



Hydrogen Economics



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Recent Research

- Making Markets for Hydrogen Vehicles, Lessons from LPG World Market Development.
- What is the most effective way to get round the “chicken and egg” problem?
- We studied the autogas (LPG) market as it has similarities with hydrogen

Results

| | | | |
|---|-----------------------|--------------|--------------|
| Mean of number of refuelling sites | | 0.29210 | |
| Mean of number of vehicles | | 0.05103 | |
| The vehicles measured by per thousand vehicles in 2005 | | | |
| The refuelling sites measured by the ratio to the total number of petrol refuelling sites in 2007 | | | |
| Regression | Estimated Coefficient | ϵ_v | ϵ_s |
| On vehicles | 0.18659 | 1.0681 | |
| On refuelling sites | 4.4694 | | 0.5307 |

Lessons from LPG

- We found that the number of vehicles responded more to previous changes in the number of filling stations than vice versa
- This is consistent with the World LPG Association's review which found the lack of refuelling stations to be a major impediment for autogas markets taking off to reach a critical market mass.
- Implication: Policy should emphasise support for refuelling stations.

Research in Progress

- ❑ **Comparison of Learning Curves for Future Hydrogen Production Technologies.**
- ❑ **How are the costs of producing hydrogen likely to change over time?**
- ❑ **Compare Steam Methane Reforming (with CCS) against cleaner methods:**
 - **Electrolysis of water with electricity from renewables**
 - **Biomaterial methods**

Research in progress

- **Impact of Electrolysis of Water with Wind Power on the Hydrogen Production Costs and the Price of Power.**
- **How much H₂ could be produced through electrolysis of surplus wind-generated electricity?**
- **What would this cost?**
- **How would it affect the price of power?**

Future Research Plans

- A review of break-even price between gas and electricity in hydrogen production.
- Social and economic costs analysis of district CHP models in China.

Completed Business Assistance

□ Ecolec Ltd.

- **Company background:** *It sells electric heating systems with zonal controls. The wall-mounted, battery-operated controller senses the temperature and signals the nearby heaters to turn on and off. With several controllers, different parts of a house can have different temperatures. The controllers allow rooms to be warm at times when they are likely to be occupied, and to remain colder at other times.*
- **We provided assistance using our knowledge of electricity prices**

Completed Business Assistance

□ Wooler Heating Ltd.

- **Company background: A new company that trades in and installs air source heat pumps**
- **We provided assistance using our knowledge of energy policy and government funding for energy efficiency**