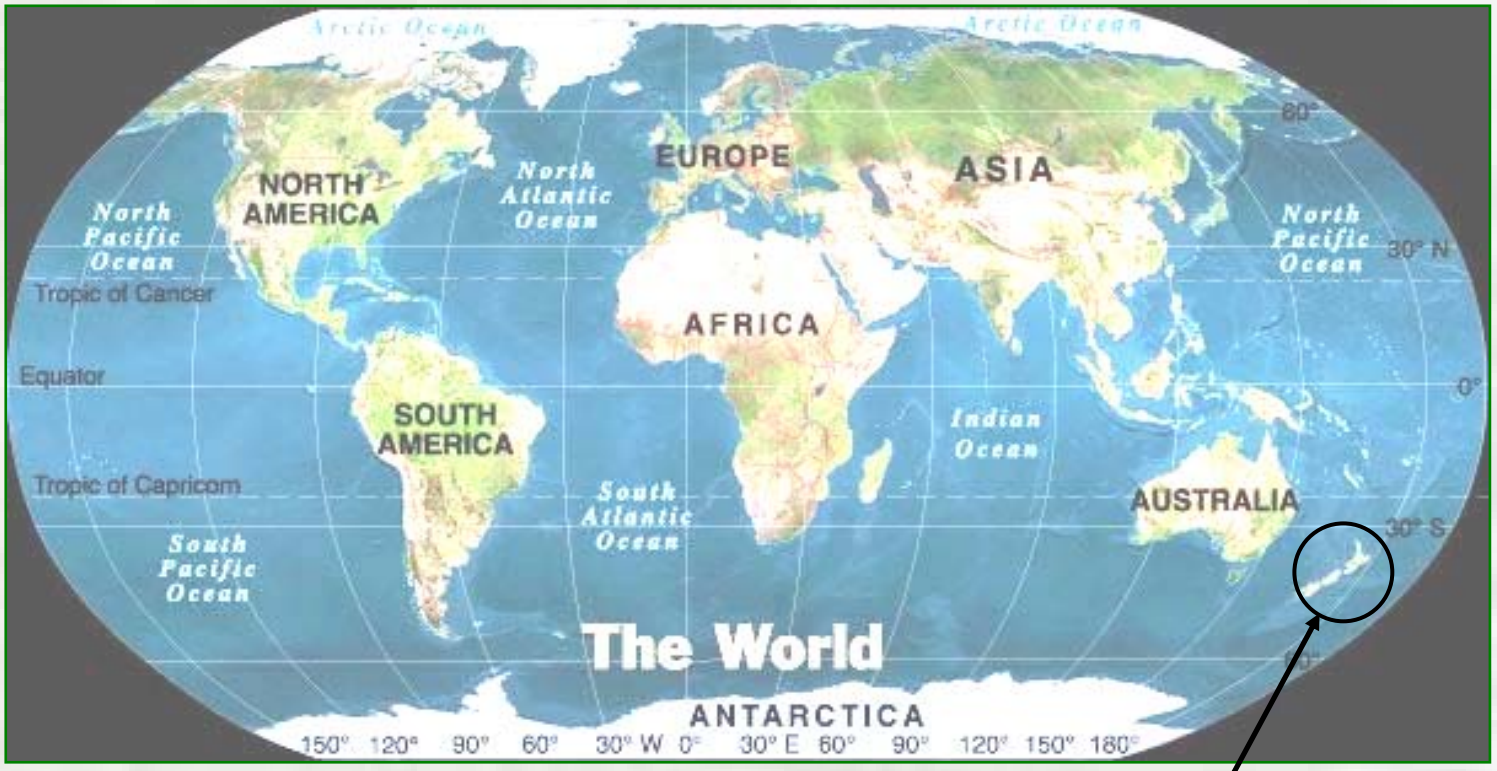
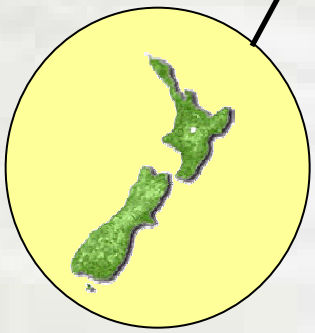
# New Zealand Hydrogen Energy Activities Update – Jan 2006

# Where in the World Are We?



New Zealand

**Population: 4 million**

**Land Area: 265,600 sq km**

**1920 km from Australia**

# New Zealand IPHE Status

- New Zealand membership of IPHE ILC accepted at the Paris SC meeting in January 2005
- The primary New Zealand IPHE contact is:

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- The Ministry of Economic Development is responsible for shaping New Zealand's energy policy

# Hydrogen Research Activities

- Stock take compiled by MED, December 2005
  - Hydrogen Energy for the Future of New Zealand
    - Coal to hydrogen by gasification
    - Renewable electricity to hydrogen by electrolysis
    - Hydrogen to electricity by fuel cells
    - Scenario modeling
  - Thermochemical production from renewable resources
    - Methanol to hydrogen
    - Ethanol to hydrogen
  - Hydrogen Storage
    - Chemical hydrides
      - Regeneration of sodium borohydride
      - Storage in amino-borane systems
  - Hydrogen fuel cell demonstrations
    - Alkaline, PEM, SOFC

# Update on Hydrogen Research Activities

- Two new areas of focus (for NZ)
  - Hybrid solid state hydrogen storage materials
  - Micro-scale electrolyser product development
  - These activities will refocus some of the earlier project work identified in the compendium

# Update on Hydrogen Research Activities

- Hybrid solid state hydrogen storage materials
  - Chemical combination of light metal hydrides (such as $MgH_2$ and ammonia boranes)
  - Goal to exceed Department of Energy 2015 transport target of 9wt%
  - NZ interest is also in possible benefits for stationary applications
  - Collaboration with US LANL and PNNL, National University of Singapore, Oxford University
  - Proposed submission for IPHE storage project status (led by Dr Tom Autrey of LANL)
  - NZ Crown Research Institute, Industrial Research Limited has been awarded 3 year government funding for its role

**Contact:**

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# Update on Hydrogen Research Activities

- Micro-scale electrolyser product development
  - Hydrogen production from intermittent Renewables (wind, solar)
  - Distributed community scale electrolysis
    - Low cost
    - Stand alone operation
    - Variable low pressure hydrogen delivery
    - Tolerant to water impurities
    - Modular
    - Safe
  - Technology specifics
    - Alkaline
    - Simple electrodes
    - Large area

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**Thank You**

***Hydrogen: Karaphiua – Go for it***