PAI 777 **Professor David Popp**
The Economics of Environmental Policy **Spring 2024**

Take Home Quiz #2
DUE AT THE BEGINNING OF CLASS ON WEDNESDAY, MARCH 6

This quiz is intended as an individual take-home quiz. Each student is expected to hand in their own work. While you are free to consult with me for any questions you may have, you may not discuss the quiz with other students. E-mail questions about the quiz should be sent to my personal e-mail address (dcpopp@syr.edu), rather than the class listserv. This is an open-book quiz. You are free to consult your notes and the readings from the class to complete the quiz.

Take the time to think before you write. Well-thought out, well-written answers will be rewarded. A direct, concise explanation is better than a five-page treatise. I am not just looking for how much you know, but how well you are able to communicate what you do know, which includes filtering through information to highlight the most relevant points. In addition, pay attention to the target audience. For this assignment, your memo should be accessible to someone with limited economics expertise. Such memos should be written in a professional manner and avoid the use of economic jargon. The assignments page of the class web site links to an article with suggestions for effective professional writing.

The quiz is due AT THE BEGINNING OF CLASS on WEDNESDAY, MARCH 6. Late quizzes give you an unfair advantage over other students in the class. As a result, late quizzes will be marked down one grade for each day late, starting AT THE BEGINNING OF CLASS on WEDNESDAY, MARCH 6. If you will not be in class on Wednesday, it is your responsibility to get the quiz to me BEFORE CLASS, either via e-mail or submitting it at the front desk of the Center for Policy Research. Do not just leave the quiz in my mailbox, as I need to know when you hand the quiz in. There is a sign-in sheet at the front desk of CPR for this purpose.

In the United States, energy efficiency standards for major appliances are required by the Energy Policy and Conservation Act of 1975. These standards set minimum efficiency requirements that must be set for different types of appliances, such as refrigerators, air conditioners, and furnaces. The law requires that the standards be reviewed every six years. The Department of Energy (DOE) is currently performing one of these reviews.

One concern with current standards is that they lack flexibility. All appliances sold in the US must meet minimum energy efficiency requirements. While firms have incentives to produce appliances that meet efficiency standards, the only incentive to produce products that are more efficient than the minimum requirements is if consumers demand them. As a result, we observe "bunching," where many appliances sold in the market have energy efficiency ratings at or just barely above the required levels.

Nonetheless, some products do exceed the standard, as some consumers want appliances that are more efficient. For example, a second government program, the Energy Star labeling program, helps consumers identify energy efficient products. Appliances receive an Energy Star label from the government if their product is 20% more efficient than the minimum standard.

A second concern with current standards is that appliance standards focus on attributes. There are separate standards for natural gas furnaces and heat pumps, which use electricity to provide heat. However, current law prohibits standards that would make existing product types unavailable. Thus, the DOE could not create standards that could only be met by heat pumps, as that would force natural gas furnaces off the market. Similarly, there are different efficiency standards for different types of refrigerators, based on characteristics such as size and freezer placement, but not an overall standard for the efficiency of refrigerators more generally.

To assist with the DOE's review of appliance standards, you've been asked to consider alternatives to command-and-control performance standards for appliances. You have been presented with two alternatives to consider.

- "*Feebates*": Feebates combine an environmental tax with a subsidy for above average performance. The policy begins by setting energy efficiency standards, as is now the case. When firms sell appliances with energy efficiency ratings worse than the standard, they pay a fee per unit sold. Similarly, if they sell an appliance with an efficiency rating better than the standard, the firm receives a rebate from the government. Thus, not all models must meet the standard, and firms are rewarded for selling products that exceed the standard. Fees and rebates would be proportional to the amount of over or under compliance. For example, the fee for selling an appliance 20 percent below the standard would be twice as large as the fee for selling an appliance 10 percent below the standard.
- *Energy efficiency credits*: Energy efficiency credits provide flexibility to firms, allowing them to sell some products with energy efficiency performance below the requirement, as long as they also sell products with above average performance. Products whose energy efficiency rating exceeds the performance standards set by the government generate credits

for the manufacturer. These credits can be traded, either across models within the same firm, or potentially with other firms. An example of a trade within a firm is if a firm sells an air conditioner that exceeds the energy efficiency standards by 10%, they receive a credit that allows them to sell a different model that is 10% below the required standard. By allowing firms to buy and sell credits, similar trades could be made across two different firms.

As an assistant to a US Congressperson, you have been asked to write a 2-4 page (single-spaced) memo briefing the Congressperson on these two policy options. Please provide a brief evaluation of each of these two proposals, and then *recommend whether either of these two policies should be adopted in an effort to reform energy efficiency regulation*. You do not need to recommend one or the other: continuing to use command and control regulations is also an option. Your memo should briefly explain why energy efficiency regulations may be needed, and should consider how each policy option (including command and control) addresses those needs.

Here are some key issues to think about when evaluating each policy:

- What is uncertain under each policy?
  - How well can the government predict the average energy efficiency of all appliances sold under each plan?
  - How well can they predict actual energy usage under each plan?
- How will each proposal affect government revenues?
- How broad should the policy be?
  - If credits are used, should trading across firms be allowed, or only within firms?
  - Should regulations continue to focus on attributes, or should the law be amended to allow regulations about broader categories of goods (e.g. regulations that favor one technology over another)?
- What incentives does each plan provide for innovation? That is, what are the rewards for providing products that are more efficient than required?

Your memo should be written in such a way that it can be understood by a reader with little or no economics background. Please remember to include a recommendation with your evaluation.