

Assignment 3: Case Study II (Abatement and Labelling, Week 3)

Due Date: Wednesday, July 16th, 2025.

During class we discussed CPRs, the informative role of ecolabels and firms' strategic investment in abatement technology.

On one hand, CPRs face the problem of the tragedy of the commons and ecolabels signal to consumers that a firm follows environmentally friendly practices or uses sustainable inputs. On the other hand, abatement technologies are green innovations that help firms reduce pollution.

Using the concepts discussed in Week 2-3, respond to the following questions.

1. CPRs. Answer the following questions.

- a. Provide an example of common pool resources and discuss the tragedy of the commons.
- b. Discuss an example where the CPR is initially operated by an incumbent and it faces the threat of entry. The incumbent has information about the total stock (it can be high or low). However, the entrant does not observe the state of the stock. The entrant must decide whether to enter or stay out. Solve a signaling game (you need to identify the payoffs of both players) focusing on the pooling equilibrium of the game.

2. Ecolabels and signaling. Answer the following questions.

- a. Identify a real-world example of an ecolabel and explain the type of information it conveys to the market.
- b. What penalties might a certified firm face if it fails to comply with certification standards?
- c. What are the sources of uncertainty a consumer might face when deciding to purchase a certified product?
- d. Can climate change influence the signaling effectiveness of ecolabels? Justify your answer.

3. Abatement technology. Answer the following questions.

- a. Provide a real-world example of a firm's investment in abatement technology and explain how it helps reduce pollution.
- b. From the firm's perspective, what are the benefits of adopting abatement technology?
- c. Is there a policy that could encourage the adoption of such technologies? Briefly describe it.

4. **Signaling and certification.** Consider a signaling game between a car company, deciding whether to acquire a green certification, and a representative consumer, observing the certification, and responding buying or not buying a car from this company. The car company privately observes its car's emissions (which can be High or Low), the consumer does not observe this information, however, she observes whether the car company acquires a certification. The car company can be a high type with probability q or a low type with probability $(1 - q)$, where $q \in (0,1)$. The consumer knows the prior probability distribution over types and updates her beliefs about facing a high type, μ .

- Define the payoffs for the car company and for the consumer. Clearly state your assumptions.
- Graphically represent the signaling game.
- Identify a Separating Equilibrium and interpret your results.