIES
Opportunities for Fuel Savings and Emission Reduction Incentives

INTRODUCTION

Idle Reduction Technologies (IRTs) reduce the amount of time an engine spends idling by using an alternative technology which is installed on a vehicle. An IRT can be added onto an existing vehicle or ordered as an option on a new vehicle. It provides services such as heat, air conditioning, and/or electricity to the vehicle that would otherwise require the main engine to run while it is stationary.

Reducing idling can decrease fuel costs, maintenance costs, noise, harmful emissions, and can extend the engine's life. Idling can also be reduced through driver training, policies, and voluntary programs focused on changing behavior.

EQUIPMENT

Technology	Function	Advantages	Disadvantages	Type of User
Auxiliary Power Unit (APU)	Provides power for climate control and electrical devices	Portable unit, recovers waste heat for space heating	Heavy, higher cost	Trucks, cars, buses, marine vehicles, emergency vehicles
Fuel Operated Heaters (FOH) aka Direct Fired Heaters (DFH)	Provides heat for the cabin/ interior	Small, lightweight, low emissions	Only provides heat, requires battery power	Trucks and Buses
Battery Air Conditioning Systems (BAC)	Uses batteries to provide cooling to the cabin	Zero emissions	Heavy, higher cost	Trucks
Thermal Storage Systems (TSS)	Collects heat energy as a truck is driving and uses it to provide air conditioning	Quiet, no batteries needed, no fuel input, no emissions	Only provides cooling, limited cooling time	Trucks, cargo ships
Electrified Parking Spaces (EPS)	Provides power from external source for heat, A/C, temperature control and/or appliances from an external source	Provides any auxiliary needs, quiet, no local emissions	Requires equipped location, may require on-board equipment	Trucks, refrigeration units, emergency response vehicles

DIESEL EMISSIONS REDUCTION ACT (DERA)

The Diesel Emissions Reduction Act (DERA) is a grant program that appropriates funds for projects that will reduce diesel emissions. Idle Reduction Technologies qualify for funding under DERA.

Administered by the Environmental Protection Agency (EPA), the DERA grant program is used to achieve significant reductions in diesel emissions. There is a national clean diesel program and a state clean diesel program.

- **National Clean Diesel Program:** solicits proposals nationwide for projects, encompassing 70% of the appropriation. www.epa.gov/cleandiesel/clean-diesel-national-grants
- **State Clean Diesel Program:** funds projects solely within the state, representing 30% of the appropriation, including an incentive for states that match the original amount allocated to them. The Iowa Department of Transportation (DOT) is the administrator of the State of Iowa's DERA allocation. Information regarding the grant program can be found at: www.iowadot.gov/dera.

ELIGIBILITY AND COST-SHARE REQUIREMENTS

IRTs qualify for the DERA program through two eligible activities: highway idle reduction and locomotive idle reduction.

Eligible Activity	DERA Funding Limits	Minimum Cost-Share
Highway Idle Reduction	25%	75%
Locomotive Idle Reduction	40%	60%

Source: Iowa's 2017 DERA Program Info Guide: iowadot.gov/dera/pdfs/DERA_Grant_Program_Info_Guide.pdf

No funds awarded under the DERA program shall be used for the purchase of APUs or generators for vehicles with engine model year 2007 or newer. APUs are only eligible for installation onto engines with a model year between 1995-2006.

The type and use of technology proposed for funding must exist on the EPA's SmartWay List of Verified Idle Reduction Technologies (www.epa.gov/verified-diesel-tech/smartway-verified-list-idling-reduction-technologies-irts-trucks-and-school).

IDLE BOX TOOLKIT FOR IDLING REDUCTION PROJECTS

The U.S. Department of Energy's Clean Cities program and Argonne National Laboratory created the Idle Box Toolkit to support local idle reduction initiatives. The Idle Box provides educational outreach material such as presentations specific to different vehicle types, outreach letters, pledge forms, sign and poster templates, and technical resources.

Idle Box includes an Idling Reduction Savings Calculator that can help calculate potential savings from reduced vehicle idling time, which can factor in the cost of the IRT. This calculator is available in both PDF and Excel format, and can be found at:

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

The complete Idle Box Toolkit can be found at: cleancities.energy.gov/technical-assistance/idlebox/

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: Stutenberg, 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: Lascurain, 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.

HELPFUL LINKS

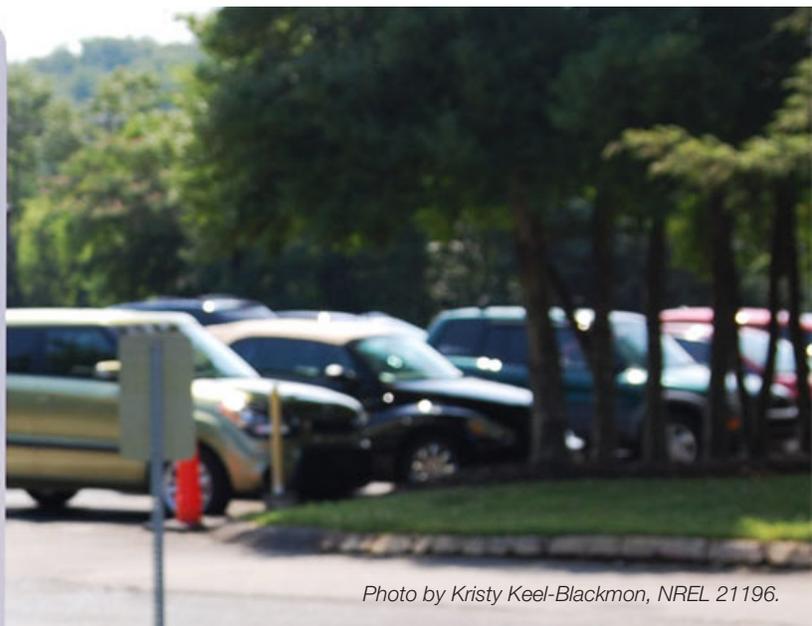
- **Verified Technologies for SmartWay and Clean Diesel** www.epa.gov/verified-diesel-tech/learn-about-idling-reduction-technologies-irts-trucks-and-school-buses
- **Idle Reduction: Why is it important? What are ways I can prevent idling, and what are the benefits of doing so?** cleancities.energy.gov/blog/idle-reduction
- **National Center for Transit Research: Synthesis of Research on the Use of Idle Reduction Technologies in Transit**
www.nctr.usf.edu/wp-content/uploads/2016/01/Transit-Idle-Reduction-Synthesis.pdf

Case Studies

- **Idling Reduction Technologies for Emergency Service Vehicles**
 - **Summary** www.ipd.anl.gov/anlpubs/2016/03/125155.pdf
 - **Full Case Studies**
www.afdc.energy.gov/uploads/publication/idling-reduction-for-emergency-vehicles.pdf
- **Do Anti-Idling Technologies Work?**
www.government-fleet.com/article/story/2014/11/anti-idling-technologies-do-they-work.aspx
- **Dallas Police Department Reduces Vehicle Idling** www.afdc.energy.gov/case/9
- **The Heat is on in St. Louis** www.afdc.energy.gov/case/9
- **Saving Fuel in the Garden State with Truck Stop Electrification** www.afdc.energy.gov/case/1209
- **Delaware Reduces Truck Idling with Electrified Parking Areas** www.afdc.energy.gov/case/1182

ABOUT THE IOWA CLEAN CITIES COALITION

The Iowa Clean Cities Coalition is a designated member of the United States Department of Energy's (US DOE) Clean Cities program and housed at the Iowa Economic Development Authority. The Iowa Clean Cities Coalition works to advance the nation's economic, environmental and energy security by supporting local actions to advance alternative fuels and improve efficiency in transportation.



Iowa Clean Cities Coalition is a program of



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