

CORPORATE CAPABILITIES



JRG | Energy
www.jrgenergy.com

OUR IDENTITY

WHAT, HOW and WHY

WHAT

JRG Energy provides project engineering, supervision, technical support and training as well as customized products and services for the renewable energy sector.

HOW

We work ethically through local partnerships and service providers.

WHY

Our experience, expertise, and quality of service coupled with our versatile business model provides peace of mind, and you the ability to invest more in your project and less in our overhead.

JRG Energy is headquartered in New Zealand with branch offices scattered around the world.

OUR SERVICES

GEOTHERMAL Upstream: Engineering and Operations

Exploration and Surveying

- Exploration Process Consulting
- Resource Consenting
- Due Diligence

Drilling and Well Testing

- Drilling Management Services
- Petrophysical Log Interpretation
- Design and Analysis of Well Tests
- Reservoir Modelling and Stimulation
- Completions and Wireline
- Reservoir Assessment

Well Intervention and Scale Removal

- Wireline /Slickline
- Coil Tubing Operations
- Capillary Tubing Operations
- Chemical Inhibition Systems

High Temperature Plugs and Wellhead Removal Service

GEOTHERMAL Downstream: Project Engineering and Management

- Resource Consenting
- Direct Heat Feasibility Study and Implementation
- Power Station Engineers
- Steamfield Design and Procurement
- Bid and Tender Review and Management
- Construction Management
- Peer Review
- Quality Control and Assurance
- Contract and Financial Management
- Design Documentation Review
- Budget Analysis and Financial Planning
- Commissioning and Handover

SOLAR: Operating and Consulting Services

Utility Solar, Commercial, Residential and Agricultural Solar Services

NATURAL RESOURCES:

Water resource management

Joint Renewable Group, referred hereforth as **JRG Energy**, is an established group of highly experienced professional engineers, consultants and technicians committed to **making it easier for you to reach your project goals**. JRG Energy provides innovative project management and global engineering consulting services for the upstream and downstream geothermal industry as the well as solar and natural resource industries.

HOW WE OPERATE

JRG leverages a core team of employees combined with an international network of consultants to maximise our effective range while minimizing financial overheads, ultimately offering exceptional service at lower costs. This structure allows us to operate legally in remote development areas around the world and allows us to utilize key skills obtained through localized experience. JRG Energy is able to offer a full suite of services and undertake a variety of roles within projects.



***We make it EASIER
for YOU to reach
your project goals***

MISSION

To provide value and develop relationships through a full suite of specialized services for the global renewables market, driven by innovation, experience, and integrity.

GEOHERMAL UPSTREAM SERVICES

Engineering and Operations

EXPLORATION AND SURVEYING

Exploration Process Consulting:

JRG Energy's Geologist's and Project Manager's offer strategic geothermal exploration process consulting through comparing and overlaying geological and geophysical data from various datasets.

Due Diligence:

JRG Energy's experienced team of project engineers, analysts, financial managers and geologists understand the importance of mitigating strategic, operational, financial, hazardous, and socio-environmental risks before committing to a project. Technical due diligence services can provide risk analysis for project assessment. JRG provides due diligence research methods and resource estimates, review of size and capacity of resources, as well as project development studies, risk identification, assessment, and prioritization of risks.

Resource Consenting:

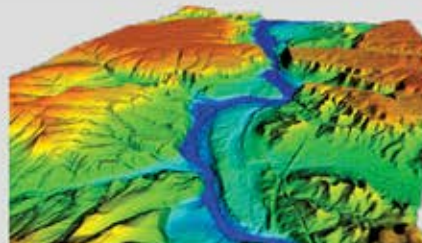
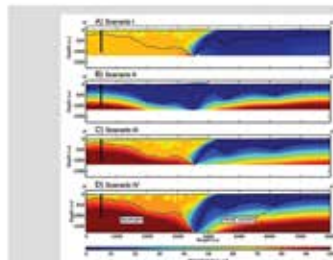
JRG Energy can project manage all Resource Consenting requirements in the perspective project locations. Resource consenting mitigates the environmental impacts of activities and are primarily controlled by the local governments' Resource Management laws. These laws regulate requirements to apply for resource consent as well as through any conditions for permitted activities included in the relevant regional or district plan. JRG Energy's team will lead you through all the steps required to comply with the local Resource Management laws in an effective and efficient manner.



Exploration, Surveying and Inspection:

Partnering with our affiliate, Aerosphere Inspection, JRG Energy utilizes drone technology for a revolutionary new method to exploration, geology, surveying, and industrial inspection for the renewable energy sector. This includes:

- Ability to perform various inspection and surveying techniques efficiently and safely using cutting edge technology and sensors
- Large area surveys to determine best renewable energy source in remote locations
- IR capability to perform thermographic maps and heat flux calculations
- Land surveying equipment to perform well pad surveying, access road planning, topographic maps and more



GEOHERMAL UPSTREAM SERVICES

Engineering and Operations

DRILLING AND WELL TESTING



Drilling Management Services:

JRG Energy offers project management and well testing services for production and injection wells in all types of environments. JRG's team covers the entire range of possibilities, from simple, shallow temperature gradient holes to the most complicated, deep multi-legged completions. JRG manages geothermal drilling projects from well site selection to testing and clean-up.

Design and Analysis of Geothermal Well Tests:

JRG Energy offers design and analysis services for well tests. Whether the client has a recently completed well or they acquired old wells that need to be evaluated for production or injection feasibility, JRG's experienced team can design, implement and analyze the well tests.

Reservoir Modelling

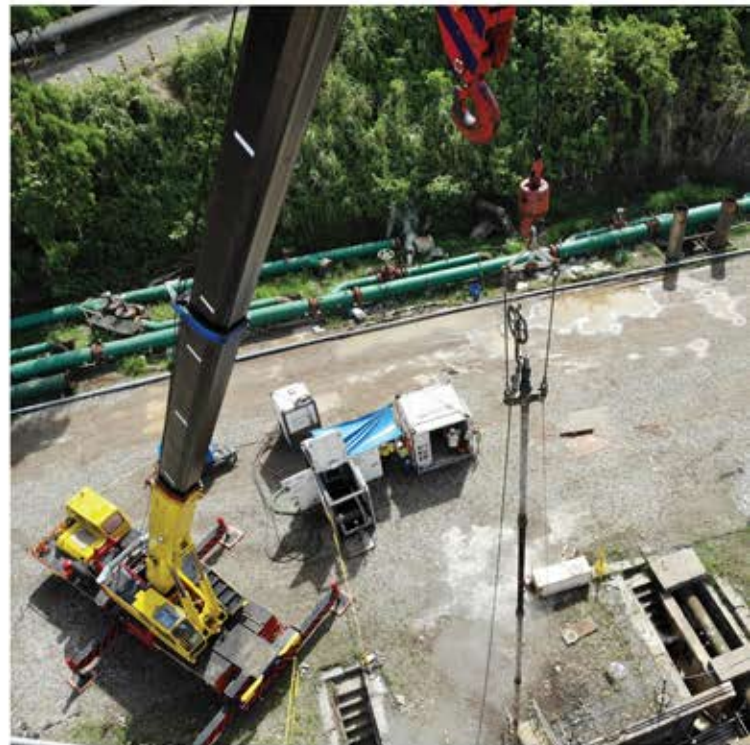
JRG Energy provides reservoir engineers and geologists to conduct resource modeling. JRG includes background research, design and modelling, such as how much additional generation would occur if JRG acidized the well, financial risk assessment (ROI, NPV), procurement of outside services, site supervision, engineering, and post-job well tests.

Completions and Wireline:

JRG Energy's wireline and completion technologies, thorough planning, and a zero-tolerance approach to risk avoidance maximizes production, reduces intervention costs, and extends the life of the well. The scope of our completion solutions enables you to create a path from formation to surface, regardless of your well type or operating environment. Across cased and open hole completions, JRG delivers products and services to provide optimized solutions to fit specific problems, providing return on your field development investment.

Resource Assessment:

JRG Energy's Reservoir Engineers are trained to reduce resource risk through expert assessment. Assessing the risks and opportunities in a resource is critical to long term success. From geological to economic analysis of dry or flash steam and binary cycle geothermal power for low enthalpy, single-phase water, two-phase water, single-phase steam and hypersaline brine, JRG's resource assessment services are all encompassing.



GEOHERMAL UPSTREAM SERVICES

Engineering and Operations

WELL INTERVENTION AND SCALE REMOVAL

Wireline / Slickline:

JRG Energy's wireline/slickline supervision and project management services include measurement, well intervention, and remediation operations that use conductive cable or slickline to convey equipment and measurement devices into open and cased-hole wells.

JRG Energy partners with local service providers to offer a turn-key slickline service that includes pre-job planning and assessments of all the problematic wells requiring well intervention. This includes: Well data review, Reservoir analysis for the well to undergo pre-post intervention output results, Intervention expectations and measurement criteria, Post job evaluation and continuous monitoring/support.

Coil and Capillary Tubing Operations:

JRG Energy offers expert supervision and project management of coil and capillary tubing operations through their network of international providers. This includes, Live well scale cleanouts using mills and under-reamers, acid washing, acid placement, air nitrogen lifts, fishing, cement and well abandonments, casing scraper runs, abrasive perforations and deflagration, plug and packer placement and retrieval, direction memory tool conveyance for horizontal or deviated wells, and tubing conveyed perforating. As well as radial drilling, chemicals injection, matrix stimulations, gas lift, dewatering, hydrates removal, cleanouts, mechanical interventions, flowline blockage removal and downhole tool operations.

Chemical Inhibition Systems:

JRG Energy offers chemical inhibition systems as a turn-key solution. JRG's team take chemical samples from the resource and wellbore and have them analyzed in a laboratory. JRG's team can source and procure a chemical solution from a qualified chemical supplier and can also design the system, either downhole or surface, to inject the chemical. JRG can source the manufacturing, test, install and commission the system before handing it over to the client.



GEOTHERMAL UPSTREAM SERVICES

Project Engineering and Management



High Temperature Plugs and Wellhead Removal Service:

JRG Energy uses proprietary high-temperature packers and plugs to safely replace wellheads with minimal well site equipment. This is accomplished using their proprietary Geothermal packer and plugs with local wireline service companies. JRG's retrievable inflatable packers and plugs can be set on capillary tubing, coil tubing, or drill pipe. The inflation principle allows them to be set and retrieved in obstructed or damaged casing, while the easy-latch, fish-neck and failsafe deflation mechanism allows for fast and effective retrieval using standard slickline tools without jeopardizing sealing pressure.

JRG Energy offers a turn-key solution to removing wellheads and replacing them as well as a system to isolate zones, temporarily plug, or plug and abandon wells using conventional wireline. Offering safe wellhead removal and replacement services provides the customer peace of mind with their steamfield maintenance needs.

Size and Dimensions				
Outer Diameter	2.75 in 70 mm	3.5 in 89 mm	4.5 in 114 mm	5.5 in 140 mm
Inner Diameter	1.68 in 42.6 mm	1.77 in 45 mm	2.48 in 63 mm	2.60 in 66 mm
Overall Length	93.5 in 2375 mm	93.5 in 2375 mm	95.12 in 2416 mm	95.12 in 2416 mm
Sealing Element Length	63.0 in 1600 mm	63.0 in 1600 mm	63.0 in 1600 mm	63.0 in 1600 mm
Max Seal ID	6.9 in 175 mm	8.66 in 220 mm	11.0 in 280 mm	12.6 in 320 mm

Applications:

- Wellhead Change / Repairs
- Well Abandonments
- Zone Isolation

Features:

- 340 bar max differential pressure ratings
- 150°C Temperature ratings
- 45" to 12.75" casing range
- Double check valve for reliable operation and safety
- Can be set in surface casings, intermediate casing or slotted lines
- Can be set on Capillary, Coil Tubing, Drill Pipe and retrieved on Wireline/Slickline
- Shear pin equalization system to prevent premature deflation and recovery issues

Benefits:

- No quench required for most applications
- Efficient process - set and retrieve in same day
- Cost effective compared to alternatives
- Much safer alternative than existing geothermal options
- Reliable operation using proven technology from the O&G industry
- Flexible service as it can be combined with other services such as broaching, gauge rings or PTS surveys
- Can be run on local service company's wireline equipment
- Less set-up and prep work required for operation resulting in less downtime for wells

GEOTHERMAL DOWNSTREAM SERVICES

Project Engineering and Management

Direct Heat Feasibility Study and

Implementation: JRG Energy works with governments, cities, private and commercial entities to manage the development of their direct use application. From geology, to slim hole exploration, engineering, production drilling supervision, to the design and construction of the surface equipment, JRG can provide turn-key direct use feasibility studies and project management.

Power Station Engineers:

JRG Energy's network of Engineers can custom design and engineer a power station that best suits your resource. JRG has experience working with developers on maximizing power to the grid by engineering scalable, cost-effective power stations for any size project.

Steamfield Design and Procurement:

JRG Energy understands your reservoir, land use, the position of wells, and can strategically map out and design well pads to maximize your steamfield. In addition, JRG's team and partners can recommend, consult, project manage or procure your steamfield equipment directly, as well as manage comprehensive well maintenance programs.

Bid and Tender Review and Management:

JRG Energy's network of Project Managers and Engineers will work with your team to outline, define, engineer, solicit and review your Tender Management process. JRG can work with your team to manage expectations and ensure all country specific laws and financial regulations are included



GEOTHERMAL DOWNSTREAM SERVICES

Project Engineering and Management



Construction Management and Plant

Commissioning: Specific geothermal power plant configurations must match the heat resource to maximize its potential but should also take into account a variety of other criteria including, local conditions and requirements as well as the needs of a community. JRG Energy has the team in place to provide construction planning to plant commissioning services and everything in-between.

Peer Review: JRG Energy has an international network of partners with diverse experience that will provide the peer review consulting needs to justify and confirm articles or research is ready for publishing.

Quality Management Control and

Assurance: JRG Energy offer trained and certified HSE professionals that can customize an HSE and Quality Management program that fits your company sector and assist with, or comply to the API Quality Management Certification process.

Contract and Financial Management:

JRG Energy offers strategic consulting services focused on contract and financial management. JRG Energy begins with identifying your objectives, then continues through bidding, negotiating and drafting the terms.

Budget Analysis and Financial Planning:

JRG Energy's network of Financial Advisors are sought after to provide budget analysis and financial planning consulting services. JRG's Team assists with executing the budget, tracking progress and documenting results. Financial and Budget analysis uses the output from JRG's financial planning to assess profitability, liquidity, solvency, and stability for organizations and specific projects.



SOLAR AND NATURAL RESOURCES CONSULTING

Project Management, Supervision, and Execution

Utility Solar Services:

JRG Energy provides detailed feasibility studies to identify optimal utility, commercial, residential and agricultural scale solar power production capabilities. This includes resource assessment, land use recommendations, panel and layout-design and project management from concept to installation for both developed and emerging economies.

JRG Energy also offers solar power consulting, training and education services.



Commercial Solar Panel Installation



Water Irrigation System

Natural Resources:

JRG Energy's team can assist you in responding to the water resource management challenges, including, local drinking water, large scale catchment management for water supply, irrigation water needs, hydropower schemes, flood and erosion control and protection of aquatic systems for wildlife.

We can provide you with efficient and sustainable solutions to these issues that are aimed at optimizing natural flows in rivers and groundwater sources, engineered aquifer systems, rainwater collection systems, or by implementing water resource management practices to meet the various competing needs for water.



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