Environmental Case Study
Northeast
Regulating Car Idling to Control Air Pollution

Introduction

Long, cold, and snowy winters are a fact of life in the northern Atlantic states and provinces of North America. Most people feel no hardship with these living conditions. The harsh winter condition is something that the local people have grown accustomed to. Mild summers and low air conditioning bills are wonderful benefits of living in this area. However, winter living brings with it additional bills to keep the car and house running normally.

Keeping automobiles running properly in the winter months is a very serious concern. Cold temperatures compounded by brutal winds can make it impossible to start a car. First, the cold temperature will thicken the radiator fluids and engine oils. A car with no protective antifreeze in the radiator will freeze the radiator fluids solid. This will ruin the entire cooling system and even crack the engine block. Thick engine and transmission oils make it very difficult for the parts to rotate. Plus, the thicker oils may not be able to reach all the parts that need lubrication.

A major consequence of the cold weather on cars is that the car is very difficult to start. The starter motor has a difficult time cranking an engine with thick fluids. This makes the battery work much harder and longer. Thus, it shortens the life of the battery. Once the engine is started, the thickened oils do not do a good job lubricating the engine. This wears out the engine prematurely. Usually it is not a good idea to drive the car in cold weather once it has been started. The oils will not be able to lubricate the engine leading to possible locking up of the engine. Irreversible engine damage can occur.

Remedies for dealing with cold weather starting problems for cars are creating a controversy in northern Atlantic states and provinces. Some strategies for protecting the car from excessive winter wear-and-tear may have negative impacts on the environment. However, in many situations it is not possible to follow procedures that reduce environmental decay. But, the growing decline in air quality on the eastern American and Canadian border may force regulations that require people to use mandated ways of keeping a car running during the winter.

Background

Global Climate Change

The City of Toronto produced a Clean Air Consumer Guide in 2002 quoting governmental statistics stating that at least 12% of total greenhouse gases are due to automobile exhaust. This accounts for 2.35 kg of carbon dioxide for each gallon of gas burned in an efficiently running car. All the operations needed to put gasoline into a car, including oil refining and distributing the petroleum, contribute to 20% of the total global climate change. Global climate change, which was once known as global warming, is an effect on the Earth’s climate caused by atmospheric carbon dioxide also called a greenhouse gas. Carbon dioxide in the atmosphere acts as a blanket that traps heat on the Earth’s surface. Thus, a buildup in carbon dioxide creates an effect that heats up the Earth. This heating has several effects on the Earth’s climate.

One effect of global climate change is the heating of areas having ample sunshine. It is believed the northern interior regions of Canada and the United States would become significantly warmer. This may be accompanied by unusual rain patterns that can produce hot, dry summers and temperate, wet winters. So, summer droughts and winter flooding may become normal weather patterns. Coastal regions in the north may become cooler with increased cloud
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cover from oceanic heating. This may shorten agricultural growing seasons and increase the amount of snow falling in the winter. Spring flooding from the melting snows could also be a problem from global climate change.

Another effect of global climate change is the heating of oceans and the melting of polar and mountain ice. Oceanic heating is already evident and creating unusual climatic patterns called El Niños and La Niñas. These weather patterns are caused by unusual temperature changes to mid-ocean waters. They have the potential to produce severe drenching rainstorms in some areas and drought in others. There is also evidence that the change resultant oceanic heating can change ocean currents influencing weather of the northern Atlantic states and provinces. This may create more severe winter storms bringing high winds and deep snows.

The melting of glaciers and ice caps in the poles and on mountaintops may produce coastal flooding if not abated. Plus, it may weaken the permafrost soils and alter the ecology of northern regions. The permafrost is essential for maintaining the unique biodiversity of northern regions. Without the permafrost southern animals and plants will invade the region killing off the native northern species.

Scientists have compelling evidence that global climate change is affecting the climate today. Research shows that global temperatures have risen over the past thirty years. This correlates directly with rising atmospheric carbon dioxide levels. The sixteen warmest years ever recorded since 1880 have taken place after 1980. Scientists suggest that this erratic rise in temperature has caused unparalleled crop losses as recorded by the United Nations World Health Organization. Plus, the rise in El Niños and La Niñas, the more severe winters in the northeast, and the unprecedented glacial melting indicate global climate change origins.

Winter Automobile Strategies

Protecting a car during cold winters is not a simple task. Improperly maintained cars can break down easily in the cold even though they were tested to operate in frigid temperatures. First, people have to keep a fully charged battery in the car. Cold slows down the battery’s output. Plus, the difficulty of starting a cold engine drains the battery much more than warm-weather starting. Cars usually need fresh oil in the engine. The extreme changes in temperature between a cold and hot engine accelerate the breakdown of the oil. Older oils may lose their effectiveness and prematurely wear out the engine. In some cases thinner oil is needed so there is less need for warm-up and so the oil flows better under the cold conditions. In humid areas, people are wise to add gas line antifreeze to prevent any water in the gas from turning to ice and clogging the fuel system.

It is traditional in northern climates to warm up a car to proper operating temperatures by letting the engine run idle. Older cars had a warm-up indicator light that turned off when the engine was at operational temperature after idling. Idling means running the engine for several minutes until it appears the car will run without stalling or making unusual noises. The noises mean that the oils are not adequately lubricating the engine or transmission. Warming up the engine heats up the oils which makes the oil thinner and more effective in the cold. Therefore, metal parts are not directly rubbing into each other and causing premature wearing out of the engine components. Many people also run the heater to make the inside of the car a comfortable temperature. It is dangerous as well as uncomfortable to have the inside of the car too cold. Water vapor from the breath can condense as ice on the inside of the windows making visibility poor.
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There is another way to combat winter when starting up a car. Many people use an engine block heater. The engine block heater is an optional device that warms engine oil without having to run the car engine. Engine block heaters are low voltage heating elements that are inserted into the engine's oil reservoir. The device is usually down by the oil fill spout and it plugs into a regular electrical outlet. Simple ones start heating the oil when they are plugged in. Elaborate engine block heaters have a timer that turns on and off the heater at programmed times. Usually, it takes about two hours to heat up the engine so idling is not necessary. Many northern regions have electrical outlets in the streets and in parking lots so people can hook up their engine block heaters when parked in the winter.

The government of Alaska came up with a plan in 2002 to provide engine block heaters inexpensively to Alaskan residents. This plan was part of energy conservation program by the Federal Highway Administration. For $25 people could get the engine block heaters at authorized service stations. Over 800 heaters were installed the first year of the program. It is difficult to tell if this voluntary program will attract a large enough amount of people to make an impact on the environment. The state plans to continue the program until public interest diminishes.

Many municipalities see another option to cold weather idling. They want people to abandon driving their individual cars in favor of carpooling and public transportation. The United States Environmental Protection Agency and the Canadian government have incentive programs for companies that encourage people to commute in carpools. Many cities in Canada and the United States have to provide public transportation to reduce traffic. Less traffic means not as much gas consumption, a reduced amount of air pollution, diminished wear and tear on roadways, and a reduction in global climate change.

The Issues

Many conservation groups in Canada and the United States see a need to conserve petroleum usage. Plus, the national and provincial governments of Canada are highly recommending energy conservation practices for businesses and households. Their concerns serve two purposes: 1) reduce petroleum resources to protect dwindling reserves, and 2) slow down global climate change from carbon dioxide emissions. Engine idling is a particular concern to areas trying to protect air quality. An idling engine produces 50 to 100 more emissions than a warm engine. Plus, cars get the worst gas mileage when idling cold or warm. Gas is being burned for no forward motion.

Conservation groups believe the governments are not doing enough to reduce pollution. They want to see regulations banning practices such as engine idling. These groups are pushing for laws that ban idling of school buses and taxis, as well as private automobiles. Proponents of the engine idling ban not only argue idling contributes to global warming, but they have data showing how it contributes to ground level ozone and other pollutants that cause respiratory damage. Some groups even cite that these pollutants contribute to allergies and asthma in children.

Not everybody is against engine idling. There are people who argue that it is just as wasteful to use engine block heaters. They see little evidence supporting that the engine is heated enough to significantly reduce idling time. Plus, they recognize that two hours of heating a car with an engine block heater also uses energy to produce the electricity. Other people are distasteful of regulations that control their use of the car. They do not want to be penalized for actions that they feel are not absolutely wrong. The idling issue is just one component of their argument. They do not want to be coerced to carpool or take public transportation.
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References

Literature


Websites

1. Alberta Reduce Vehicle Idling Campaign http://www.prairie.sierraclub.ca/idling/
2. Canadian Automobile Association http://www.caa.ca
4. United States Environmental Protection Agency http://www.epa.gov

Key Principles

1. Air quality regulations
2. Air pollution
3. Automobile emissions
4. Global climate change
5. Greenhouse gas

Ethical Considerations

1. How would laws that prohibit engine idling affect the progression of global climate change?
2. What are the rights of the government to mandate that businesses and cities install outlets for engine block heaters?
3. What are the environmental benefits and costs of using engine block heaters to warm up a car?
4. What are the personal benefits and costs of using engine block heaters to warm up a car?
5. What rights should people have in determining how to operate and take care of their cars?

Civic Engagement & Service Opportunities

1. Volunteer for a local community group involved air quality issues.
2. Write or e-mail your local politicians about automobile, bus, and truck idling in your area.
3. Form a student group having an environmental protection mission.
4. Set up a public forum at your school discussing the possible impacts of idling for your area.
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Learn more about community service as part of your educational enrichment by visiting the following websites: http://www.learnandserve.org/, http://www.servicelearning.org/.

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