Geothermal energy legislation developments in Queensland

Melissa Zillmann* and Myria Makras
Energy Industry Policy Division, Department of Employment, Economic Development and Innovation, 61 Mary Street, Brisbane Qld 4000
Corresponding author: melissa.zillmann@deedi.qld.gov.au

The *Geothermal Energy Act 2010* (the Act) was passed by the Queensland Parliament in August 2010. The Act has been primarily established to provide a regulatory framework for the production of geothermal energy.

On commencement, the Act will repeal the current *Geothermal Exploration Act 2004* (the Exploration Act) which solely regulates geothermal exploration. The new Act largely duplicates the current exploration legislation, however experience and feedback gained from operation of the Exploration Act has led to some beneficial changes to the exploration regime.

Importantly the Act introduces a regulatory regime for geothermal production which will enable geothermal exploration permit holders to progress to a production tenure when a suitable geothermal resource has been identified.

This paper outlines the key changes to the exploration regime and the framework for geothermal production included in the Act.

Keywords: Queensland, geothermal energy legislation, geothermal production, production threshold, geothermal exploration, *Geothermal Energy Act 2010*, *Geothermal Exploration Act 2004.*

Geothermal Energy Act 2010

The Queensland Government recognises the importance of geothermal energy as a valuable energy resource that has the potential to contribute significantly towards reducing the State's carbon footprint. The *Queensland Renewable Energy Plan* launched in June 2009 outlined a roadmap for the expansion of the renewable energy sector in Queensland. The Plan forecasts 250 megawatts of generation capacity based on geothermal energy in Queensland's generation capacity mix by 2020. Development of this Act is a key milestone that will support development of the geothermal industry in Queensland and enable this forecast to be met.

The objectives of the Act are to encourage and facilitate the safe exploration for, and production of, geothermal energy. This will be achieved by providing for the grant of geothermal exploration permits to explore for sources of geothermal energy across the State and for the grant of geothermal production leases for large-scale geothermal production.

Where possible, the Act aims to ensure maximum consistency with Queensland's existing resource-based legislation and geothermal legislation of other jurisdictions.

Changes to geothermal energy exploration in Queensland

Land available for geothermal exploration

Under the current Exploration Act, an exploration permit can only be obtained when the State has facilitated a land release for competitive tender. This means the timing of exploration, and the land made available, is at the discretion of the State.

Under the new Act, applications for exploration permits will be available via two processes. Firstly, the tender process provided in the Exploration Act has been modified and is referred to as a 'released area' process. This will provide an 'application period' where applications may be made. Any applications within this period will be considered competitively after the period ends. Secondly, a new process which enables eligible persons to apply for exploration permits over land of their choice and at a time appropriate to them is introduced by the Act. This process is referred to as an 'over the counter application'. The introduction of this new application process will provide greater flexibility in gaining access to land for geothermal exploration activities and support increased geothermal exploration in Queensland.

In addition to making more land available for exploration, the exploration regime under the new Act increases the maximum area that can be applied for under an exploration permit. The area will be increased from 200 sub blocks (600 km^2) to 50 blocks (3,750 km^2) which brings the exploration permit area into line with other States and increases the chances of identifying a commercially viable geothermal energy resource. The term of an exploration tenure has also been increased under the Act from 12 to 15 years.

Exploration Exemption

To encourage use of geothermal energy for the purposes of geothermal heat pumps for heating and cooling buildings, the Act does not regulate exploration for these purposes. Exploration of this nature will generally depend on shallower operations within the relevant property boundary, which will not have the same impact on the environment and landholders as other exploration activities.

Retention Status

It is recognised that there may be delays between the discovery of a geothermal resource and its commercialisation. These delays could be related to factors such as investment attraction, development of infrastructure or securing supply contracts.

To address these issues, the Act introduces a retention status by way of a 'Potential Geothermal Commercial Area'. This is similar to the retention status provided for under the *Petroleum and Gas (Production and Safety) Act 2004*. The 'Potential Geothermal Commercial Area' can be granted for up to 5 years but it can not extend beyond the maximum term allowed for in the underlying exploration permit.

The grant of a 'Potential Geothermal Commercial Area' may provide an exemption from relinquishment provisions and may enable suspension of the exploration permit's work program where appropriate. However, an evaluation program will be required to ensure that the exploration permit continues to be actively developed and brought to production.

Production Testing

The Act provides clarity that restricted production testing can be carried out under an exploration permit to determine whether a geothermal resource is suitable for commercial development. The commercial grade of the geothermal energy resource will need to be quantified before an application for a production lease can be made. Before testing can commence, a test plan must be provided and any relevant authorities will need to be obtained.

Transitional provisions for Exploration Act permit holders

The Act provides existing exploration permit holders a period of 12 months to transition to the new geothermal energy framework after the commencement of the Act. Whilst the Act contains extensive provisions that automatically transfer tenures, decisions and processes to the Act, current exploration permit holders will need to comply with the requirement to obtain an environmental authority. A period of 12 months from commencement of the Act has been deemed a sufficient timeframe to comply with this requirement.

Geothermal production regime

The primary purpose of the Act is to introduce a framework for geothermal production. The principal means for allocating geothermal resources for production are via a production lease.

Under the Act, a production lease can only be applied for on the basis of an existing exploration permit. A person who is not an exploration permit holder can only apply for a production lease if it is done jointly with an exploration permit holder or with the consent of the exploration permit holder. These provisions give priority production rights to exploration permit holders provided they comply with the requirements of the Act.

Scope of the Act (for production)

The proposed geothermal energy regime provides for a sliding scale of regulation of geothermal energy production under several Queensland Acts, according to the scale of production. Activities that are small or medium scale production will not be regulated by the Act.

Furthermore, the Act is not intended to regulate any associated use of the geothermal energy produced, such as in power stations or industrial activities. To minimise regulatory duplication, the use of geothermal energy will be regulated when it triggers existing legislation such as the *Electricity Act 1994* and the *Sustainable Planning Act 2009.* For example, a production lease holder may be granted rights to extract geothermal energy which may be used to produce electricity, but approvals to supply electricity must be obtained under the *Electricity Act 1994* and the building of any necessary infrastructure must be authorised under the *Sustainable Planning Act 2009.*

Small to medium scale production threshold

The use of heat pumps (considered as small scale production) will be encouraged under this framework since their use is not regulated by the Act and its requirements to obtain a production lease and provide development plans.

Under the *Plumbing and Drainage Act 2002*, installation of pipes for the purpose of conveying water within premises may only be undertaken by a licensed plumber. It is proposed to amend the *Plumbing and Drainage Regulation 2003* to allow the Queensland Plumbing and Wastewater Code to provide a framework for the regulation of the installation of geothermal heat pumps

Geothermal energy production below the large scale production threshold that is not via heat pump technology is considered to be medium scale production and it will not be regulated by the Act. Instead it will be regulated if the geothermal energy use triggers requirements under existing legislation such as the:

- *Sustainable Planning Act 2009* (material change of use provisions)
- *Water Act 2000* (taking or interfering with water provisions)
- *Environmental Protection Act 1994* (environmentally relevant activities provisions)

Large scale production threshold

The Act only regulates the large-scale production of geothermal energy. The Act provides that the threshold for large scale production will be prescribed in the supporting geothermal regulation.

Currently a power threshold which is not technology-specific and is flexible enough to apply to a variety of geothermal production applications is being considered to define the large-scale production threshold. A power threshold provides a direct measure of the rate of production of the geothermal resource that does not depend on how the resource is being utilised, thus avoiding the need to consider conversion efficiency.

A primary policy consideration for setting the threshold is that it should be set at a level low enough to enable commercial geothermal production activities of potential importance to be monitored by the Government. However, this needs to be balanced so that the threshold is set high enough to ensure that the uptake of smaller-scale geothermal activities which may offset carbon emissions are not unnecessarily captured or stifled by a requirement to have a production lease. Further consultation will be undertaken during preparation of the supporting regulation about how the large-scale production threshold will be defined.

Geothermal production leases

A geothermal production lease must be applied for if the proposed activities will trigger the threshold for large sale production. Geothermal energy production is defined in the Act as the recovery of geothermal energy from beneath or on the surface of the land in which it is contained.

The area required for geothermal production is not as large as the area required for geothermal exploration. Hence the Act allows for a maximum production lease area of 25 blocks (1, 875km^2).

A production lease applicant must prepare a development plan setting out how the geothermal energy resource will be developed, and the proposed rate of energy production. The grant of a production lease requires the holder to commence commercial production within 2 years of its grant. To allow the ongoing monitoring of resource development, the holder will be required to submit further development plans during the term of the lease.

A geothermal production lease has an initial maximum term of 30 years. Subsequent renewals of the lease are limited to a maximum of 20 years, with no limit on the number of renewals that can be made.

Sub-lease of geothermal production lease

A holder of a geothermal production lease may sublease an area of the lease to a third party. The sublease is subject to approval by the Minister. Where a sublease has been approved and registered, the holder of the geothermal production lease must continue to comply with any terms and conditions of the lease including the area of the sublease.

Royalty

The Act provides that a royalty is payable on the use of geothermal energy. The royalty rate will be specified in the supporting regulation.

The Queensland Government recognises that the geothermal industry is in its infancy and faces technological and financial barriers to development. Key features of the royalty provisions include a royalty holiday and royalty free threshold that are aimed at reducing costs to geothermal production during the early start-up stages.

A royalty holiday that provides a full exemption from the payment of any royalties will be provided until 2020. Whilst the first half of the next decade is expected to be characterised by increased exploration activity, the later part of the decade should see geothermal projects coming into production and benefiting from this initiative.

After 2020, a royalty-free threshold will ensure that in the early years of production when financial margins may be low, a royalty is not payable if the wellhead value is below the royalty-free threshold.

General authority provisions

A number of key provisions apply to both exploration permits and production leases. These provisions are outlined below.

Environmental management

Persons proposing to carry out geothermal activities are required to obtain the relevant environmental authority under the *Environmental Protection Act 1994* before an exploration permit or a production lease can be granted.

Exploration activities conducted under an exploration permit will be classified as level 2 environmentally relevant activities under the *Environmental Protection Regulation 2008* (environmental regulation), unless these activities operate in an environmentally sensitive area or are associated with an environmentally relevant activity stated in schedule 2 of the environmental regulation.

Production activities conducted under a production lease will be classified as level 1 or level 2 environmentally relevant activities, depending upon the scale of production and associated environmental harm. This approach

largely ensures consistency with existing Queensland resource-based legislation in relation to environmental management requirements.

Where the geothermal energy produced is used for another activity that is an environmentally relevant activity under the environmental regulation e.g. aquaculture, that activity will require the relevant authority under the *Environmental Protection Act 2009* and the environmental regulation.

Water Management

The Act does not create any rights to water. Any relevant authorisations under the *Water Act 2000* must be obtained before an exploration permit or a production lease can be granted. The water authority will ensure that the taking of water for geothermal energy exploration or production is managed within a whole-of-catchment plan that ensures environmental flows are maintained.

The grant of a geothermal tenure will not create any preference or priority for the grant of a water entitlement. Geothermal tenure holders will be treated the same way as any other potential water users and may need to pay the market price for a water entitlement in order to consume water in the process of exploring for or producing geothermal energy.

The Act also mandates that an exploration permit or production lease applicant must assess any potential structural or other impacts on aquifers of the carrying out of the proposed activities. The Minister must consider this issue when deciding whether to grant the exploration permit or production lease.

Safety

Geothermal drilling and related activities are similar to those for petroleum and gas activities. Therefore, the safety and health aspects of geothermal energy exploration and production will primarily be regulated under Queensland's *Petroleum and Gas (Production and Safety) Act 2004* (P&G Act).

Currently, the definitions of operating plant under section 670 of the P&G Act only apply to certain authorised activities carried out in a geothermal tenure area.

In practice this would mean that other authorised activities on the tenure are regulated under the *Workplace Health and Safety Act 1995* (WH&S Act). The P&G Act and the WH&S Act have been amended to clarify the different responsibilities of the Department of Employment, Economic Development and Innovation and Workplace Health and Safety Queensland in relation to safety management on a geothermal tenure.

The construction of new operating plant will continue to be covered by the WH&S Act.

Geothermal exploration activities that involve, for example, seismic testing and drilling, will continue to be regulated under the P&G Act. Other activities associated with geothermal exploration (for example, construction activities) will continue to be regulated under the WH&S Act.

Petroleum type drilling does not occur in the production of Hot Sedimentary Aquifer (HSA) sources of geothermal energy. As such, the Act will not apply the safety provisions contained in the P&G Act to HSA geothermal production, regardless of the scale of the operation. These operations will continue to be covered by the WH&S Act.

Overlapping authorities

The Act includes provisions about overlapping authorities under different Acts. For example, a proponent may apply for a geothermal production lease over an area where another resource tenure exists under the P&G Act, the *Greenhouse Gas Storage Act 2009* or the *Mineral Resources Act 1989*.

The purpose of allowing overlapping authorities is to ensure the optimum use and appropriate management of the area's resources and is enshrined in all Queensland resource-based legislation.

The decision as to which resource authority gets priority rests with the Minister, who must consider specific criteria, including submissions made by each authority holder who would be affected by the grant of a geothermal tenure over the shared area, as well as the public interest.

The Act does not allow for an overlapping authority to be provided for two geothermal energy tenures. However, the Act allows a geothermal production lease holder to sub-lease a part of the land within the lease to any party that is an eligible person, as defined by the Act.

Land Access

The Act contains landmark changes to the way a number of Queensland resource tenure and authority holders may access private land and how compensation arrangements are arrived at. Under the changes, geothermal tenure applicants and holders will have new responsibilities in relation to land access.

The Act introduces a requirement for all geothermal authority holders to comply with a Land Access Code as a condition of the authority. The Land Access Code is structured in two parts: Part 1 which outlines non-statutory best practice guidance for communication between authority holders; and Part 2 which describes mandatory conduct conditions that must be complied with by authority holders.

The Act introduces activity thresholds that increase the level of regulation as the intensity or

impact of the proposed activity increases. This is a sensible measure that balances the level of regulation with the level of impact.

Early exploration activities may have minimal impact on private or public landholders. The Act defines these as 'preliminary activities' which might include taking rock, water or soil samples and walking the land.

For preliminary activities, a geothermal tenure holder will be required to give each owner or occupier of land within the tenure area an entry notice and copy of the Land Access Code at least 10 days prior to entry. Access for these activities does not require a Conduct and Compensation Agreement.

When the impacts of proposed activities on the private landholder or occupier are more significant, a higher level of accord is required. These activities are referred to as "advanced activities".

To access land to conduct advanced activities, geothermal tenure holders must either be party to a conduct and compensation agreement or a deferral agreement with each 'eligible claimant' for the land or have made an application to the Land Court to determine compensation. As defined in the Act, an 'eligible claimant' is each owner or occupier of private land or public land that is in the area of, or is access land for, the tenure. Where agreement is not reached, the framework provides for conferences or independent alternative dispute resolution (ADR) to be held.

To assist in the negotiation process, standard conduct and compensation and deferral agreements have been developed in consultation with resource and agriculture industry peak bodies, along with a negotiation tip sheet for landholders.

Conferences or ADR will become a legislative requirement if agreement negotiations break down. Matters cannot be referred to the Land Court for determination until a conference or ADR process has occurred. This requirement is aimed at resolving disputes early at the local level, without the expense of legal resolution.

A detailed compliance and enforcement strategy is currently being developed to ensure that these new land access provisions achieve their full effect on the ground, particularly with respect to the Land Access Code.

Development of geothermal energy subordinate legislation

The Act will commence by proclamation. It is anticipated that the Act will commence in the later part of 2011. During the intervening period, supporting subordinate legislation, guidelines and training will be developed and systems upgrades will be carried out in preparation for the Act coming into force. There will be opportunities for industry involvement in the development of the subordinate legislation in late 2010/early 2011.