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ECON 4545 Final

Question:

Wilma lives in Wyoming and has driven the same car since 1975. Wilma drives 200 miles per week and does not care about the environment at all-in fact, she believes global warming is a made up phenomenon used by the government to justify more regulations.

Her older sister, Lucy, lives in Los Angeles and drives her 2014 BMW 400 miles a week. Lucy also has an old clunker from 1975 in her driveway that she never drives.

Their third sister, Beatrice, lives in Boulder and drives an electric car. Beatrice loves the environment and is a professor in the Environmental Studies Department at CU-Boulder.

Which sister is contributing the most to mobile-source pollution levels? Would a “Cash for Clunkers” program be an efficient way to get the sisters to reduce their emissions? If not, what would be a better way to do so?

Answer:

We cannot be sure about which sister is contributing most to mobile-source pollution levels.

At first it might seem like Wilma is causing the most damage because she drives an old clunker. Old clunkers pollute way more than new cars because emission standards for new vehicles have gotten stricter over time and because emission rates increase as a vehicle ages and is not maintained. However, the fact that Wilma lives in Wyoming is very important. There are barely any people in Wyoming so there is effectively no mobile-source pollution. In populated areas exhaust emissions cause externalities, but in Wyoming there is very little traffic or congestion so very few people are being harmed by Wilma’s clunker. However, one area where Wilma is negatively impacting air pollution levels is with respect to CO₂ emissions. CO₂ is a heat trapping gas, so its effects on global warming are felt equally not matter where it is emitted.

Because Lucy drives a new car it might seem like she is contributing much less to pollution levels than Wilma. Lucy’s 2014 car would have been subjected to stricter CAFE standards that now require cars to have better MPG, so her CO₂ emissions will be lower per mile driven than Wilma. However, Lucy drives twice as far per month as Wilma, so depending on her BMW’s MPG she might be contributing to global CO₂ levels just as much as Wilma. This illustrates one of the shortcomings of CAFE standards-they do not encourage drivers to reduce pollution by driving less. Also, since Lucy lives in Los Angeles, the emissions from her car are causing negative externalities to a far greater extent than are those from Wilma’s car. Los Angeles is very crowded, so Lucy’s emissions are greatly contributing to pollution and congestion levels in the city.

Beatrice from Boulder might seem like the sister who is polluting the least because she has an electric car; however, it is important to consider materials balance. The electricity to run her car is not simply coming from nowhere. The electricity is most likely produced in a coal-powered plant which is emitting CO₂ and other pollutants.

So in summary, we cannot be sure who is contributing the most to mobile-source pollution levels because each sister lives in a different place and has different circumstances.

A “Cash for Clunkers” program would not be an efficient way to get the sisters to reduce their emission levels. The point of these programs is to get old, heavily polluting cars off the roads and replace them with new cars with better emission standards. There are many drawbacks to this type of program that the scenario with the sisters illustrates. First off, Lucy’s situation demonstrates how this type of program could actually *increase* emission levels. If Lucy were to trade in her clunker that sits in her driveway and never gets used she might take the credit and buy her 16-yr-old daughter a car. This new car would emit more pollutants than the old clunker ever did sitting in the driveway. In Wyoming, Wilma might also decide to trade in her old clunker, but since she is not really contributing much to the pollution problem in the first place, her switching cars will not do very much to help solve it.

The main problem with programs like “Cash for Clunkers” is that they are an indirect way to address emission levels. Although such a program might reduce emissions to some degree, it is not the most efficient way of doing so. There are other ways of reducing emissions that will more directly and more successfully address the issue. The best way to reduce mobile-source pollution would be a pollution tax. This method would allow drivers the flexibility to choose their own cost-minimizing way to reduce emissions and would probably involve some combination of driving less, driving a less-polluting car, maintaining their car better, driving a car with better MPG, or buying fewer goods whose production involves a lot of pollution.

Explanation:

This would be a good question for an exam on mobile-source pollution because it incorporates many different topics and issues. The question and its answer reference: the different impacts of driving in lowly/highly populated areas, the global issue of CO₂ emissions, CAFE standards, materials balance, emissions from old/new cars, “cash for clunkers” programs, negative externalities, and pollution taxes.