

POLICY IMPLEMENTATION TO ENABLE ACCELERATED GEOTHERMAL DEVELOPMENT

R. Gordon Bloomquist, Ph.D.

Nevada Geothermal Power, Inc.

ABSTRACT

Policy implementation can be a very strong tool when it comes to encouraging the development and financing of geothermal energy projects. Developers and especially financiers are unwilling to invest large amounts of money in projects that carry undue legal, institutional, regulatory and environmental risks. In order to facilitate and accelerate geothermal development countries should look carefully at policies related to the granting of and terms of concessions or leases, market policies including such things as long term power purchase agreements and feed in tariffs, incentive programs and last but not least policies relative to foreign investment. Creating a very positive climate that encourages development is essential if geothermal development is to realize its potential.

Key Words: geothermal, investing, policy development, power purchase agreements

INTRODUCTION

The worldwide potential for geothermal development is tremendous, innovative design has solved most of the issues surrounding the development of hydrothermal resources and yet the geothermal industry continues to grow at a relatively slow pace. If the geothermal resource potential is as significant as most experts estimate and if we truly have solved most of the technological problems, why is it that we do not see a tremendous accelerated growth of the industry? In much of the developing world and if we take Africa as an example we find that the estimated potential in East Africa could exceed 20,000 MWe, the need for power is increasing exponentially and yet geothermal development outside of Kenya is more or less nonexistent. There has to be other factors that deter development and discourage investment. The most likely deterrent is an almost total lack of an institutional, legal and regulatory environment that provides the needed safeguards, incentives and framework that is required by international developers and investors. It is thus of paramount importance that each and every country access their policies, regulatory and institutional framework, incentive programs and climate for foreign investment in order to accelerate geothermal development, achieve energy goals and ultimately move the country into a much more economically progressive and sustainable position. The facilitation of private investment in geothermal energy requires that governments create a legal, institutional and regulatory environment that is truly conducive to large-scale investment by the private sector. Through the establishment and implementation of such reforms, countries take a proactive role in creating an environment that is conducive to foreign investment and ultimately to ensuring that development of the nations geothermal resources will take place.

ACCESS

Although government estimates of geothermal resource potential are often extremely encouraging, the private sector needs to be able to obtain a lease or concession that provides not only the initial access to the resource area required to undertake detailed reconnaissance, exploration and reservoir confirmation activities; the lease or concession must also provide for long term development and operation rights should a developable resource be discovered.

Providing access requires the development of comprehensive geothermal statutes, which address all aspects of leasing and exploration as well as the provisions of project development rights.

The first task is to define “Geothermal” and place it into the context of existing water, mineral and land rights.

Is it water, mineral or Sui Generis (unique unto itself)?

The second is to determine who owns that resource. Is it the holder of the:

- Water rights?
- Mineral estate?
- Surface estate?

Access can be provided through:

- Exploration permits
 - Exclusive or non-exclusive
 - Convertible or non-convertible to a lease/concession
- Non-competitive leases/concession
- Competitive leases/concession
 - Cash bonus bids
 - Royalty bids

Leasing terms must also be well defined in statute.

- The duration of primary exploration permit or lease/concession and whether or not it is extendable and with what terms
- Fees: Rentals and royalties
- Work requirements
- Environmental compliance

ACCESS TO A ROBUST AND FAIR MARKET REQUIRES:

Although we often focus our attention on ensuring that the private sector has access to the resource area and long term development and operational rights, it is really access to market that allows developers to raise the significant risk capital that is required to carry out exploration, reservoir confirmation drilling, production drilling and ultimately power conversion facility construction and operation. In order to ensure access to market governments need to provide for the following:

- Empowerment of private partners to engage in the generation of electricity or supply of thermal energy.
- Authority for public entities to enter into legally-binding relationships designed to provide a firm, reliable stream of payments to support private project financing.
- Authority for the private party to have a legal entitlement to payments made by the ultimate consumer of the goods/services provided.
- A level playing field relative to the provision of power by private vs. public suppliers.
- A transparent regulatory framework with regulatory agency independence from influence by government, electricity suppliers, or customers.
- Market power abuse prevention.
- Clear contract dispute resolution procedures.
- Government mandated renewable portfolio standards.

The Power Purchase Agreement (PPA) must obligate the energy purchaser to purchase enough power or thermal energy from the project to support project debt.

The agreement must provide a firm commitment at a specified revenue level or levels not subject to material charges or offsets.

Key provisions include:

- A fair price which may include a capacity component to cover fixed costs and an energy component to cover variable costs.
- A term that fits with the projected construction and operation schedule and at a minimum equal to the term of financing.
- Significant flexibility in terms of the on-line date.
- Significant flexibility relative to the ability to nominate output under the contract (up or down).
- Details of interconnection requirements and charges, design and construction requirements, equipment and monitoring, and continuation of services if an outage occurs.
- Protection against changes in project economics due to changes in environmental laws.
- Assurance that the PPA will not be subject to continuing government revisions.
- An obligation to continue capacity payments (at a level sufficient to cover debt service) during force majeure periods.

GOVERNMENTAL INCENTIVE PROGRAMS

If developers have both resource access as well as market access it is still extremely difficult to secure required equity financing and nearly impossible to obtain any form of conventional financing for upfront exploration and



reservoir confirmation drilling. If countries are truly interested in and committed to the development of indigenous geothermal resource development to help meet further demand for electricity and/or thermal energy it is imperative that incentive programs be initiated that either provide a mechanism for risk sharing between the government and the private investor or provide some form of risk mitigation instrument such as risk mitigation insurance against failure of exploration or reservoir confirmation drilling. Once an economically viable resource has been discovered, governments can continue to play a strong supportive role through the tax policy and in some cases guaranteed loans.

Government policies that can encourage and accelerate geothermal development and aid in the securing of financing include:

- Availability of government grants for exploration and/or development.
- Government cost sharing of exploration costs.
- Risk mitigation insurance for exploration and/or development drilling.
- Government backed guaranteed loans for project development.
- Provision of investment and/or production tax credits.

THE INVESTMENT CLIMATE

Developing and enacting comprehensive geothermal statutes and establishing sound energy related policy, although critical, is usually insufficient to attract private sector investment and project development. Developers and more importantly investors are extremely reluctant to commit to project development and financing in countries where there is no substantial history and experience of private sector energy project development and operation. To overcome this, governments can proactively focus on the enactment of statutes that provide the private sector with safeguards that improve the investment climate. Of critical importance are the following:

- Removal of foreign ownership prohibitions or limits.
- Providing authority to do business, including confirmation of legality of ownership vehicles, and removal of restrictions, if any, on changes of ownership control.
- Codification of all required government approvals, permits, licenses, etc., and mandated government support of the expedited processing of all required approvals, permits, and licenses.
- Establishment of an agency or office with the mandate to serve as a “one stop” shopping center for all required approvals, permits and licenses.
- Providing protection against uninsurable force majeure events such as war, insurrection, terrorism, general strikes, etc.
- Clear delineation of tax and customs statutes.
- Establishment of protections governing availability of foreign exchange, currency convertibility and exchange rate coverage.
- Provisions against expropriation.
- Provisions for import and export tariff relief.
- Expedited clearance of all goods.
- Clarification of employment laws, including use of expatriates.
- Intellectual property protection:
 - Registration of rights
 - Enforcement of rights
- Clearing defined dispute resolution, including:
 - Governing law
 - Location of proceedings
 - Arbitration or courts
 - Sovereign immunity
 - Enforcement of judgments

CONCLUSION

Geothermal development is per say a very high-risk venture with no assurance that significant expenditures in exploration and reservoir confirmation drilling will result in the discovery of a resource that can be economically developed. Because of this both developers and investors must have assurances that once a developable resource has been discovered that this investment can result in the generation of significant revenue to cover debt service as well as an acceptable rate of return on investment. Governments can play a very significant role in providing developers and investors with required access to resource areas, access to markets

and an attractive investment climate. It is clear that developers and investors are as concerned about the business climate in any given country as they are about the resource potential. Investments flow to those countries that have seriously considered the needs of private sector investment, instituted necessary reforms, enacted comprehensive geothermal statutes and have a policy that encourages private sector energy development, renewable energy development and most importantly geothermal energy development.

SELECTED REFERENCES

- R. Gordon Bloomquist, 2010, *Facilitating Geothermal Development Through Policy Implementation*. Proceedings – Open Seminar on Low-Carbon Energy Supply Policies for APEC. Tokyo, Japan.
- Bloomquist, R. Gordon, Susan Petty and Roger Wagner, 2007, *Geothermal Risk Mitigation Instrument and Incentive Program*. The World Bank, Washington, D.C.
- Bloomquist, R. Gordon, Matthew H. Brown and Jennifer A. DeCesaro, 2005, *State Policy Options-Geothermal Leasing*. National Conference of State Legislatures, Denver, Colorado.
- Bloomquist, R. Gordon, Matthew H. Brown and Jennifer A. DeCesaro, 2005, *State Policy Options-Geothermal Policy*. National Conference of State Legislatures, Denver, Colorado.
- Bloomquist, R. Gordon, Matthew H. Brown and Jennifer A. DeCesaro, 2005 *State Policy Options-Defining and Characterizing Geothermal Energy*. National Conference of State Legislatures, Denver, Colorado.
- Bloomquist, R. Gordon, 2005, *The Evolution of U. S. Policy Designed to Encourage Geothermal Development*. World Geothermal Congress 2005 Proceedings, Antalya, Turkey.
- Knapp, George M. 2005, *Financing Geothermal Projects: Short Course number 4*, World Geothermal Congress Proceedings, 2005, Antalya, Turkey.
- Bloomquist, R. Gordon, 2003, *United States Geothermal Policy-Provision of Access and Encouraging Project Development*. International Course on the Sustainable Use and Operating Policy of Geothermal Resources, International Geothermal Conference, Reykjavik, Iceland.
- Bloomquist, R. Gordon and George Knapp, 2002, *Economics and Financing in Geothermal Energy*, UNESCO Chapter 9, Editors M.H. Dickson and M. Fanelli.
- Bloomquist, R. Gordon, 1995, *National Geothermal Policy and Regulation in the United States*. Proceeding, World Geothermal Congress 1995, Florence, Italy.
- Bloomquist, R. Gordon, 1995, *Understanding the Lenders' Criteria for Funding*. Pre-Congress Short Course Proceedings, World Geothermal Congress 1995, Pisa, Italy.
- Bloomquist, R. Gordon, 1992, *Financing Geothermal Projects-Small Geothermal Resources-A Guide to Development and Utilization*. UNITAR/UNDP Centre on Small Energy Resources, United Nations.
- Bloomquist, R. Gordon, 1986, *A Review and Analysis of the Adequacy of the U.S. Legal, Institutional and Financial Framework for Geothermal Development*. Pergaman Press.