



HOT DRY ROCKS PTY LTD

Geothermal Energy Consultants



Geothermal Targeting Technologies

**International Partnership for
Geothermal Technology**



Geothermal Targeting Strategies

Australian-style geothermal sources

- diverse range of geothermal prospects [EGS, HSA, etc]
- data limited world, not data free

Fastest route to improving robust geothermal targeting lies in developing methodologies for evaluating the significance of the available data in the context of the regional geological framework

We outline a plan for developing improved geothermal targeting strategies suited to the needs and timescales of industry by developing:

1. A comprehensive suite of prospect specific targeting strategies, appropriate to the full diversity of Australian geothermal prospects.
2. A coherent and efficient workflow for integrating all available information into a more rigorous framework for assessing uncertainties and quality of available data.

Aim to align the plan with GA's onshore energy program and UoM's ARC research



The Needs of Industry

Efficient targeting of geothermal resources must attach to two questions:

1. At the tenement scale the geothermal explorer is interested in prospect appraisal in order to build an appropriate exploration case (EGS, HSA, power generation, direct use etc). How can the explorer make informed estimates of prospects at the tenement scale?

2. At the reservoir scale the geothermal explorer needs to understand how to 'reduce risk' in targeting drilling programs. How does the explorer define optimal targets at the reservoir scale?

A need to understand and evaluate uncertainties in the thermal structure of the shallow crust. The ability to isolate and predict subtle variations of temperature at depth, and quantify uncertainties, with sparse and often poor quality near-surface data presents a major risk.

Thus develop methodologies that provide robust evaluation of the reliability of available constraints.



Research Program for Geothermal Targeting Technologies

Several parallel research programs to be undertaken. In orders of priority, assessed against the immediate needs of industry, the research program need to deliver:

- 1.A suite of prototype exploration models for the Australian Geothermal Industry (these should be readily adaptable to other parts of the world).
- 2.A suite of targeting methodologies appropriate to the range of geothermal prospects that Australia offers. Key targets will include our most prospective acreages [South Australian Hot Rock province, the Gippsland and Perth basins].
- 3.An efficient thermal modelling workflow that includes inversion capability.



Research Program for Geothermal Targeting Technologies

4. Utilising appropriate geothermal computational solvers to evaluate the reliability of the information already collected [by applying geophysical inversion methodologies, uncertainties can be evaluated in a quantitative sense giving a framework for evaluating the significance of the available information, and how best and most efficiently to add new value]. To do so requires development of efficient workflow's that link available constraints to geothermal computational engine.
5. Assessments of new geophysical technologies.
6. Advance new geophysical methods for assessing geothermal prospects [given that acquisition of high quality heat flow data is slow and expensive].



Budget

	UoM		Industry				Federal
			HDRPL		other		
	In kind*	Cash*	In kind*	Cash*	In kind*	Cash*	Cash*
Year 1	220		102		102		600
Year 2	220		102		102		520
Year 3	220		102		102		540
Year 4	220		102		102		560
Year 5	220		102		102		580
Total	1100		510		510		2800

* In AU\$1,000s



Donor Contributions

Federal Government: support appointment of three key postdoctoral research staff in each of the three main program areas, research assistance serving all three programs including acquisition of crucial new data and development of testbeds for each of the prototypes, and the requisite infrastructure to initiate the projects in a timely fashion.

University of Melbourne: provide in kind support for a project leader at 0.5 ft equivalent, and accommodation of appointed staff and access to university facilities as needed to conduct their research.

Hot Dry Rocks Pty Ltd: contribute effective theme leader contributions at 0.2 ft equivalent, plus access to existing computational resources to the value of A\$50k per year.

Other industry participant to contribute equivalent to HDRPL