

The background features a pattern of overlapping green circles of various shades. In the upper right, there is a faint, stylized image of a globe showing continents and oceans.

Project Green Bus

By: Green Team

Proposal

- We want to ask our local school system, Bardstown Independent, to make our schools greener by reducing their emissions.

Ways to reduce school bus emissions

- Regular maintenance
- Idling Reduction
- Retrofitting
- Biodiesel

The background is a vibrant green with a pattern of small, overlapping circles. A large, semi-transparent circle is centered on the page, containing the word "Maintenance" in a black, italicized serif font. The overall design is clean and modern, with a focus on the central text.

Maintenance

Regular Maintenance

- Buses have reduced emissions with regular maintenance.
- Use a check-list to regularly service your buses:
 - School Bus Maintenance Checklist

The background features a repeating pattern of green circles in various shades. Overlaid on this are several semi-transparent circular shapes. Two of these circles contain a high-resolution image of the Earth from space, showing cloud patterns and landmasses. The central text is positioned within one of the larger, lighter green circles.

Idling Reduction

Reduce Idling

- Why?
 - Idling diesel engines release PM (particulate matter).
- What does PM do?
 - Contributes to allergy symptoms including irritation of airways.
 - Aggravates bronchitis, pneumonia, and asthma attacks.
 - Linked to cancer, increased heart attack risk, and death.

Idling Policy

- Approximately 4-5 min. to build up air pressure when starting route.
- Approximately 1-2 min. to cool down the turbo at the end of the route.

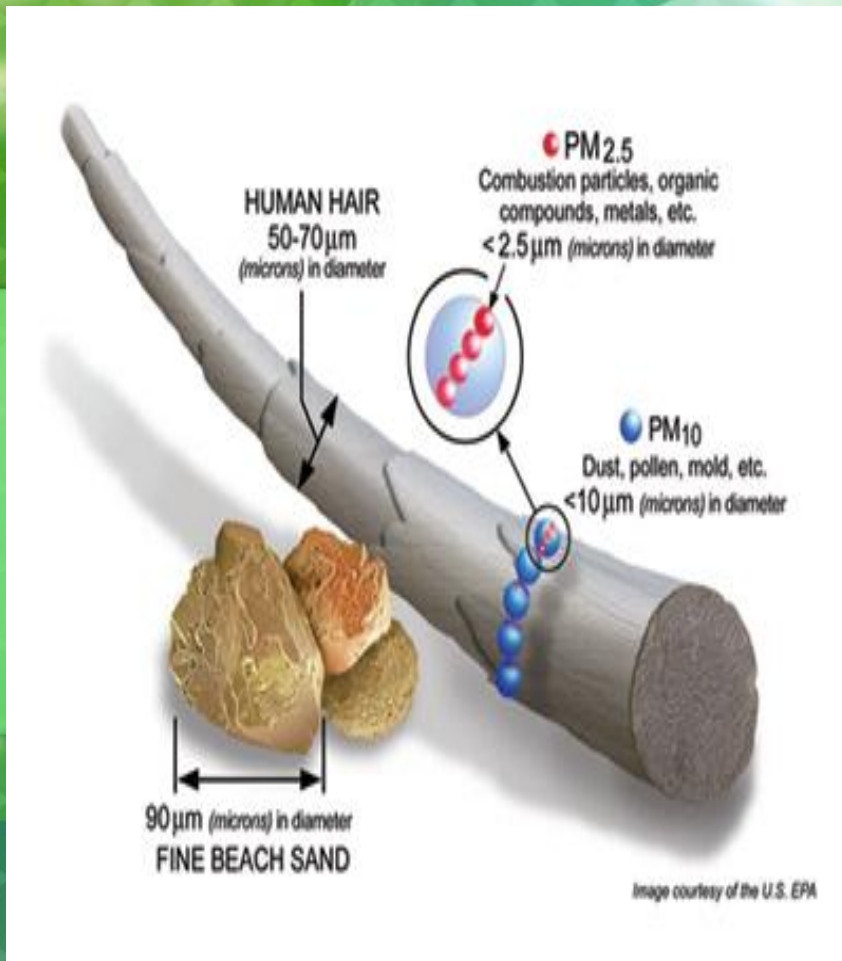
Why is an idling policy necessary?

- Unnecessary idling releases greater concentrations of PM into the atmosphere.
- While the bus is idling the PM is consistently released into one area, thus increasing the concentration of the PM in that particular area.
- As concentrations in the air increase, the ability for the emissions to dissipate (spread out) decreases.

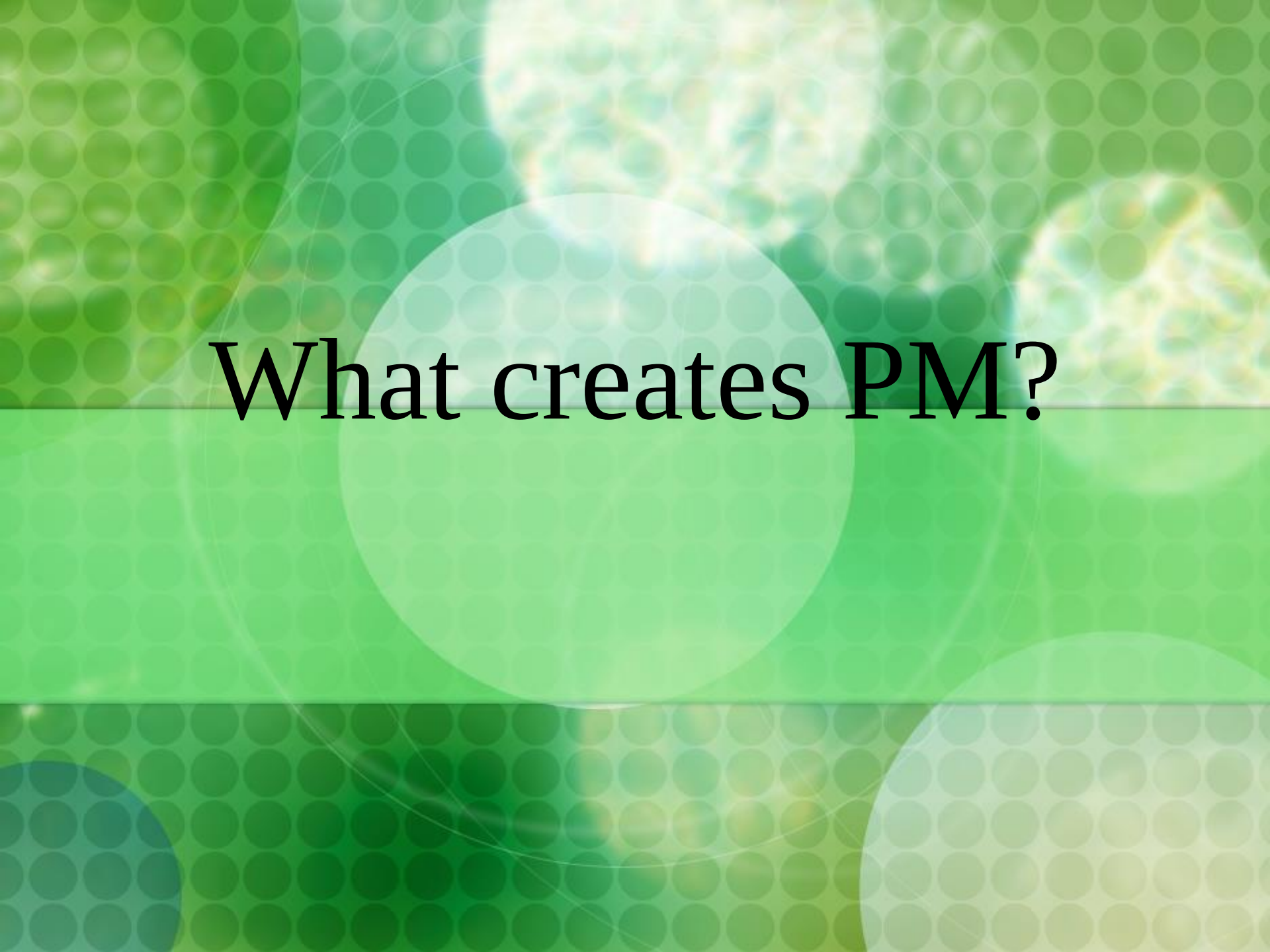


How big is PM?

- Comparison:
 - Human Hair: 10 μm
 - Beach Sand: 90 μm
 - Particulate Matter: 2.5 μm



1 μm (1 micrometer) = one-millionth of a meter.

The background is a vibrant green with a pattern of overlapping circles in various shades of green. A large, semi-transparent globe is centered in the upper half of the image. The text "What creates PM?" is written in a black, serif font across the middle of the image.

What creates PM?

Large Diesel Trucks



Buses



Cars and Trucks

Syed Asif



Industrial Factories



Forest Fires



Diesel Powered Off Road Vehicles and Equipment



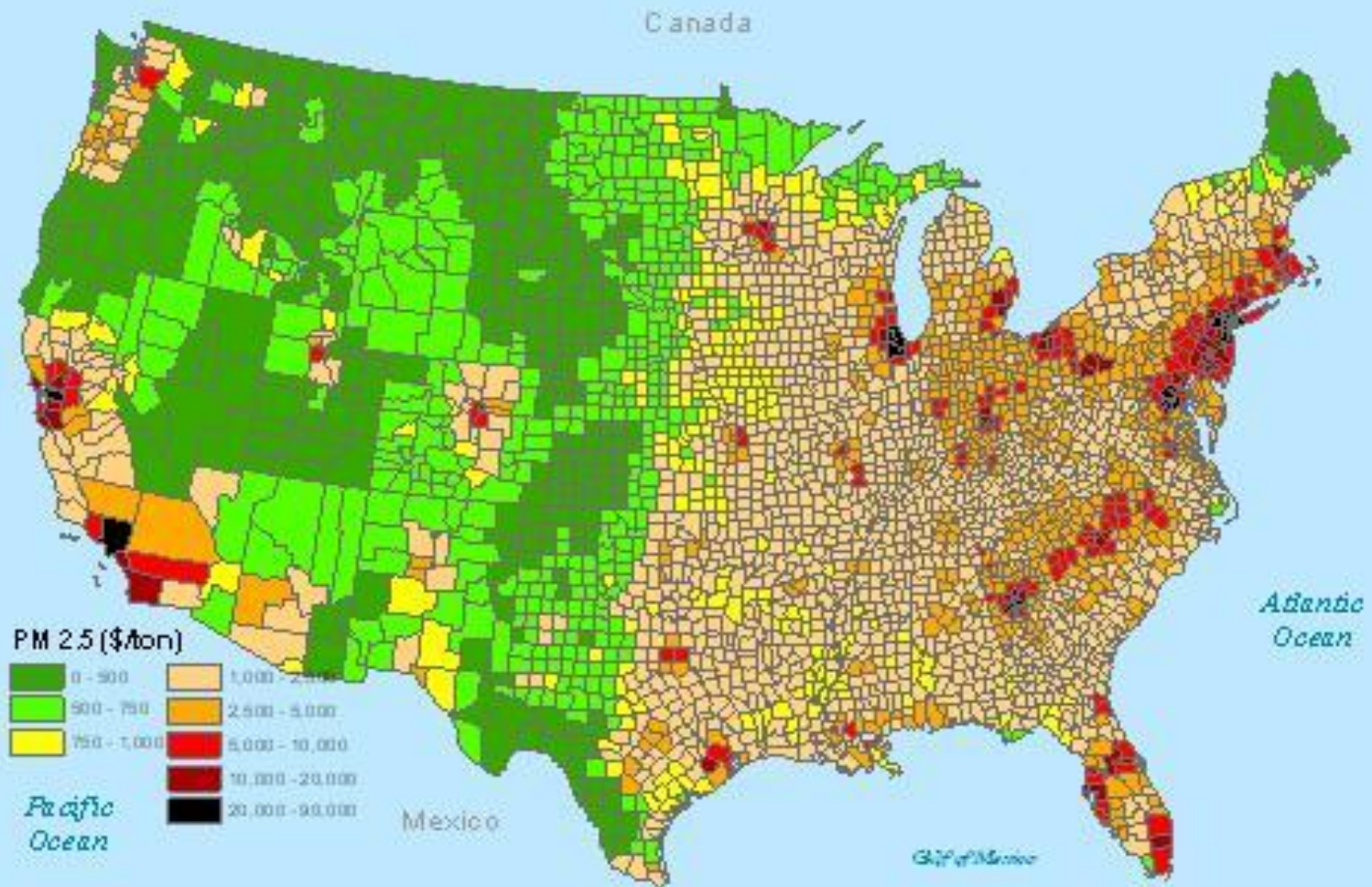
Power Plants



Wood Burning Stoves



Nationwide PM 2.5 Emissions



The background of the slide is a solid green color with a pattern of small, semi-transparent white circles. A large, semi-transparent white circle is centered on the slide, containing the word "Retrofitting" in a black, italicized serif font. The overall design is clean and modern, with a focus on the central text.

Retrofitting

Retrofitting

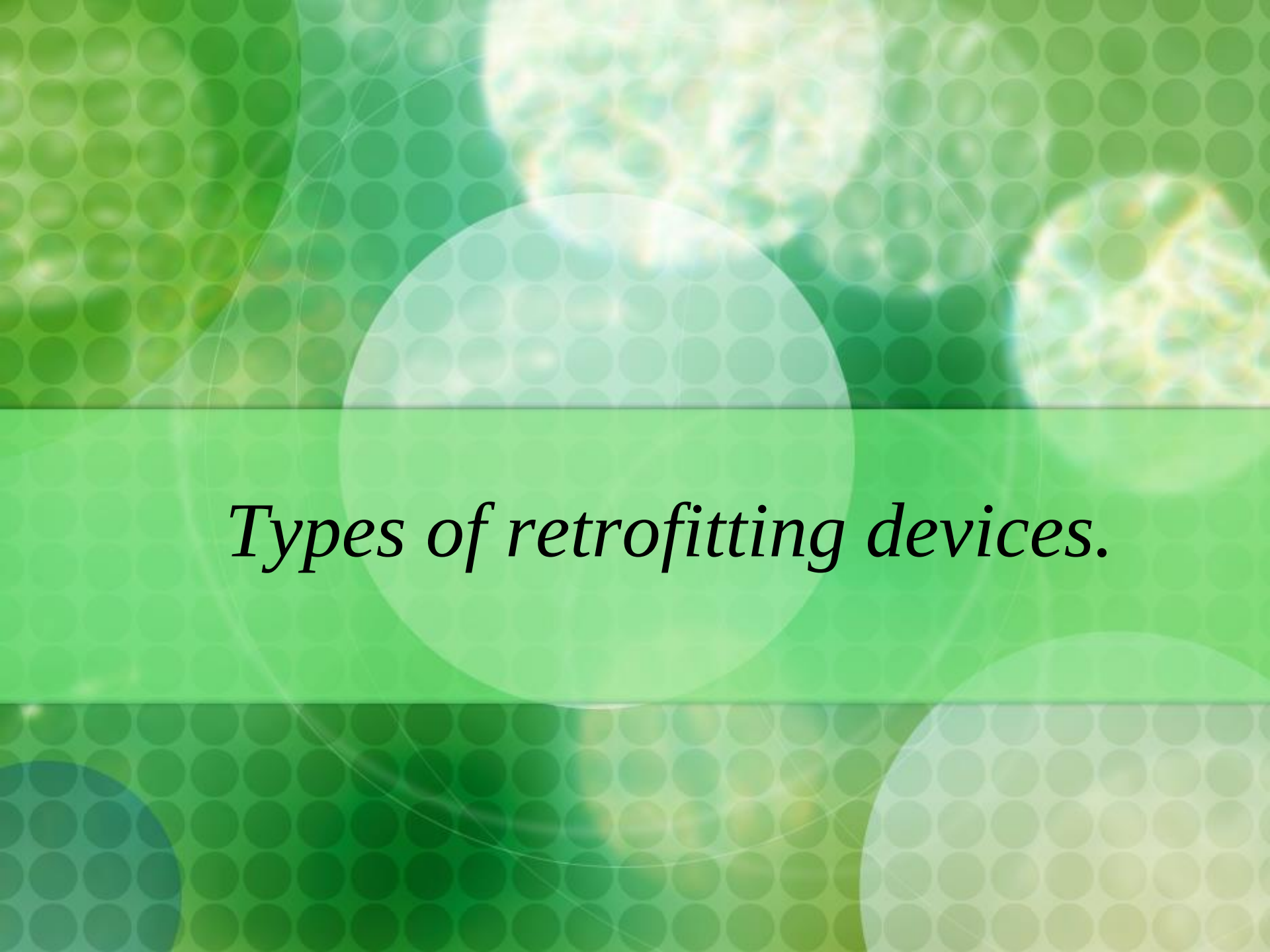
- What is retrofitting?
 - The outfitting of diesel powered vehicles with after-treatment pollution control devices.
- Types of retrofitting devices:
 - DPF
 - DOC
 - SCR

Fact: In 2007 Louisville Metro Schools decided to retrofit 500 buses to decrease their emissions.

Why is retrofitting necessary?

- Air quality is decreasing, therefore becoming hazardous to those with respiratory illnesses.
- Current emissions are:
 - causing climate changes
 - Increasing green house gas emissions
 - Increasing the intensity of the suns gamma rays

Fact: United States alone emits about 21% of the entire World's PM 2.5.

The background is a vibrant green with a pattern of small, overlapping circles. A large, semi-transparent white circle is centered on the slide, serving as a backdrop for the text. The text is written in a black, italicized serif font.

Types of retrofitting devices.

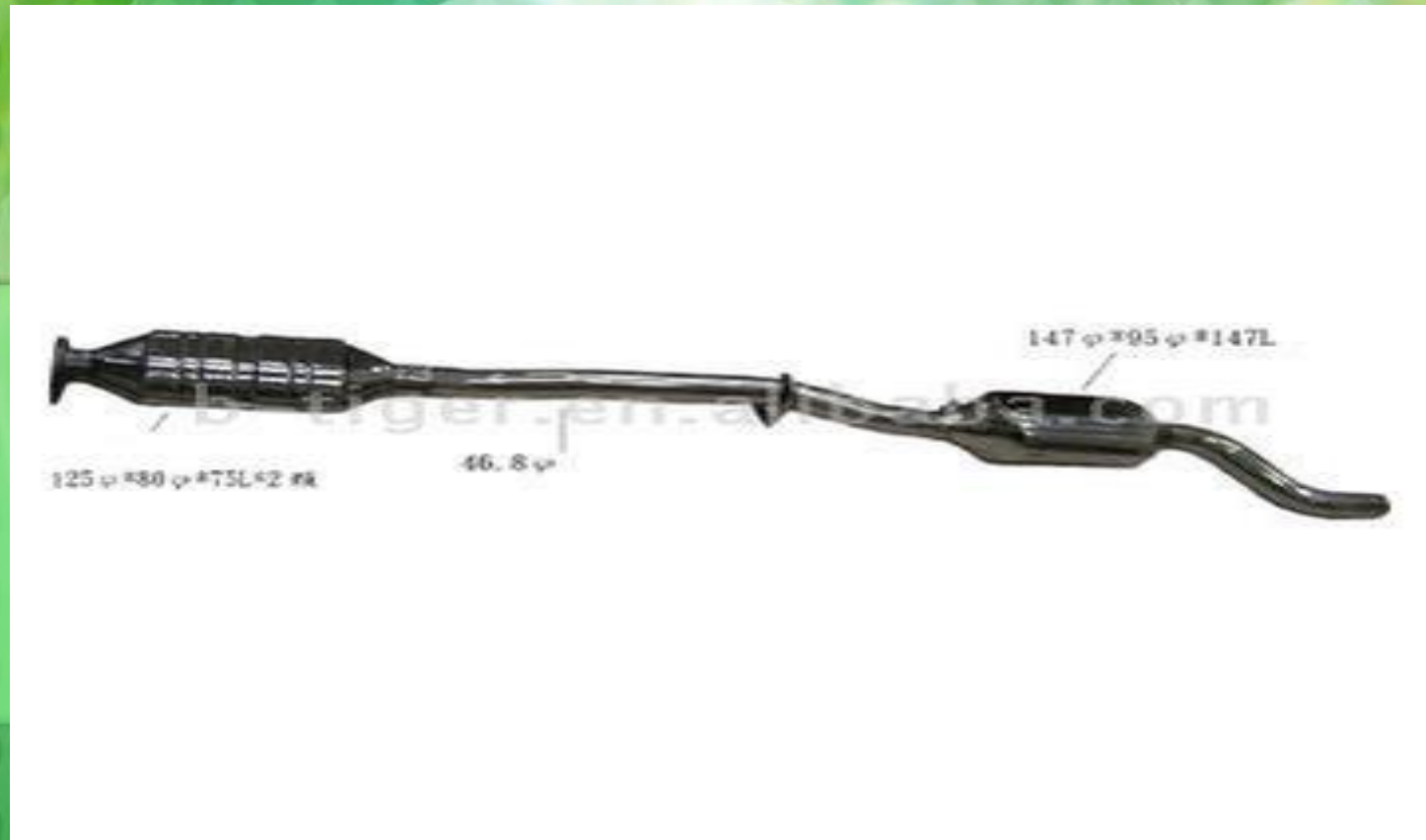
Diesel Particulate Filter (DPF)



Diesel Oxidation Catalyst (DOC)



Selective Catalytic Reduction (SCR)



The background consists of a repeating pattern of small green circles. Overlaid on this is a large, semi-transparent light green circle in the center. Inside this central circle is a smaller, semi-transparent circle containing a stylized image of the Earth (a globe).

Biodiesel

Biodiesel

- Biodiesel can be manufactured from filtered natural oils.
- It can be blended with any concentration of conventional diesel.
- Can be used in any compressed-ignition diesel engine.
- 100% Biodiesel is:
 - Non-toxic
 - Biodegradable
 - Free of Sulphur

How much can it save?

- Current Diesel prices are \$2.58 a gallon (average)
- Comparably, you can make Biodiesel for about \$0.70 per gallon.
- You can save \$1.88 per gallon.
- A Biodiesel Processor (for producing large amounts of Biodiesel) costs \$ 3,495.00.
- A processor will pay for itself in less than 1861 gallons.

How much can it save? (cont.)

- With a B25 mix (for 40 gallon tank)
 - 30 gallons of diesel (\$ 54.41)
 - 10 gallons of Biodiesel (\$ 7.00)
 - \$ 61.41 for a full tank
 - \$ 103.20 all diesel (\$ 2.58/gallon)
 - Saves \$ 41.79 per fill up
 - Will save \$ 2,173.08 a year with one fill up per week.
 - [Biodiesel Comparison Spreadsheet](#)

Environmentally Friendly

- B25 can reduce emissions of:
 - CO (Carbon Monoxide) up to 58.9%
 - CO₂ (Carbon Dioxide) up to 86%
 - NO (Nitrogen Monoxide) up to 37.5%
 - SO₂ (Sulphur Dioxide) up to 57.7%
 - NO₂ (Nitrogen Dioxide) up to 81%

Transportation emissions

Fact: The United States emits 26% of the World's CO₂.

Carbon Dioxide Emissions Chart

What it can do for the community

- Application of non-idling policies, pollution control devices, and the usage of Biodiesel can:
 - Reduce air pollution and carbon emissions
 - Improve air quality
 - Lower allergens in the air
 - Reduce risk of asthma attacks
 - Reduces possibilities bronchitis and pneumonia

Business Ties

- Pollution Control Devices:
 - Could bring business to auto part stores or to independent sellers.
 - Could also start a garage to put parts on vehicles.
- Biodiesel distribution:
 - A student organized club could create the Biodiesel and sell it back to the school.
 - Could also sell Biodiesel to others who wish to purchase our proposed product.

Why does it matter?



Conclusion



Sources

- http://www.edf.org/page.cfm?tagID=22292&source=ggad&gclid=CPT549GsspsCFQLixgodR3_UQQ
- <http://www.mass.gov/dep/air/community/schbusir.htm>
- http://epa.gov/cleanschoolbus/idle_fuel_calc.htm
 - <http://www.epa.gov/cleanschoolbus/>
 - <http://www.meatandfacts.org>
- *All images were provided through Google images.*

The background is a vibrant green with a repeating pattern of small, semi-transparent circles. In the center, there is a large, semi-transparent globe showing a blue and white map of the Earth. The text "The End" is written in a large, black, serif font, slanted diagonally upwards from left to right, positioned over the globe.

The End