

Sai Bravo Megarejo and Carole Haritchabalet: Certification of low-carbon hydrogen in the transport market

Thomas P. Tangerås
thomas.tangeras@ifn.se
Research Institute of Industrial Economics

June 15-16, 2022
13th Conference on the Economics of Energy and Climate

Summary

- Paper analyzes incentives to invest in green hydrogen for vehicles
- Incumbent and one potential entrant with green technology
- Consumers are willing to pay extra for green hydrogen, but can only observe average quality
- What is the value of certification?
- Can firms overcome the asymmetric information problem through vertical integration?

Comments

- The claim that monopoly will supply fossil hydrogen seems incorrect
- Willingness to pay for fossil hydrogen: $v - p_f$
 - Demand $D^f(p_f) = 1$ for all $p_f \leq v$, $D^f(p_f) = 0$ otherwise
- Willingness to pay for green hydrogen: $v + \theta - p_g$, $\theta \in [0, 1]$
 - Demand $D^g(p_g) = \max\{1 + v - p_g; 0\}$ for all $p_g \geq v$
- Profitable to invest in hydrogen if $v < 1 + c_f + d + \gamma$ and

$$\frac{(1 + v - c_f - d - \gamma)^2}{4} - E_\gamma > v - c_f - d$$

Equivalent to

$$(1 - \gamma - v + c_f + d)^2 > 4\gamma(v - c_f - d) + 4E_\gamma$$

Comments

- There is no profitable entry of green hydrogen
- Lemma 1 that the green technology cannot arise under threat of entry seems incorrect
 - If the incumbent has a cost advantage in green technology
 - If the incumbent prefers the green to the black technology

Comments

- Results in Section 4 must be verified
- Results in 4.1 that labeling can solve the problem and that firms then prefer market segmentation (Proposition 1) is quite straightforward
- Most interesting part is the section on vertical integration
 - Which are the fundamental new results?
- Vertical integration is more efficient than labeling
 - Does the model predict such vertical integration (i.e. a prisoners' dilemma)?
- The model may have multiple rational expectations equilibria: Is the interior equilibrium stable?
- Incentives to invest in hydrogen cars?