

AGEG Technical Interest Groups Meeting
Thursday 20th and Friday 21st November 2008
Adelaide, South Australia

Venues

Day One: National Wine Centre, Corner of Botanic and Hackney Roads, Adelaide.
Please see <http://www.wineaustralia.com.au/location/> for more information.

Day Two: Training rooms 1 & 2, Level 7, 101 Grenfell Street, Adelaide.

Meeting description

The AGEg Technical Interest Groups have formed to provide efficient and co-ordinated research identified by industry as being the highest priorities. **Day One** provides time for our TIG leaders to summarise plans, projects in progress and salient outputs to date results.

Reports will also be made on **Day One** by:

- Geothermal Programs in the USA (Alan Jelassic – USA Department of Energy)
- Working Group for the AGEg's Constitution and Affiliation with the International Geothermal Association (Barry Goldstein – Chair, AGEg)

Roundtable discussions on **Day Two** will resolve:

- Opportunities to enable ever-smoother operations and exemplary research outputs from the AGEg's Technical Interest Groups
- Industry's research priorities
- Priorities for international research alliances
- Cooperative structures and funding models to conclude priority research and for information sharing

Reports will also be made on **Day Two** by:

- International Partnership for Geothermal Technologies (Ralf Ernst – Department of Resources, Energy & Tourism)
- IEA Geothermal Implementing Agreement (Barry Goldstein – Contracting Party (PIRSA))

Who should attend:

AGEg member representatives or their proxies and AGEg TIG members.

Pay-your own way Himalayan banquet Thursday, 20th November

Venue: The Himalayan Kitchen, 66 Melbourne Street, North Adelaide
Ph: 08 8267 3037

Cost: \$34.50 pp for the banquet (drinks are additional)

Dietary restrictions will be accommodated.

A maximum of 45 people can be served (**early RSVPs are essential**)

Agenda - Day One. Thursday 20 November, 2008.

Venue: National Wine Centre, Corner of Botanic and Hackney Roads, Adelaide SA 5000

09:00 – 09:15	Welcome and Introduction, overview of meeting outcomes	Barry Goldstein
09:15 – 09:30	AGEG vision, terms of reference, membership, TIG structure and TIG objectives (Status of Constitution)	Barry Goldstein
09:30 – 09:45	TIG 1 Land Access Environment and social issues (Induced seismicity, radon, stakeholder engagement, etc)	TIG Co-leaders: Barry Goldstein, PIRSA Mike Malavazos, PIRSA
09:45 – 10:05	TIG 2 Reserves and Resources Align with similar International forums	TIG Leader: Adrian Williams, Geodynamics
10:05 – 10:20	TIG 4 Engineered Geothermal Systems Investigate technologies for enhancing geothermal reservoirs for commercial heat extraction.	TIG Co-leaders: Doone Wyborn, Geodynamics Peter Dowd, U of Adelaide
10:20 – 10:40	Morning tea	
10:40 – 11:00	TIG 6 Geothermal Power Generation Power cycles, plant performance, economics, environmental impact and mitigation	TIG Co-Leaders: Hal Gurgenci, U of Queensland & Behdad Moghtaderi, U of Newcastle
11:00 – 11:20	TIG 7 Direct Use Direct use for heating and cooling, with emphasis on improving implementation, reducing costs and enhancing use	TIG Co-Leaders: Klaus Regenauer-Lieb, CSIRO Don Payne, CoreEnergy
11:20 – 11:35	TIG 8 Outreach (Including Website) Create informed public through accessible information. Provide educational kits for media, K-12 and university education.	TIG Leader: Tony Hill, PIRSA
11:35 – 11:55	TIG 9 Data management Database design, contents, interpretation tools and ongoing enhancements.	TIG Leader: Anthony Budd, Geoscience Australia
11:55 – 12:10	TIG 10 Field Operations - Wellbore operations Drilling, casing, logging, fracture stimulation, testing, etc	TIG Co-Leader: Wellbore ops Cam Selin, CEA
12:10 – 12:30	TIG 10 Field Operations - Geophysical operations Tools and methods	TIG Co-Leader: Geophysics Des Fitzgerald, Intrepid
12:30 – 13:30	Lunch	
13:30 – 13:50	TIG 3 Policy Issues Industry advice to Governments – (AGEA) (Whole-of-Sector Issues still in scope for the AGEAG)	TIG Leader: Susan Jeanes, AGEA
13:50 – 14:05	TIG 5 Interconnection with Markets Transmission, distribution, network, NEM issues (Technologies still in scope for AGEAG)	TIG Co-leaders: Terry Kallis, Petrathern Ian Stirling, ElectraNet
14:05 – 14:30	Afternoon tea	
14:30 – 15:00	Report from US DoE	15:00 – 15:20 Report from RET
15:20 – 16:20	Roundtable discussion on TIG performance: what has worked well? what can work better? ideas for improving performance	
16:20 – 16:50	Recap Forward Actions	
16:50	Day one close	

Agenda - Day Two. Friday 21 November, 2008

Venue: Training rooms 1 & 2, Level 7, 101 Grenfell Street, Adelaide.

08:30 – 08:45	Welcome and Introductions
08:45 – 10:00	<p>Roundtable discussion of governance of TIGs</p> <ul style="list-style-type: none"> • Criteria to set TIG priorities • Roles/responsibilities, election and term (years) for TIG Leaders • Criteria for membership in TIGs • TIG Voting and record keeping • Criteria & processes for creating new TIGs and sub-TIG Working Group • Criteria and processes to terminate a TIG • Other matters <p><i>See Note 1 on the next page</i></p>
10:00 – 10:20	Morning tea
10:20 – 11:20	Roundtable discussion of Australia's geothermal research priorities, with reference to the Geothermal Industry Development Framework, the CoAG Roadmap for Geothermal Technologies and the opportunity to create a national Australian Geothermal Institute
11:20 – 12:30	<p>Recap Australian priorities.</p> <p>Endorsement of Australian geothermal research priorities</p>
12:30 – 12:40	Break – Transition before a Working Lunch
12:40 – 13:40	<p>Roundtable discussion of where capacity and competence exist within Australia to undertake high priority research listed in the previous discussion</p> <p>Deduce gaps that need be filled from above discussion</p> <p>Roundtable discussion: Do we have the right TIG Topics?</p> <p><i>See Table 1a and Table 1b for GIDF, EnGINE and DoE geothermal research priorities on the next page</i></p>
13:40 – 14:00	Break - Transition
14:00 – 14:40	<p>Recap Priorities for International Geothermal Alliances</p> <ul style="list-style-type: none"> • IPGT priorities (Ralf Ernst) • IEA-GIA annexes and tasks (Barry Goldstein) • IGA (Graeme Beardsmore) • EnGINE priorities (Tony Hill) • Others <p>Roundtable discussion on processes to foster efficiency & effectiveness (alignment)</p>
14:40 – 15:00	Break - Transition
15:00 – 15:45	Roundtable discussion of structures and processes (including funding models) to stimulate and sustain highest priority, complementary research / studies
15:45 – 16:15	Other Business
16:15 – 16:50	Recap /agree forward actions
16:50 – 17:00	Wrap-up and close

Note – the last 10 minutes of each session on day two will be used to recap priorities, decisions and forward actions.

Note 1: Details of the TIGs will be documented on tAGEG web-pages, in notes associated with the AGEg's Constitution and in the Constitution (as appropriate). The draft AGEg Constitution says, "Technical Interest Groups" means the sub-committees of the Australian Geothermal Energy Group (the Association) that operate in alignment with the purposes and terms of reference of the Australian Geothermal Energy Group (the Association). It also creates an AGEg Technical Interest Group Leaders Subcommittee comprised of all Technical Interest Group Leaders and Co-leaders. Each Technical Interest Group Leader and Co-leader may serve a term of 3 years, and may re-nominate for consecutive terms. Each Technical Interest Group Leader and Co-leader are unpaid volunteers endorsed by a simple majority of the members of each Technical Interest Group. All matters to be recommended to the Technical Interest Group Leaders Subcommittee for consideration as recommendations to the Executive Committee need be endorsed by a simple majority of ballots cast by email.

Table 1. Considerable alignment exists between the geothermal research and development priorities established by: **(1)** Australian experts informing the development of Australia's Geothermal Industry Development Framework (and the associated CoAG Roadmap for Geothermal Technologies); **(2)** the USA's Department of Energy (2008); **(3)** the Enhanced Geothermal Innovative Network for Europe (ENGINE, 2008); and **(4)** a very preliminary list of priorities for the newly signed International Partnership for Geothermal technologies (IPGT).

EGS Priorities	Petroleum Industry Priorities	Prelim IPGT Priorities
Share knowledge & drive complementary research	Improved HTHP hard rock drilling equipment	Revolutionary low cost drilling
Predictive production modelling	Improved HTHP zonal isolation	Rate of Penetration (ex hydraulic hammer)
Predictive reservoir and stress field characterisation	Reliable HTHP pumps for modest hole diameter	Zonal completion (isolation)
Mitigate induced seismicity / other HAZOPS	Enable well longevity (20-30 years)	High T packers (open & lined hole)
Condensers for high ambient-surface temperatures	Optimum HTHP fracture stimulation methods	Temporary sealing of fractures
Improve power systems	HTHP temperature logging tools and sensors	Production and injection pumps
Economic modelling tools	HTHP flow survey tools	Optimise operation & maintenance (benchmarking)
Technologies & methods to minimise water use	HTHP fluid flow tracers	Fracture stimulation procedures
Use of CO ₂ as a working fluid for heat exchange	Mitigation of formation damage, scale and corrosion	High T logging tools
Standard geothermal resource & reserve definitions		Seismic risk (Induced seismicity)
Education / training		Rock-fluid interaction (scaling, dissolution, etc)
		CO ₂ systems
		Geothermal Lexicon (outreach/education)
		Fed-State-Local government interaction (regulation, sharing of information, etc)

References

Department of Energy (DOE) 2008, An Evaluation of Enhanced Geothermal Systems Technology - Geothermal Technologies Program. See: http://www1.eere.energy.gov/geothermal/pdfs/evaluation_egs_tech_2008.pdf

Department of Resources, Energy & Tourism (DRET), 2008, Geothermal Industry Development Framework (Draft), 19 August 2008. See: http://www.ret.gov.au/energy/clean_energy_technologies/energy_technology_framework_and_roadmaps/geothermal_industry_development_framework_and_technology_roadmap/Pages/GeothermalIndustryDevelopmentandTechnologyRoadmap.aspx

Engine, 2008, Propositions for the definition of Research areas on Enhanced Geothermal Systems in ENGINE Newsletter N°11 – June 2008, pp 4-7. See: http://engine.brgm.fr/bulletins/ENGINE_Newsletter11_062008.pdf

Table 1b. Some forms of direct use of geothermal energy are already commercialised, but there remain vast low to moderate temperature geothermal resources that can be exceedingly valuable in the future, given technological advances that reduce costs of deployment to competitive levels. A scan of research and development priorities established by the AGEg's TIG for Direct Use follows.

Map regions where shallow thermal conditions are sufficient for cost-effective GSHPs	Improved efficiency of drilling equipment
Standardise definitions	Enable longevity (20-30 years)
Predictive production modelling for economic decision making	Mitigate HAZOPS
Predictive reservoir characterisation	Improve power systems
Use of refrigerants as a working fluid for heat exchange	Education / training
Technologies & methods to minimise water use	Economic modelling tools