

Idle Reduction Technologies

**Clean Cities
2008**



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Transportation Safety & Environment

Espar Heater Systems



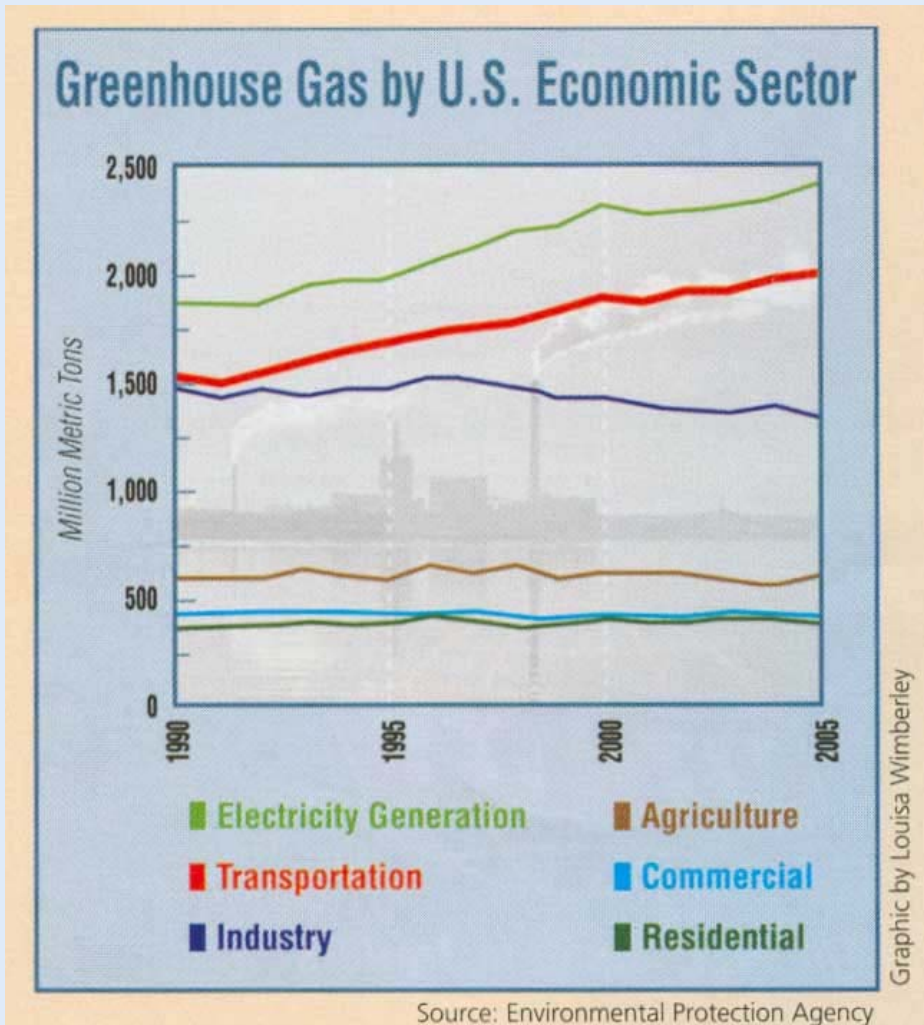
- We just celebrated our 35th anniversary in the North American market
- Fuel Operated Heaters are an accepted technology
- Our heaters are used in:
 - Trucks, School Buses, Transit Buses, Construction/Mining, RV & Marine
- Airtronic *Air Heaters* 7,500 to 27,000 BTU
- Hydronic *Coolant Heaters* 13,700 to 120,000 BTU

Focus on Environment



- Espar is an original EPA SmartWays partner
- Espar went through the CARB approval process for our most popular heaters and received ULEVII approval
- Espar heaters save fuel and greatly reduce emissions by allowing vehicles engines to be turned off and have engine pre-heat and supplemental compartment heat

U S Carbon Footprint



Note **RED** line for
TRANSPORTATION

The **TRANSPORTATION**
SECTOR is the **second**
highest producer of
Greenhouse Gas and
trend line shows steady
increase from 1990 to
present

U.S. School Buses



- The US has 474,380 school buses
- 24 million American children ride school buses daily²
- On average, children spend one and a half hours daily on the bus²
- Buses travel 4 billion miles a year²
- Buses consume 550 million gallons of fuel per year

Descending order-- number of school buses in cold states ¹	Approximate number of school buses
New York	50,000
Pennsylvania	28,300
New Jersey	22,700
Ohio	19,000
Michigan	17,000
Illinois	16,000
Minnesota	13,600
Indiana	13,000
Wisconsin	10,000
Massachusetts	9,000

¹ Chart Info--[School Transportation News](#) – 2008 Fact Book Issue

² www.epa.gov/cleanschoolbus/

Some Bus Facts



- A bus gets about 7 miles per gallon
- A bus idling gets 0 miles per gallon
- Some districts in the northeast have said that they idle the bus 4 hours per day in cold weather for engine pre-heat and defrost
- One hour of idling puts the same wear on the engine as two hours of driving the bus and reduces the life of the engine oil by 75%*
- Idling releases thousands of tons of greenhouse gases into our atmosphere
- Average bus turnover rate is 12 years—older buses generally = more emissions

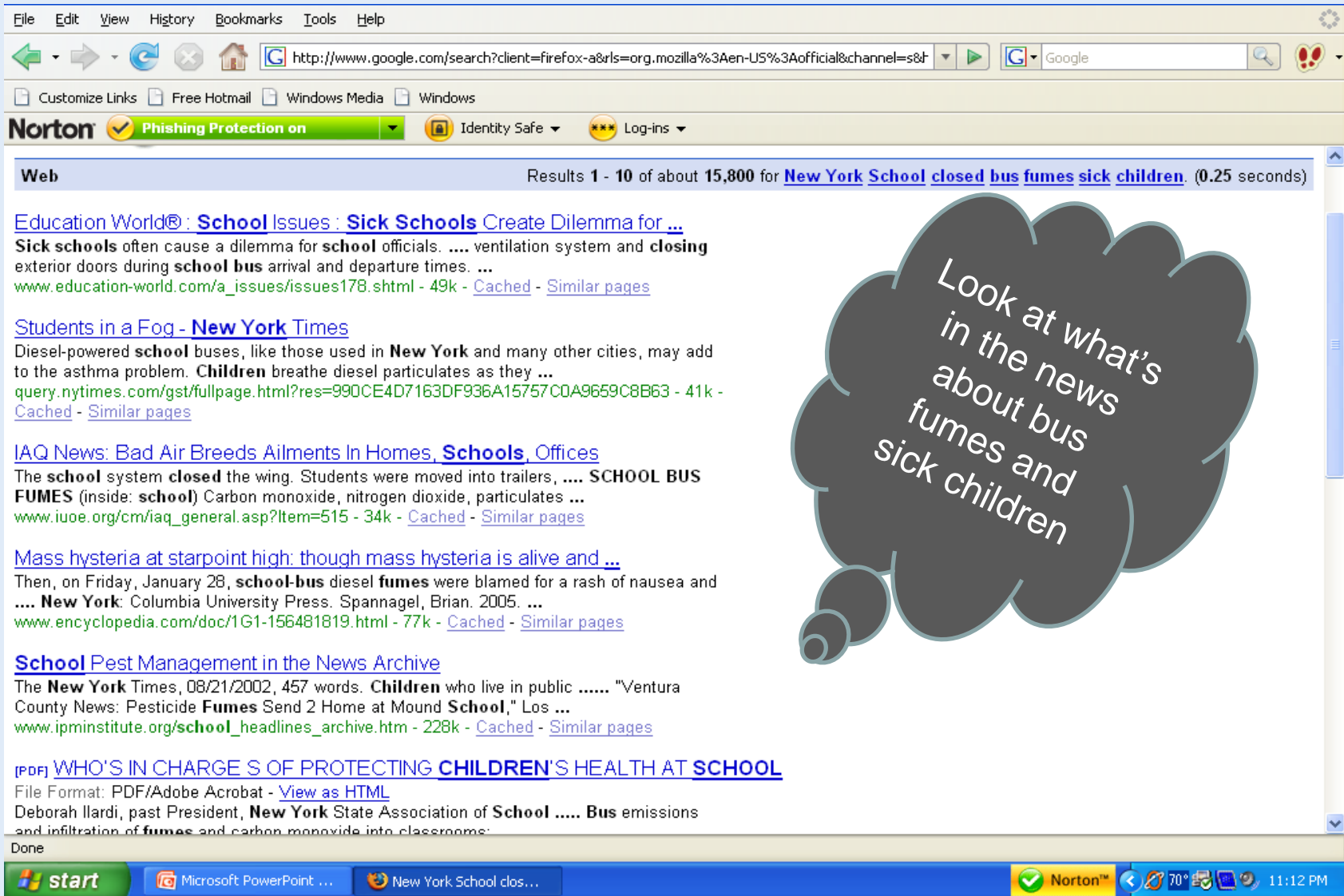
* Idling Gets You Nowhere Office of Energy Efficiency, Natural Resources Canada

Bus Fumes

- **Bus exhaust fumes have sickened children while school buses idled outside of schools**
 - Caused breathing difficulties, respiratory infections, and attacks of asthma and chronic bronchitis. *
 - Children are breathing more fumes at their shorter height --waiting or walking near bus exhaust
 - Fumes –carbon monoxide—plus other pollutants-- have entered schools while buses idled outside for an extended time period



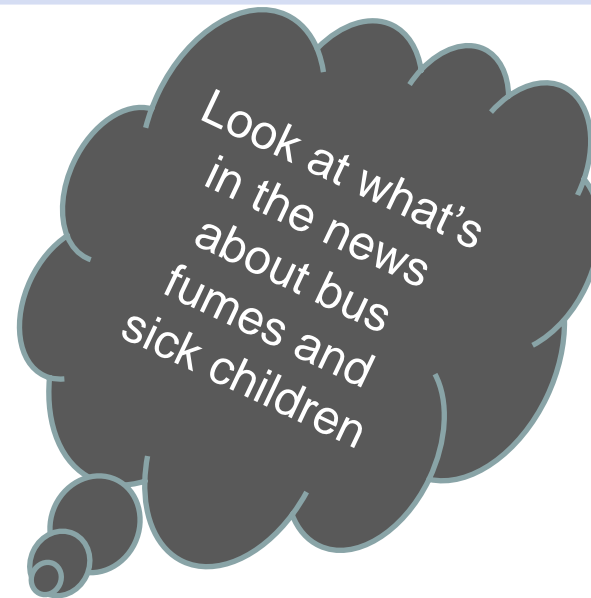
Why NOT idle the bus?



The screenshot shows a web browser window with the following content:

- Address bar: <http://www.google.com/search?client=firefox-a&rls=org.mozilla%3Aen-US%3Aofficial&channel=s&...>
- Search results for "New York School closed bus fumes sick children" (0.25 seconds).
- Search results include:
 - Education World®: School Issues: Sick Schools Create Dilemma for ...**
Sick schools often cause a dilemma for school officials. ventilation system and closing exterior doors during school bus arrival and departure times. ...
www.education-world.com/a_issues/issues178.shtml - 49k - [Cached](#) - [Similar pages](#)
 - Students in a Fog - New York Times**
Diesel-powered school buses, like those used in New York and many other cities, may add to the asthma problem. Children breathe diesel particulates as they ...
query.nytimes.com/gst/fullpage.html?res=990CE4D7163DF936A15757C0A9659C8B63 - 41k - [Cached](#) - [Similar pages](#)
 - IAQ News: Bad Air Breeds Ailments In Homes, Schools, Offices**
The school system closed the wing. Students were moved into trailers, SCHOOL BUS FUMES (inside: school) Carbon monoxide, nitrogen dioxide, particulates ...
www.iuoe.org/cm/iaq_general.asp?Item=515 - 34k - [Cached](#) - [Similar pages](#)
 - Mass hysteria at starpoint high: though mass hysteria is alive and ...**
Then, on Friday, January 28, school-bus diesel fumes were blamed for a rash of nausea and New York: Columbia University Press. Spannagel, Brian. 2005. ...
www.encyclopedia.com/doc/1G1-156481819.html - 77k - [Cached](#) - [Similar pages](#)
 - School Pest Management in the News Archive**
The New York Times, 08/21/2002, 457 words. Children who live in public "Ventura County News: Pesticide Fumes Send 2 Home at Mound School," Los ...
www.ipminstitute.org/school_headlines_archive.htm - 228k - [Cached](#) - [Similar pages](#)
 - [PDF] WHO'S IN CHARGE S OF PROTECTING CHILDREN'S HEALTH AT SCHOOL**
File Format: PDF/Adobe Acrobat - [View as HTML](#)
Deborah Ilardi, past President, New York State Association of School Bus emissions and infiltration of fumes and carbon monoxide into classrooms:

At the bottom of the browser window, there is a taskbar with the Start button, open applications (Microsoft PowerPoint, New York School clos...), Norton security, and system tray icons (70° temperature, network, volume, and time 11:12 PM).



Why is it **SMART** to reduce truck & school bus idling and use idle reduction devices?

#1 Reduction in harmful exhaust

- Carbon dioxide
- Carbon monoxide & other pollutants

#2 Reduction in fuel use

- Preserves natural resources
- Reduces our use of imported fuels
- Saves **\$\$\$\$** in a time of rising fuel costs



Accepted Technologies

Idle Reduction in Cold Weather

Fuel Operated Heaters

- Can be used anywhere
- Available as an option on new trucks & buses
- Able to retro-fit existing trucks & buses
- Small units (*size of a breadbox*) powered with vehicle's fuel to provide heat without idling the engine
- Use approximately 87% less fuel per hour than idling the engine.
- Have a proven track record and are efficient*
- Reduce condensation and incomplete engine combustion which causes engine deposits and contaminates engine oil*
- Prolongs the life of the bus engine because of less running hours*
- Reduces the frequency of oil changes in engine and bus maintenance time*
- CARB (California Air Resource Board approved) ULEVII



*Source—FleetSmart, IDLING GETS YOU NOWHERE, publication, Natural Resources Canada

Cost Savings on a Truck



- Trucks use one gallon of fuel per hour of idle
- Trucks may idle for 8 hours per night while driver takes mandatory rest breaks in addition to idling while waiting to load
- Fuel savings would be 8 gallons per night or \$48 per night if fuel cost \$4 per gallon
- Substantial reduction in emissions could be saved by using fuel operated heaters
- Heaters can pay for themselves in 2 months

\$\$\$ Cost Savings on School Bus



- A diesel engine on a school bus uses at least a half gallon of fuel per hour idling —*possibly more depending on engine size & idling speed*
- Some districts reported (*not identified*) discretionary idling —*unnecessarily*-- for 4 hours per day
- Fuel savings would be about 2 gallons per day, per bus —or \$8 per day (if fuel is \$4 per gallon)
- *Example—if you have 100 buses in the fleet and save 2 gallons of fuel daily per bus for 100 days (5 cold months on school days), there would be a savings of \$80,000 if fuel cost \$4 per gallon for the bus fleet*

Espar is working for the future - - -

- Our new heater is capable of 100% biofuel
- New integrated systems for 2010 for eliminating nitrogen oxides in future diesel powered vehicles
- Our subsidiary Catem DEVELEC offers electric auxiliary heaters for future generation of hybrid, electric and fuel cell vehicles

E-GUARDIAN series



Espar Heater Systems
 6099A Vipond Drive
 Mississauga, Ontario
 L5T 2B2, Canada
 905-670-0960
 800-387-4800
 905-670-0907 fax
 inquiries@espar.com
 www.espar.com

They're Simple!

Engine pre-heaters operate as hot water furnaces utilizing the buses own diesel fuel and batteries to produce heat.

Effective!

the heater's water pump circulates engine coolant to transfer heat to the engine and heat exchangers

Convenient!

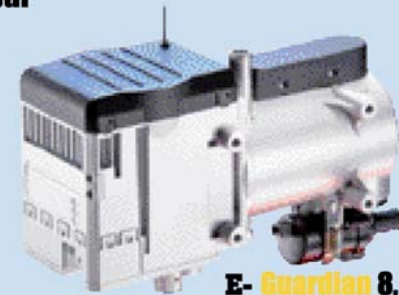
Timer control switches heater on 1-2 hours prior to engine start up.



Stop Idling, Think Safety, Go with Espar



E-Guardian 5



E-Guardian 8, 10, 12

E-Guardian specifications	5 12/24V	8 (PME) 12/24V	10 12/24V	12 12/24V
Heating Output - BTu/hr	8,200 - 17,000	5,120 - 27,300	5,120 - 32,450	4,100 - 42,000
Electrical Consumption - Amps	1.9-4.2/1.95-2.1	2.6-4.6/1.3-2.3	2.6-6.2/1.3-3.1	2.4-8.4/1.2-4.2
Fuel Consumption - gal/h	0.08 - 0.16	0.05 - 0.24	0.05 - 0.32	0.04 - 0.40
Weight - lbs	6.4	14	14	14
Dimensions - inches (l x w x h)	8.6 x 3.5 x 6.2	13 x 5.4 x 8.6	13 x 5.4 x 8.6	13 x 5.4 x 8.6

E-Guardian is our new family of heaters for the school bus market.

Air heaters and coolant heaters are sized for individual buses and trucks. Work with our experienced technicians to select the heater that will be best for you.

One of our new heaters-- just released with state of the art engineering for safety and efficiency --will run on 100% bio-diesel.

Please ask questions or later contact us by phone or visit our website.



www.espar.com



IDLE REDUCTION



For a cleaner environment and responsible use of scarce natural resources

For today and for the future of our children

