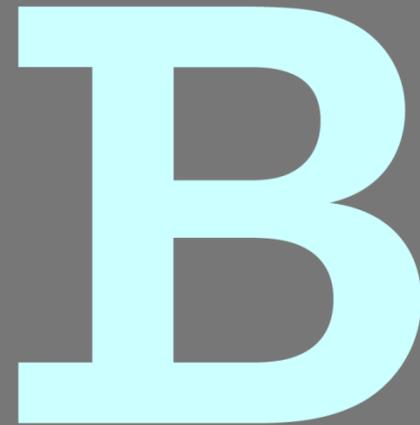




# Hydrogen Economics



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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	$\epsilon_v$	$\epsilon_s$
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 H<sub>2</sub> 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**