

An Update

Geothermal Heat Pumps in Australia



Brian Carey

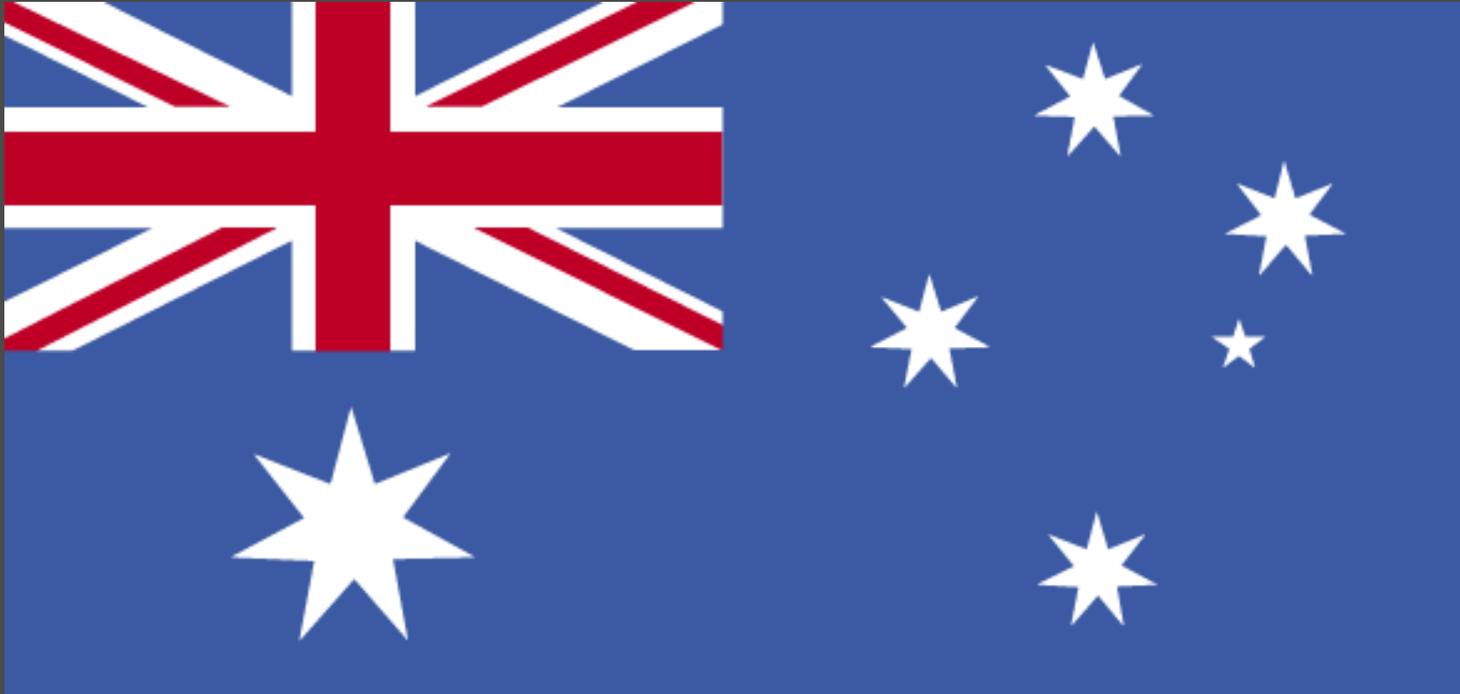
IEA – Geothermal Annex VIII Task A Leader

19th October 2014

AIST Fukushima Workshop

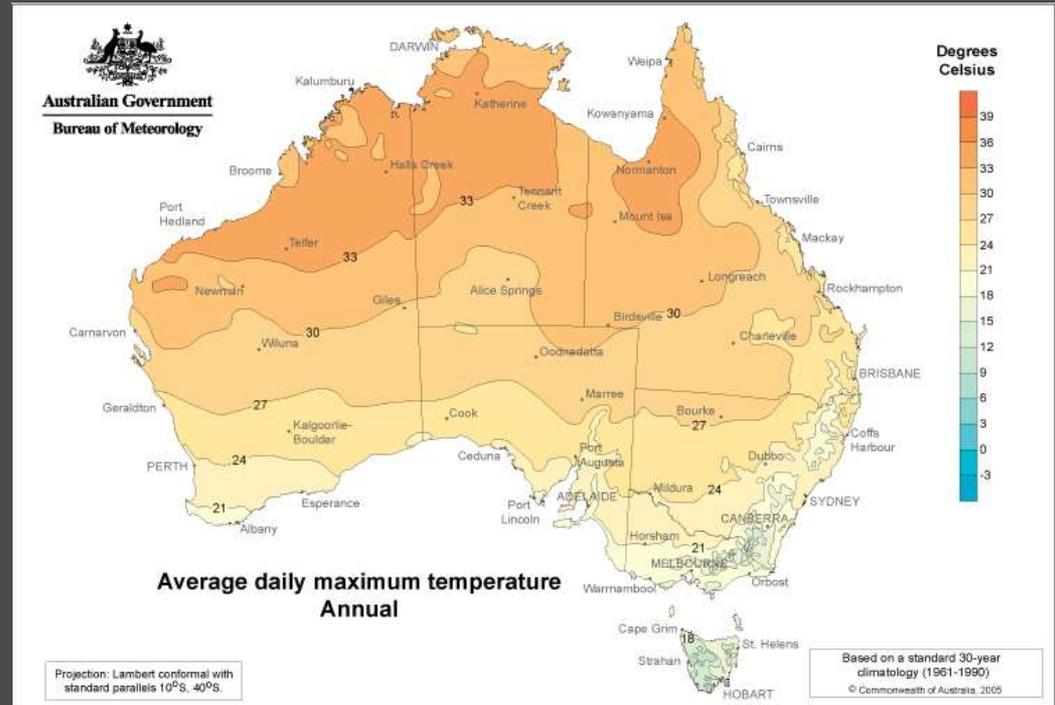


Australia



Australian Snapshot

- **Land Mass:**
7 682 300 km²
- **Population :**
22.2 million
- **Ground temperatures :**
12 – 32 °C
- **Ambient temperatures :**
-15 to 50°C
- **Climate :**
generally arid to semi-arid temperature in south and east,
tropical in North

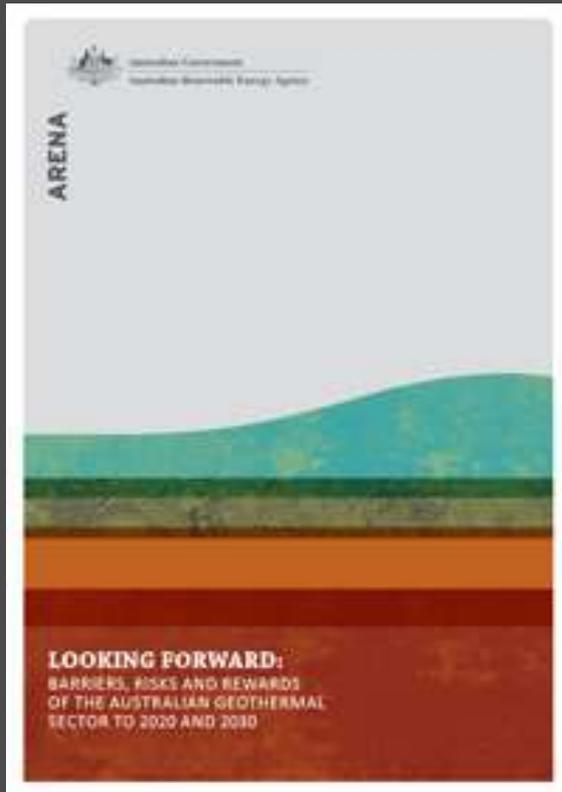


Australia

- 2012 to 2014 looking for more carbon friendly energy solutions
- **Geothermal solutions were part of this**
 - Engineered geothermal systems
 - Sedimentary aquifers
 - Geothermal heat pumps
 - District heating and cooling schemes
- **Tony Abbot's government repealed carbon pricing on 17th July 2014**
 - Playing field shifted - pricing tool now lost for 5 years ?
- **The Australian Renewable Energy Agency (ARENA) continues to be funded**



Australian Renewable Energy Agency (ARENA)



Board of ARENA asked an international geothermal expert group for options to realise the potential of geothermal in the coming decades

“The report sets out the steps for developing an innovation roadmap for harnessing the potential of geothermal energy in Australia.”

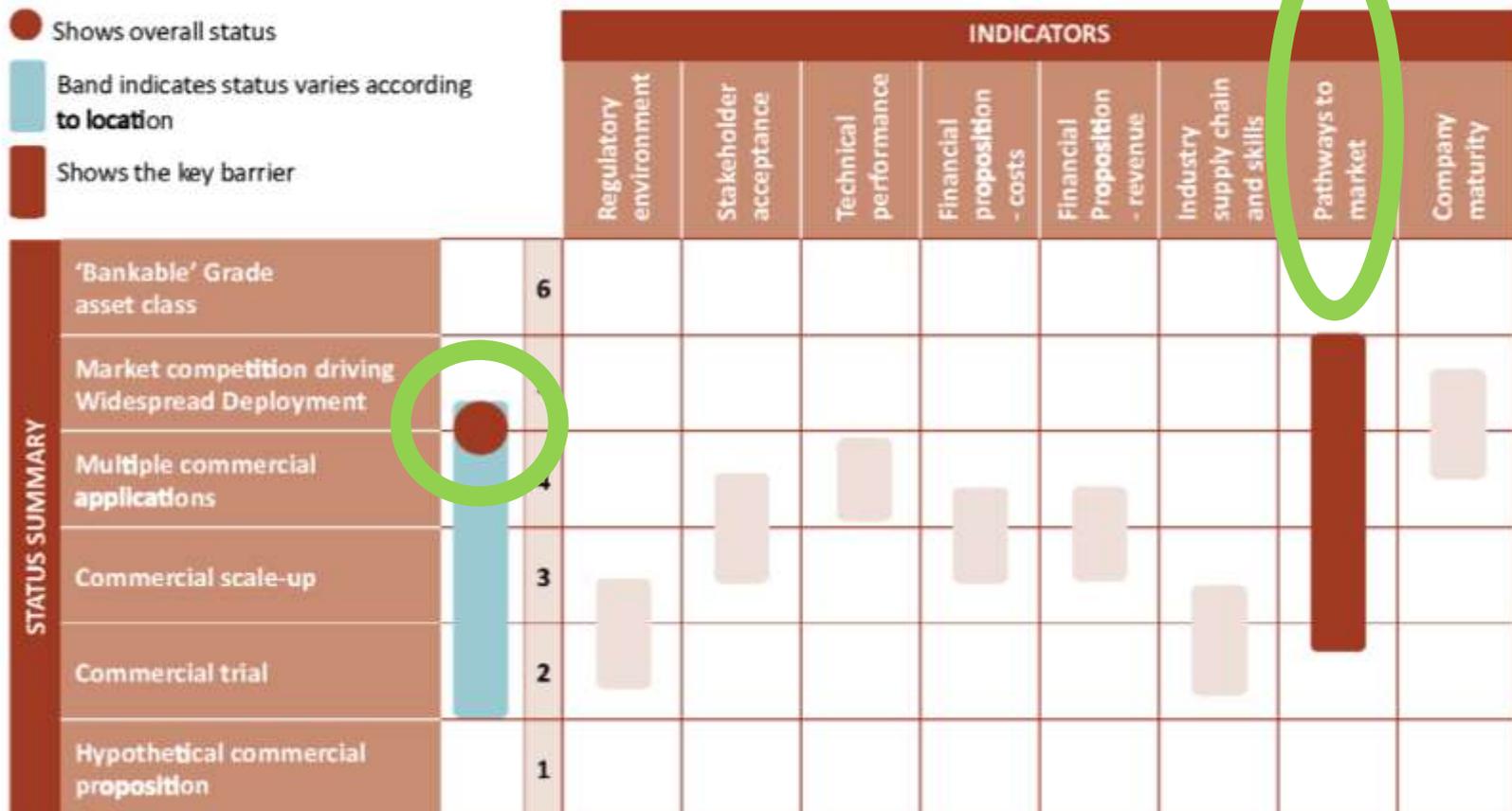
<http://arena.gov.au/files/2014/07/ARENA-IGEG-main-report.pdf>

Geothermal Power Generation

- **Geothermal power sector is stalled**
 - Little activity in Australia
 - Proponents unable to attract funding
 - Not market ready
 - Unlikely to be for a number of decades
- **South Australian Centre for Geothermal Energy Research (U of Adelaide)**
 - Funding from South Australian Government and ARENA
 - Active research program in subsurface fracture characterisation, fluid – rock interaction and determination of reservoir permeability ahead of drilling

Shallow Geothermal Direct-use resources Commercial Readiness Index

The technology for Shallow Direct-use resources is well advanced, as demonstrated by the projects established in Perth and Victoria: costs are well known and the resource is well understood.



Direct Geothermal and Heat Pumps

- **Growth in residential and commercial sectors**
- **Size 10 to 2500 kW**
- **> 50% energy savings over conventional energy solutions**
- **IGSHPA**
Australasian GSHPA
2013



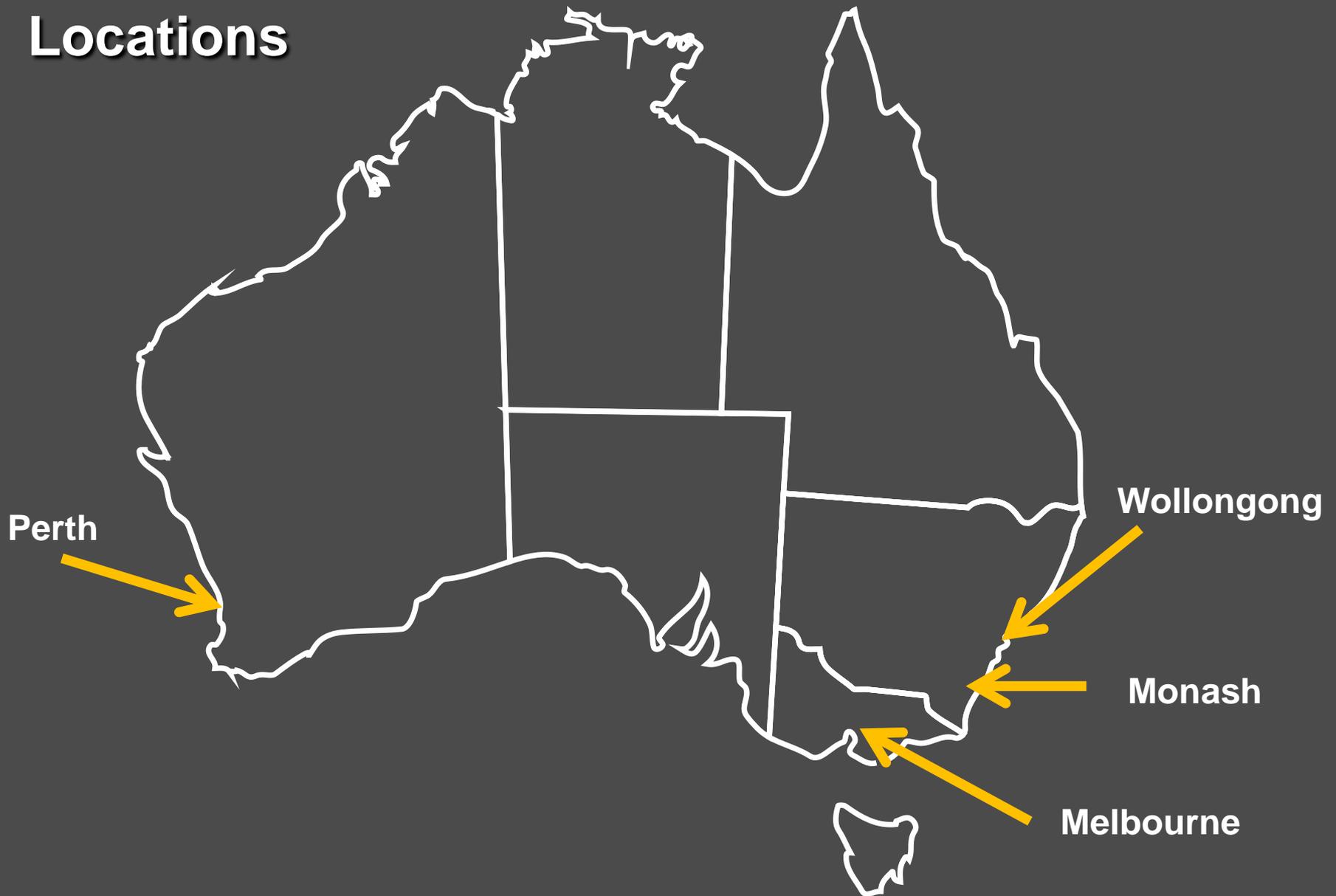
Photos from geoexchange web site <http://www.geoexchange.com.au/commercial-case-studies/>

Australian Universities and GHP Research

- Melbourne
- Monash
- Wollongong
- Perth



Locations



Melbourne University - Research

- Cooling and heating
- Ground Heat exchangers (GHE)
- Investing in GHE instrumentation and monitoring
- 3D modelling of GHE and Energy Piles
- Improved analysis
- Cost effective designs

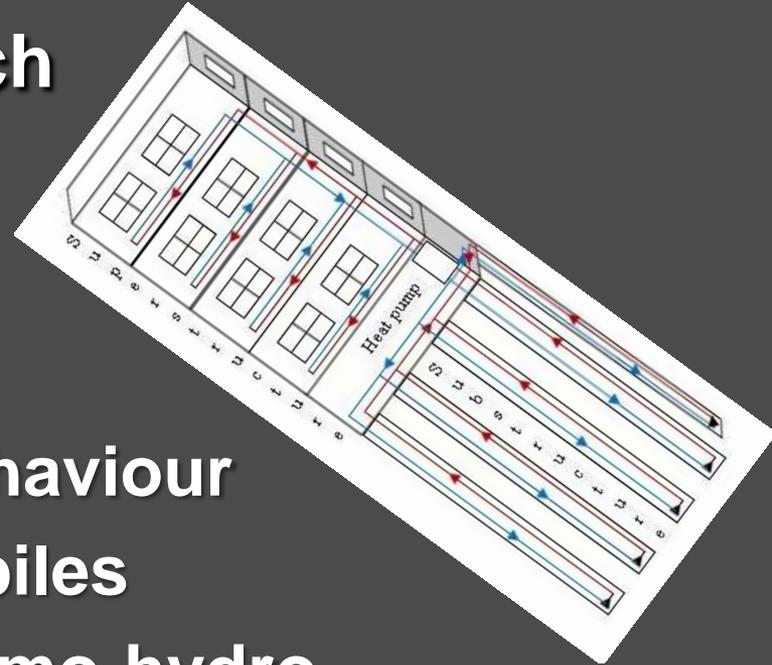
Web site <http://eddge.com.au/about/>

Publications <http://eddge.com.au/publications>



Monash University - Research

- Soil thermal properties
- Soils thermo-mechanical behaviour
- Field tests of geexchange piles
- Numerical simulation of thermo-hydro-mechanical processes in geexchange piles
- Cost benefit analysis of using geexchange piles in buildings



Wollongong University – Energy Research

- Sustainable Building Research Centre
- Develop prototype and test sustainable building technology
- Experimental and theoretical analysis of building design
- Energy efficiency training for engineers





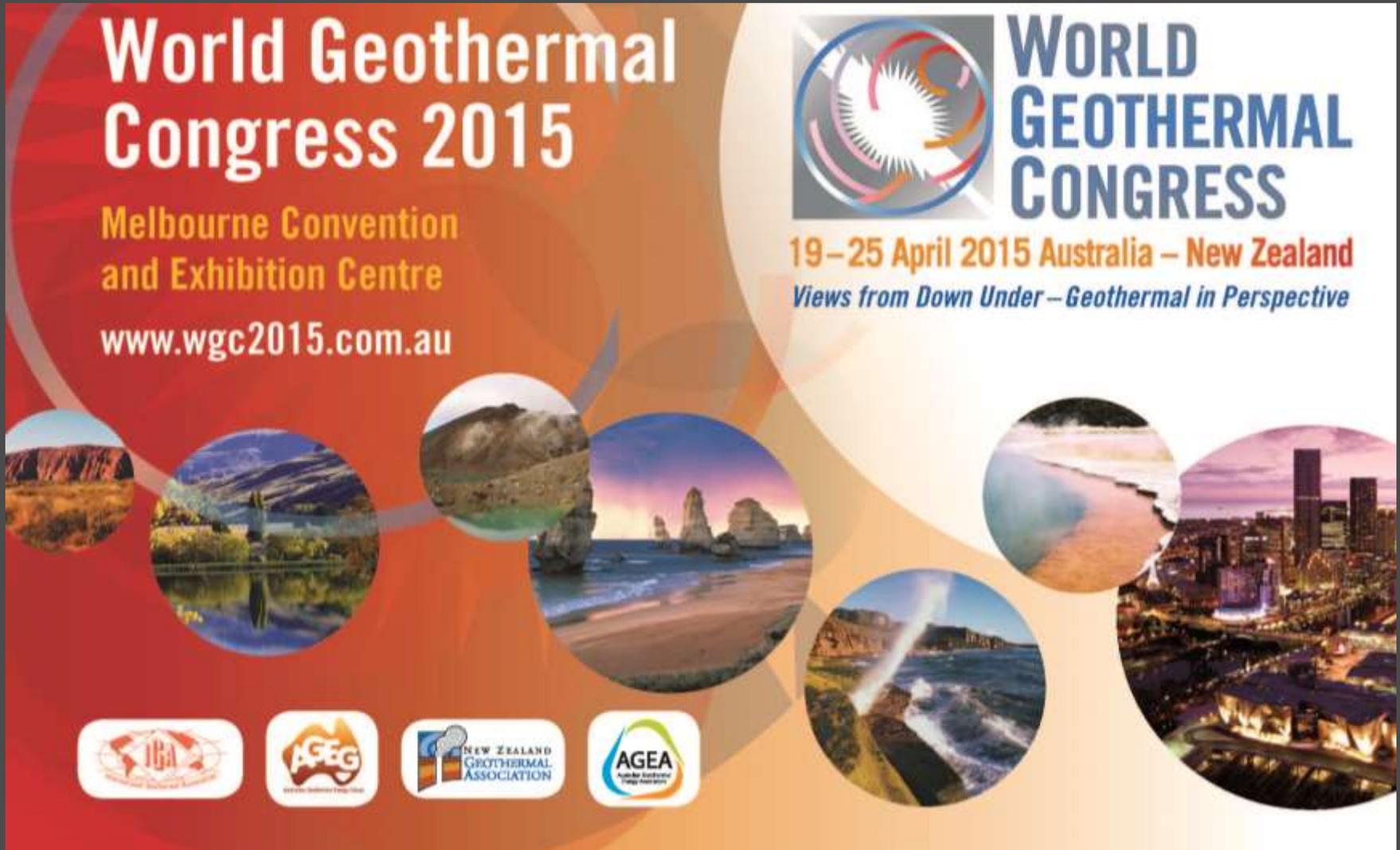
Direct Geothermal Field Projects at
The University of Melbourne
Victoria, Australia

Program Leaders:
Professor Ian Johnston and Dr Guillermo Narsilio

October 2014



Information and advertising



World Geothermal Congress 2015
Melbourne Convention and Exhibition Centre
www.wgc2015.com.au

WORLD GEOTHERMAL CONGRESS
19–25 April 2015 Australia – New Zealand
Views from Down Under – Geothermal in Perspective

The banner features a central graphic of overlapping circles containing various landscape and geothermal images: a desert canyon, a lake with mountains, a rocky coastline, a beach with rock formations, a geothermal vent, a coastline, and a city skyline at night.

Logos at the bottom include:
- IGA (International Geothermal Association)
- AGEG (Australia Geothermal Energy Group)
- NEW ZEALAND GEOTHERMAL ASSOCIATION
- AGEA (Australia Geothermal Energy Association)

Geothermal Associations of Australia and New Zealand

Welcome you to Melbourne

1359 papers

10 technical sessions + Keynote sessions

IEA – Geothermal represented

Pre-congress Short Courses (2 & 3 Days)

To be held in Melbourne

Geothermal Well Drilling, Completion and Testing (2)

Scaling and Corrosion in Geothermal Development (2)

Reservoir Engineering (2)

Electricity generation from low temperature geothermal resources (2)

Reducing Drilling Risk (3)



Post-congress Short Course (3 Days)

To be held in Taupo, New Zealand

Geothermal Policy and Implementation

– The New Zealand Example



Four post-congress Field Trips

To be run in New Zealand

1. Powerful landscape
2. Glorious geothermal energy
3. Northern escape
4. Lord of the rings and hobbits middle earth adventure

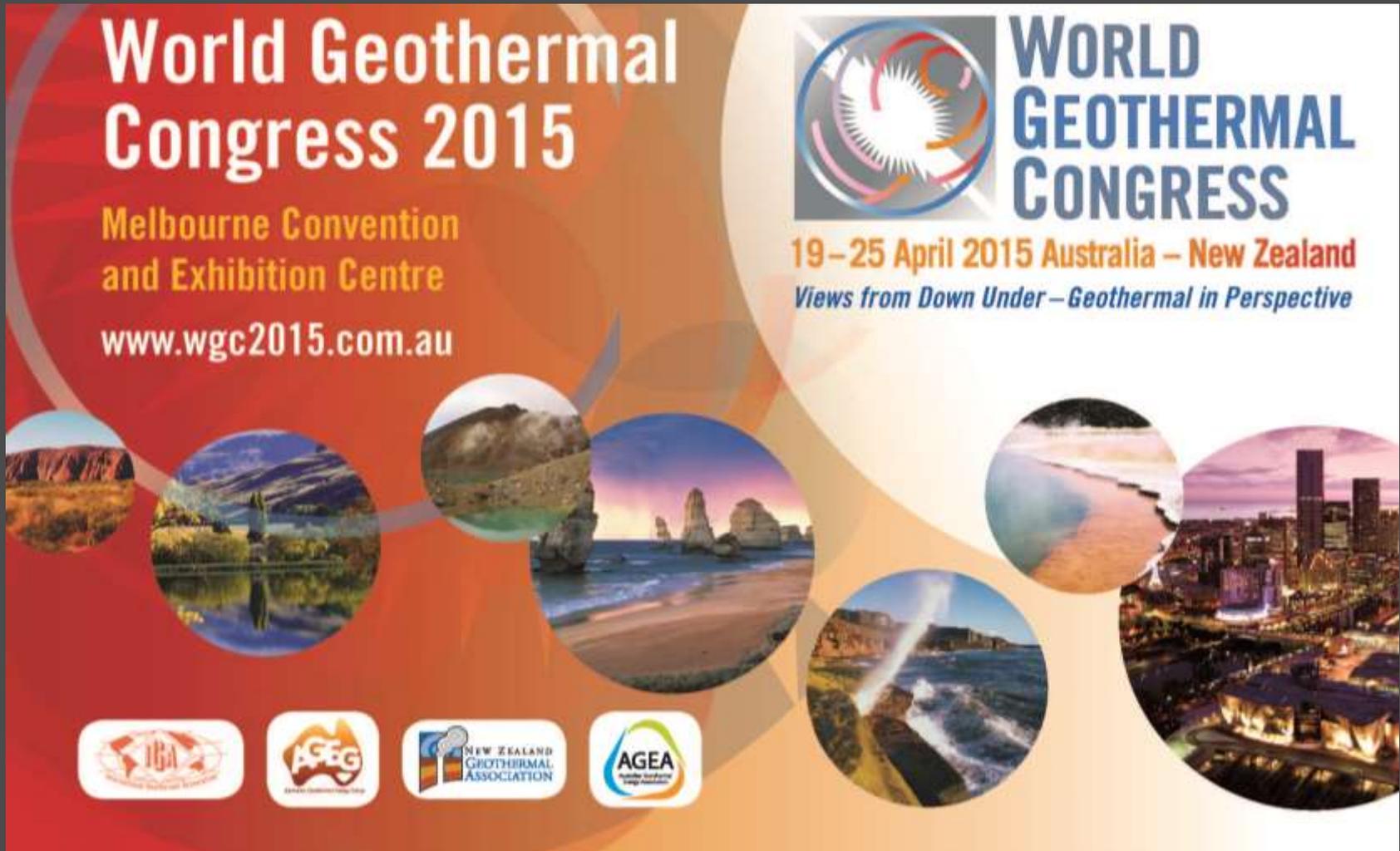


Come to Australia and NZ in April 2015

**Gandalf and the Geothermal Associations
of Australia and New Zealand extend to
you a very warm welcome**



Early bird registration closes end January 2015 ... the thrifty save \approx 10%



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Kia Ora