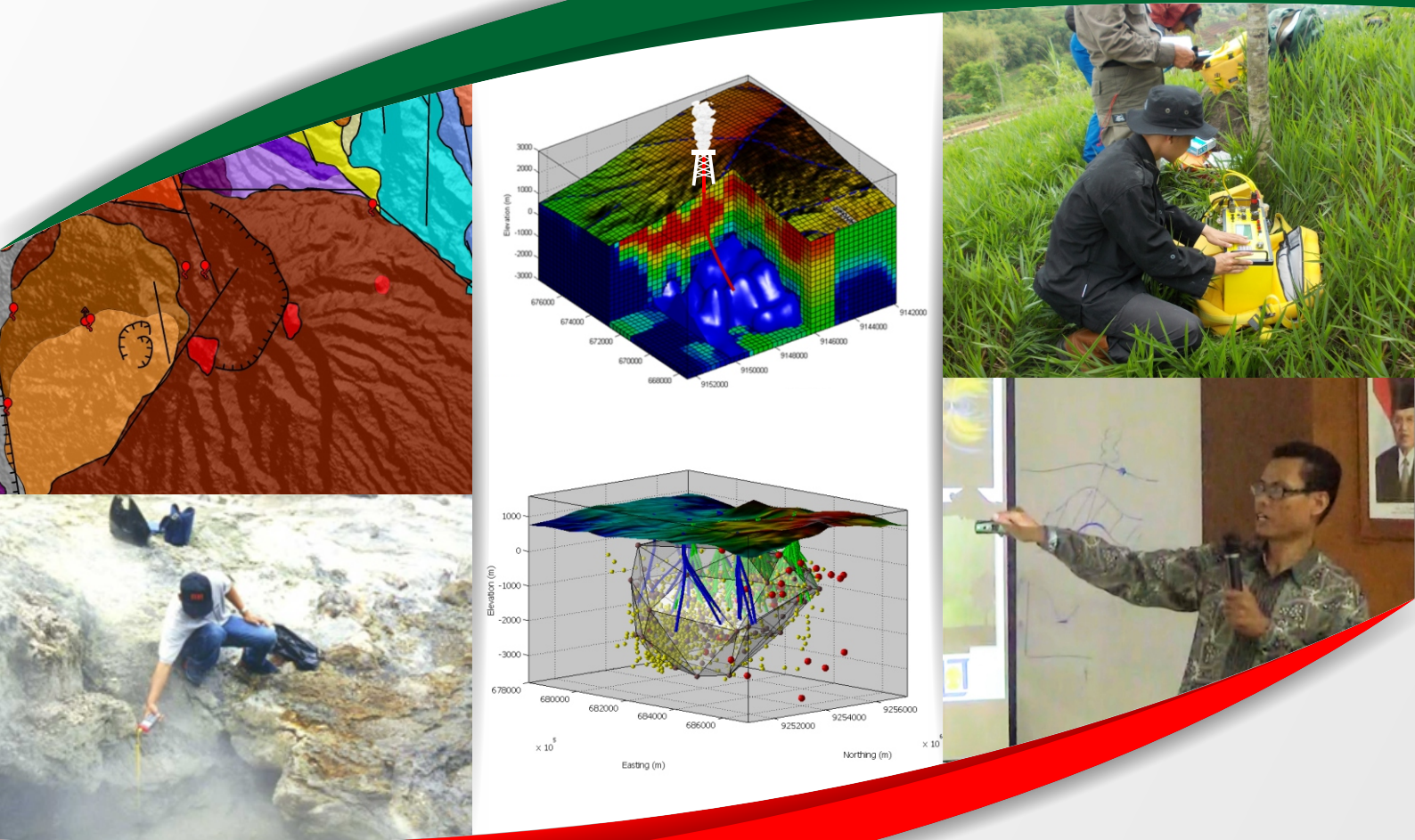# NewQuest
GEOTECHNOLOGY

For Better Exploring the Earth Resources

INSPIRING - INTEGRITY - PARTNERSHIP

www.newquest-geotechnology.com

COMPANY
PROFILE

INTRODUCTION

PT NewQuest Geotechnology, a service company established since 2011, exists to help people better understand the earth's resources systems using appropriate technologies. We offer geotechnology services to explore earth resources (geothermal, petroleum, mineral resources), solve geotechnical and environmental problems, and provide professional training courses in mastering the concept of earth resources and other related technologies.

VISION & MISSION

PT NewQuest Geotechnology has vision **"To be a leading and pioneering company in providing enhanced geotechnology for helping partners in better exploring the earth resources"**.

PT NewQuest Geotechnology is committed:
- Provide enhanced geotechnology for exploring geothermal, petroleum and mineral resources.
- Provide proper geotechnology for solving geotechnical and environmental problems.
- Develop and provide softwares for helping engineers and geoscientists in better understanding the earth resources system.
- Provide better training courses in mastering the concepts of the earth resources system and the proper related geotechnology.

SERVICES

Geothermal Exploration Packages
- Reconnaissance Study
- Preliminary Survey
- Pre-Feasibility Study
- Feasibility Study

Geological Mapping
- Remote Sensing Analysis
- Field Observation & Lab Analysis
- Geological Model & Interpretation

Geochemical Studies
- Fluid Sampling & Lab Analysis
- Geochemical Model & Interpretation
- Scaling & Corrosion Analysis

Geophysical Survey
- MT-TDEM Survey
- Gravity Survey
- Magnetic Survey
- Micro EarthQuake (MEQ) Survey
- Geophysical Model & Interpretation

Conceptual Model & Resource Assessment
- Reconnaissance Study
- Preliminary Survey

- Exploration Survey
- Feasibility Study

Drilling Consultancy
- Well Targeting
- Well Design
- Drilling Engineering
- Drilling Operation & Optimization
- Drilling Project Management

Well Testing & Evaluation

Reservoir Modeling & Simulation

Reservoir Monitoring
- Physical & Chemical Monitoring
- Well Monitoring
- Sustainability Assessment

Engineering Design
- Infrastructure
- Surface Facilities
- Electrical System

Environmental Impact Assessment

Economic & Financial Evaluation

Software Development

Professional Training Cources

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OUR TEAM

PT NewQuest Geotechnology has 20 permanent personnel consist of geologist, geochemist, geophysicst, drilling engineer, and reservoir engineer. This team is supported by technical advisors as the following:

Dr. Eng. Yunus Daud, Dipl. Geotherm. Tech., M.Sc. (Lead Geothermal Expert)

Dr. Yunus Daud is a prominent geothermal expert in Indonesia with more than 25 years experiences in geothermal exploration, resource assessment , well targeting as well as drilling evaluation of geothermal area. He was also served as Head of Master Program of Geothermal Exploration in Universitas Indonesia.
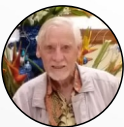
Prof. Manfred P. Hochstein (Senior Geothermal Expert)

Prof. Hochstein is professor of geothermal energy at Auckland University New Zealand with more than 50 years experience in many geothermal field arround the world. He has studied many geothermal field in Indonesia since 1970 became a mentor for many geothermal expert in Indonesia.

Errol Anderson, M.Sc. (Senior Geophysicist)

Mr. Errol Anderson is an expert on geothermal resource analyst with emphasis on geophysical data optimization and interpretation with more than 35 years experience.

Dr. Surya Darma, M.B.A. (Senior Geothermal Expert)

Dr. Surya Darma, has over 30 year experiences in geothermal, power and energy sector with specialties in providing strategy of geothermal development, operation and monitoring stages.. From 2006 to 2009, he served as a Director of Operation of Pertamina Geothermal Energy.

Ir. Suwijanto Tarmidi (Senior Remote Sensing Expert/ Geologist)

Ir Suwijanto Tarmidi is an expert in geology and remote sensing technology for geothermal exploration in Indonesia with more than 30 years experiences. He was a prominent researcher of Indonesian Institute of Sciences specialized for geological imaging and remote sensing.

Dr. Fajar Hendrasto, Dipl. Geotherm. Tech., M.Sc. (Senior Geologist)

Dr. Fajar Hendrasto is a noted expert and academician of geology for geothermal in Indonesia for more than 20 years. He has been involved in various projects in geology for geothermal hydrogeology and petroleum.

Dr. Zainal Abidin, Dipl. Geotherm. Tech., M.Si. (Senior Geochemist)

Dr. Zainal Abidin is a proficient expert in the field of geochemistry for geothermal in Indonesia with more than 30 years in geochemistry and isotope technology for geothermal. Dr. Abidin was a researcher in hydrology in National Nuclear Agency (BATAN) since 1983.

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Dr. M Syamsu Rosid, M.T. (Senior Geophysicist)

Dr. Syamsu Rosid is a prominent academician and expert in Indonesia with more than 25 years experiences in geophysical method, especially in potential geophysics, seismic, as well as electromagnetic method.

Ir. Yudi Hartono (Senior Drilling Expert)

Ir. Yudi Hartono is an expert in managing cost effective drilling with over 29 years experiences. During his service for Star Energy he manages over 13 geothermal drilling preparation and execution at Wayang Windu, Jailolo and Halmahera Island.

Ir. Ashadi, M.T. (Senior Drilling and Well Testing Expert)

Ir. Ashadi started first career as field and drilling engineer at Schlumberger Company with main responsibility is to execute many survey, drilling and logging program. Since 2012, he manage 11 geothermal drilling project, from well planning,-design-execution at Chevron Geothermal Indonesia.

Prof. Dr.-Ing. Ir. Nasruddin, M.Eng. (Senior Mechanical Engineering)

Prof Nasruddin is distinguished lecture at Universitas Indonesia and power plant expert with 24 years experiences in optimization of energy systems. His research is focusing on improving steam power plant performance and environmental impact by installing dual pressure bottoming binary cycle at geothermal power plant.

Prof. Widjojo Adi Prakoso, M.Sc., Ph.D (Senior Civil Engineering)

Prof Widjojo is head of Geotechnical Engineering Laboratory, at Universitas Indonesia and professional practice with for many aspects of geotechnical engineering including foundations, earth retaining structures, slope stability, soil/structure interaction, laboratory testing, and construction engineering.

OUR FACILITIES

Our services is supported by comprehensive laboratory located in PT NewQuest Geotechnology (NQG) and our collaborator institutions as the following:

1. Remote Sensing Laboratory (NQG)
2. Petrography Analysis Laboratory (PSDMBP)
3. XRD Analysis Laboratory (PSG)
4. Thermoluminescence Dating Lab. (PSDMBP)
5. Water Chemistry Analysis Laboratory (BATAN)
6. Gas Chemistry Analysis Laboratory (BATAN)
7. Stable Isotopes Analysis Laboratory (BATAN)
8. Gravity Data Processing & Modeling Lab. (NQG)
9. Magnetic Data Processing & Modeling Lab. (NQG)
10. MT Data Advanced Processing Lab. (NQG)
11. MT 3-D Inverse Modeling Lab. (NQG)
12. 3-D Geothermal Modeling Lab. (NQG)

GEOTHERMAL SURVEY DEPARTMENT

GEOTHERMAL EXPLORATION PACKAGES

Exploration stage is very important step to begin the geothermal development. The target of exploration is to increase the drilling success ratio, hence the integrated science and technology are needed to assess the resources.

▶ Geological Mapping

Geological exploration is the first step of the preliminary reconnaissance. Objective of the geological exploration is to identify the surface manifestations (i.e. fumaroles, thermal springs, steaming ground, mud pools and geysers) in the geothermal prospect area. These geothermal manifestations are plotted in the geological map, completed with geological structures. Lithology, volcano-stratigraphy, and alteration analysis could also be provided to complete the geological model.

▶ Geochemical Studies

Chemical content of geothermal fluid can give us very useful information that can lead to determine the further exploration program of the area. Supported by geological data, this geochemical data can be the guidance to make a recommendation for subsurface exploration. Chemical geothermometer related to the fluid chemistry and the temperature of the reservoir, become the common method used to assess the energy potential from the geothermal prospect area.

▶ Geophysical Surveys

The subsurface image acquired from geophysical data is very important to the exploration stage. The surface manifestation found from the geological and geochemical data can be confirmed to the subsurface condition by analyzing physical parameters, such as: resistivity, density, and microearthquake event from the geophysical data.

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GEOLOGICAL MAPPING

▶ Remote Sensing

We provide analysis of geological structure, fracture density, surface kinetic temperature, rock unit and alteration from remote sensing data. This analysis will be used to guide field verification.

▶ Surface Manifestations

Location of thermal manifestations, such as fumaroles, hot springs, warm ground, are plotted to complete detail geological map. Thus, the appearence of the thermal features could be associated with the presence of geological structures and alteration zones.
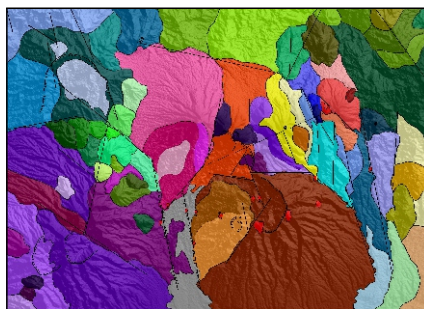
▶ Geological Structure

We provide a characterization of geological structures by combining analysis of remote sensing data and field observations, including the dip and strike. These results are expected to provide guidance in geological assessment.
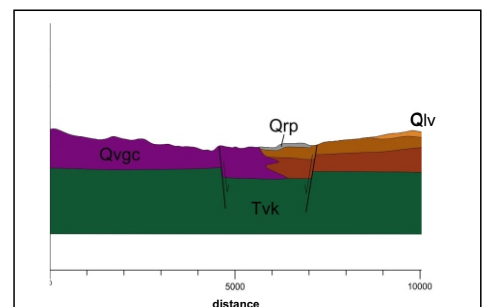
▶ Detailed Geological Condition

Our geologists will provide a more detailed picture of the geological conditions, such as geomorphology, lithology, volcano-stratigraphy, as well as mapping and analysis of alteration zones.
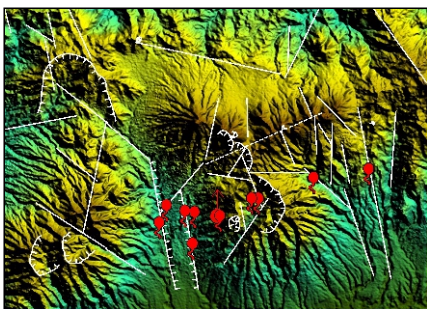
Geological Structure Map   Lithological Map   Geological Model

GEOCHEMICAL STUDIES

▶ **Sampling and Analysis of Water, Gas, and Isotope**

The use of appropriate methods and careful sampling, determine the credibility of geochemical data. Geochemical understanding becomes important to prevent contamination during sampling.

▶ **Chemical Hydrogeology**

Provide information about the water cycle of geothermal system, from recharge to discharge controlled by geological structure.

▶ **Chemical Geothermometry**

Changes in temperature or pressure could affect the equilibrium concentration of all reactive solutes in geothermal fluid. However, it is necessary to select the proper chemical content, because it has a different response of reaction.

▶ **Injection Strategy**

Reservoir conditions, hydrogeology, and permeable zone are important to consider the determination of injection strategy. Because, reinjection process could either maintain the sustainability of production from decrease temperature of reservoir if it is not properly placed.
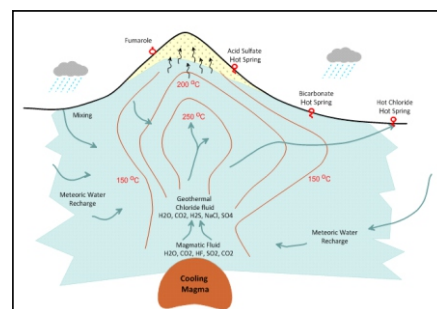
▶ **Geochemical Model**

The results of the chemical content and isotope analysis could be presented to the geochemical models to provide clear visualization of the geothermal system.

Fluids Sampling
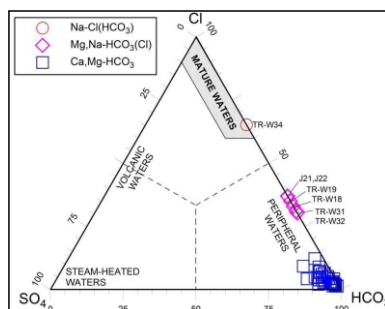
Terniary Diagram

Geochemical Model

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GEOPHYSICAL SURVEY

▶ MT and TDEM Survey

MT is a powerful geophysical method to delineate conductive clay zone overlying a geothermal reservoir. MT has been utilized to guide drilling sites in many geothermal explorations. In addition, TDEM data used to correct static shift effect in MT data.

▶ Gravity Survey

Gravity method is conducted to delineate major subsurface structure in a geothermal field. Gravity data can be combined with other geophysical data, such as MT, to provide a more complete figure of the geothermal system and also to reduce its ambiguity.

▶ Microearthquake Survey

Microearthquake activity that occurred in the area of geothermal could provide relevant information on the geological structure of the subsurface. Permeable zone which is one of the main targets in determining of well, could also be identified by this method.

MT and TDEM Survey

MEQ Survey

Gravity Survey

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MT AND TDEM METHODS

▶ Survey Design

First step of the techniques (i.e. survey design) should be well prepared considering geological and topographical condition, area of target, noise sources, as well as modeling/visualization.

▶ Data Acquisition

A proper way of data acquisition with following standard operational procedure is also important to carry out in order to get high quality data. Understanding the objective of the survey is also needed for planning efficient survey strategy.
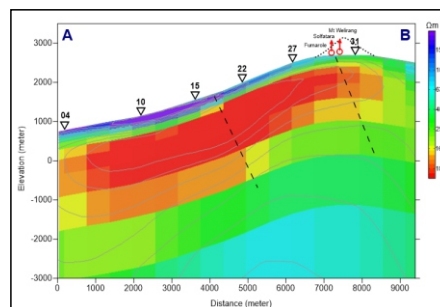
▶ Inversion and Modeling

The main purpose of data processing is to minimize the possible noise and to correct MT data from static shift effect in order to produce high quality MT data that is ready for further modeling. The process consist of time-series analysis, remote reference, fourier transformation and robust processing, cross power selection, and static shift correction.
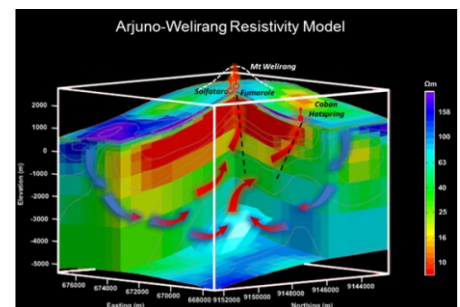
▶ Data Interpretation

The components of geothermal system have correlation with resistivity value, that caused by temperature, fluid content, porosity, and mineral characteristic. MT method, with resistivity parameter, an appropriate technology in delineating geothermal resources, including identification top of reservoir, conductive clay cap distribution, and reservoir boundary. Interpretation of the data is depend on modeling result, so that the standard procedure data acquisition and carefull data processing are very important to produce modeling and interpretation with high level of confidence.
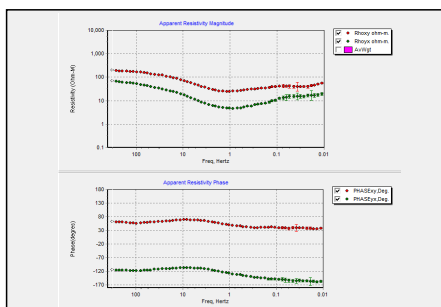
MT Apparent Resistivity & Phase Curve

MT Cross Section from 3D Inversion

MT 3D Modeling and Interpretation

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GRAVITY SURVEY

▶ Survey Design

The survey design is made based on geometry of target, coverage area, topography, and noise source. Accordingly data acquisition, the distribution of the measurement points can be made more effective.

▶ Data Acquisition

Before performing Gravity data acquisition in the field, we perform several steps such as cycling, calibration, and binding the value of gravity, to obtain good measurement results with minimum deviation.

▶ Data Processing

We perform data processing carefully, and use appropriate methods. Started with standard gravity reduction including terrain corrections to obtain a complete Bouguer anomaly. We also develop our own software (i.e. GravPro-X) to perform data reduction and provide with several methods for separating regional and residual anomalies, spectrum analysis, and the second vertical derivative (SVD).

▶ Data Modeling

After doing data processing, gravity data can be modeled to obtain distribution of subsurface density. The method can be performed by forward modeling and inverse modeling.

▶ Data Interpretation

Gravity data could be used to identify the geological setting and geological structure of a geothermal system. To get a more convincing picture of the geothermal system, the gravity data should be combined with other data, such as MT. This step could also reduce the ambiguity of gravity data.

Gravity Data Acquisition
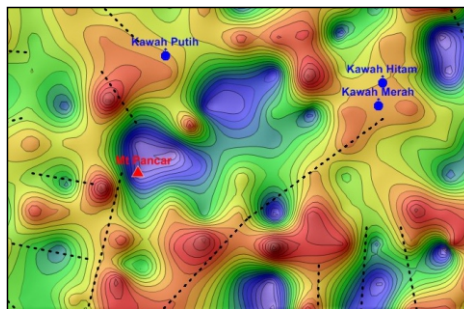
Residual Gravity Anomaly

2D Forward Modeling

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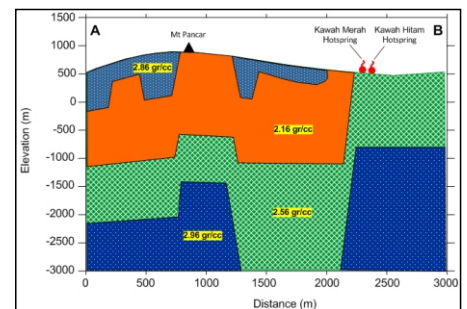
MICROEARTHQUAKE SURVEY

▶ Survey Design

In creating a design for a microearthquake survey (seismometer placement locations), it is necessary to estimate the location of the earthquake (event), such as the presence of geological structures and production and reinjection wells.

▶ Data Acquisition

There are two kinds of tools used in the measurement of Microearthquake (MEQ), namely seismograph data logger and seismometer. The accuracy of a location estimate depends upon a number of factors including:

- the precision of the signal recording equipment,
- the accuracy of the assumed velocity model,
- the suitability of the location estimation technique, and
- the spatial distribution of the seismic sensors.

▶ Data Processing

Noise analysis, picking first arrival, and determination the hypocenter are performed on the stages of microearthquake data processing. The crucial stage is to determine the first arrival of P-wave and S-wave. A few second difference at the time of picking, can change the location of the hypocenter.
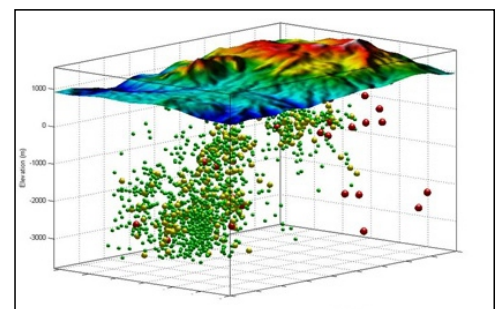
▶ Data Interpretation

Hypocenters distribution could be used as an indicator in determining the permeable zone. More comprehensive analysis could be done by integrating the MEQ data with other geophysical data, such as MT and Gravity.

MEQ Instrumentation
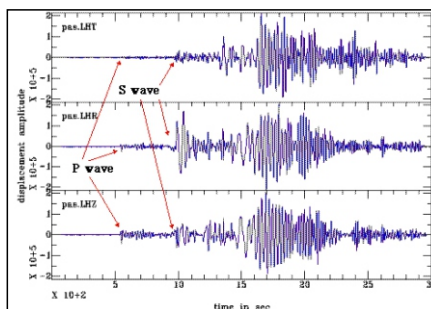
MEQ Raw Data (Arrival Time)

MEQ Modeling

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GEOTHERMAL RESOURCES EVALUATION PACKAGES

▶ Quality Control of Geoscientific Data

Garbage in, garbage out. Geoscience data interpretation results with a high degree of confidence, requires good data quality as well. Quality control of the data obtained in the field is crucial to guarantee that the model will be generated. Quality control can be done by specifying scientific criteria and implement standard procedures for the acquisition and processing of data.

## ▶ Re-Processing and Re-Modeling of Geoscientific Data

If the existing data could not give a strong indication or still have doubts in terms of quality, we can re-processing and re-modeling, in order to improve the quality of data. Which is expected to provide conclusive results.

▶ Resources Assessment

Geothermal resource assessment aims to determine the condition and estimate production capacity of the geothermal system. The assessment was conducted by collaborating the existing data, such as surface exploration data, exploration and production drilling, a.s well as monitoring data, to build a representative conceptual model of the geothermal system

▶ Reservoir Modeling

The data acquired using geoscientific survey (i.e. geophysics, geology, and geochemistry), supported by exploration well data, is evaluated and then simulated to predict the potency and the reserve that can be produced, also how long the geothermal field can produce steam.
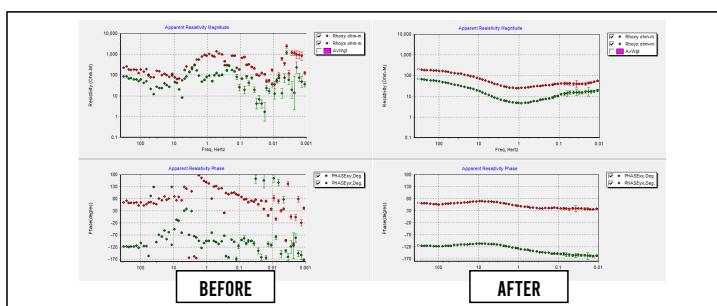
Reprocessing of MT Data
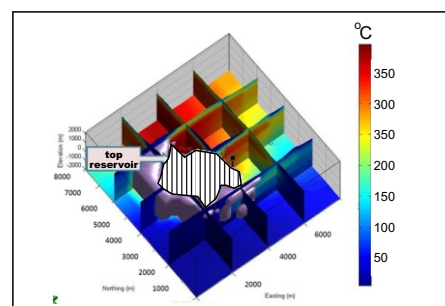
Reservoir Modeling

DRILLING CONSULTANCY

NewQuest Geotechnology provides a complete range of services for geothermal well design and drilling consultancy, including:

▶ Well Targeting

Well targeting is based on the objectives that want to achieve from drilling process. Product are usually presented in drilling prognosis based on the result of 3G (Geology, Geochemistry, and Geophysics) data.

▶ Well Basic Design

This part including well trajectory, casing depth, and casing size selection depends on well target.

▶ Wellsite Design

Optimization of well pad location, drilling facilities and infrastructure development that support drilling process around the well.

▶ Drilling Program

Drilling program is provided including specification on the drilling equipment (tools, fluids, and cementing) and ways to overcome drilling problems.

▶ Drilling Plan and Strategy

Success in the drilling process is not detached from its plan and strategy. A good drilling plans and strategies should pay attention to the following things:

- Budgeting
- Tender & Contracting Plan
- Organization
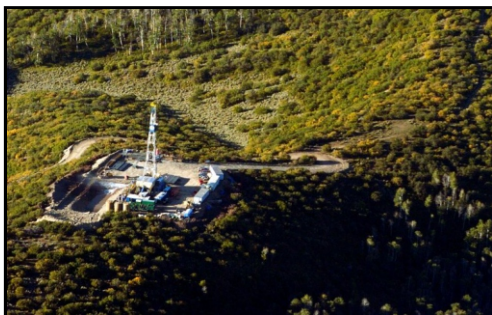
Geothermal Drilling Program

Geothermal Wellhead Pressure Controling

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WELL TESTING AND EVALUATION

Well testing and evaluation is a very important activity to obtain data or information about fluid and rock in reservoir. Several stage of well testing and evaluation, including:

▶ Completion test

This measurement is aimed to determine the depth of the production and feedzones and its productivity.

▶ Heating Up Test

The heating measurements consist of temperature-pressure profiles made at expanding time intervals after stopping injection.

▶ Production Test

Production test (discharge/output test) is aimed to determine:

- Fluid properties in reservoir
- Total mass flowrate and enthalpy from various wellhead pressure
- Steam fraction

▶ Interference Test

One of pressure transient test that commonly used to determine the relationship between wells so that it can give an estimation of its permeability.

Well Testing Equipment

Lip Pressure Well Testing

GEOTHERMAL MONITORING PACKAGES

During the exploration phase, reservoir is in dynamic condition. Many changes happened during the production process and fluid reinjection are being conducted. Many possibilities could be happen, i.e. production decline, scalling problem, overheated steam, which is caused by many factors. Therefore, the monitoring program is urgently needed to observe the changes of reservoir. So that, the stability of production could be controlled.

▶ **Microgravity Technology**

Mass extraction in large enough quantities during the production process can lead to changes the mass balance in the subsurface. These changes can be detected using Microgravity methods conducted periodically at the same location.

▶ **Microearthquakes Technology**

the fluid which is injected back into the subsurface is expected to maintain sustainability, sometimes flowing away from the reservoir. Microearthquake survey can be conducted to monitor the direction of the injected fluid.

▶ **Fluid Chemistry & Isotope Analysis**

Information about the changes that occur in the reservoir during the production process could be discovered by analyzing the chemical content obtained from wells or from the manifestation on the surface.

▶ **Tracer Test**

Tracers are used in geothermal reservoir engineering to determine the connectivity between injection and production wells. This information would be useful for the reservoir engineer to build reservoir models and give recommendation of program associated with reservoir management.
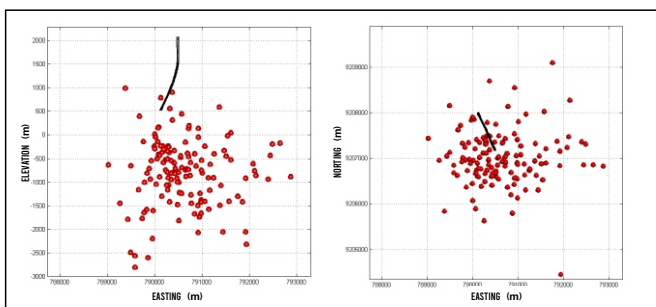
Cross Section of MEQ Event in Reservoir   Connectivity between Injection and Production Well
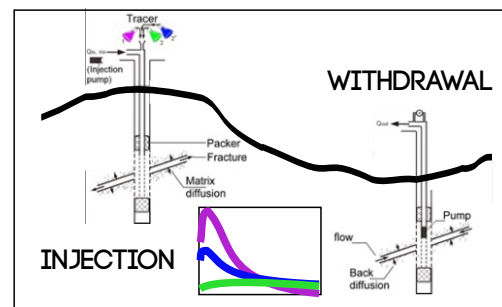
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GEOTECHNICAL SURVEY DEPARTMENT

Geotechnical Survey department is a part of NewQuest Geotechnology which has a wide range areas of work in the field of geotechnical engineering, mineral exploration, and environmental studies. We provide a proper technology to detect subsurface object accurately.

▶ Geotechnical Study

Our geotechnical engineers assist clients to achieve best value from their projects, whilst minimizing the risks of delayed completion, poor performance of the asset, financial loss and consequent impact. Our products in geotechnical study covers:

- Subsurface Utility Detection (pipes, cables, sewer, etc.)
- Downhole Seismic Logging (Shear Wave Velocity Logging)
- Bedrock Identification
- Investigation of Building Foundation

▶ Environmental Investigation

Our integrated geoscience expertise also provide environmental investigation which includes:

- Cavities Investigation
- Delineation of Contaminated Waste Disposal
- Sea Water Intrusion Investigation
- Archaelogical Investigation
- Forensic Investigation

▶ Mineral Exploration

We also provide services technology in mineral exploration to assist our clients to get best geoscientific data in exploration industry, improving exploration efficiency, helping reduce exploration risk on mineral exploration. The technology could be applied in:
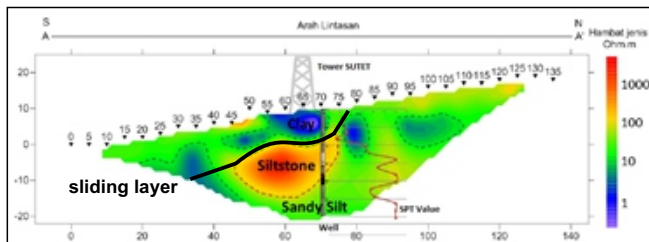
- Coal Mining
- Gold & Silver Mining
- Nickel & Bauxite Mining
- Iron Mining

RESISTIVITY & INDUCED POLARIZATION (IP)

Geoelectrical Imaging is non destructive geophysical method which observe rock resistivity as contrast properties to detect subsurface object. The method conducted by injecting artificial currents into the ground and then measuring the potential difference resulting from the current. The method could be applied to these following cases:

- Cavities Investigation
- Underground River Investigation
- Landslide Study
- Mineral Exploration

Landslide Delineation
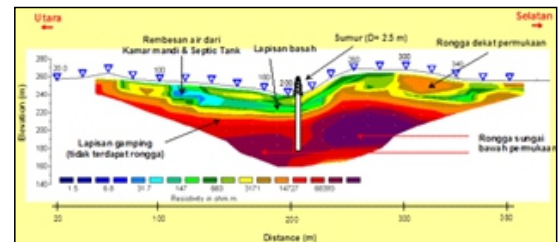
Underground River & Cavity

GROUND PENETRATING RADAR (GPR)

Ground Penetrating Radar (GPR) is an active method that utilize rock dielectric as contrast properties to detect object. The concept is using electromagnetic waves which works by utilizing its reflectance signal. GPR system has a transmitter circuit and receiver circuit Penetration of GPR depends on the frequency used at the transmitter and receiver. The deeper the target, the lower the frequency used. GPR method can be applied to these following cases: Concrete inspection, Utility detection, Geological survey, Archaeological survey, Forensic, Mining, etc.
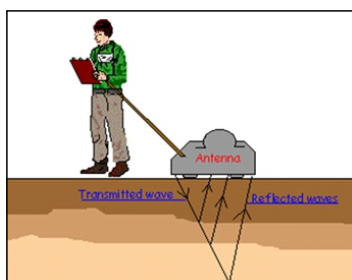
Concept of GPR Method

GPR Data Acquisition
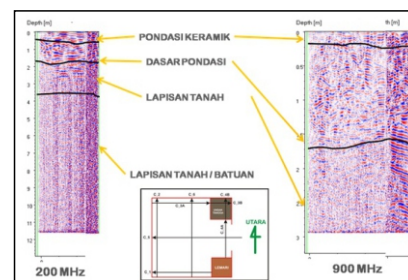
Subsurface Soil Structure

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DOWNHOLE SEISMIC LOGGING

DownHole seismic logging is an active method that utilize rock density and velocity as contrast properties to detect object. The concept is generating artificial shear wave at the surface and measure travel time of the P and S wave to certain depth.
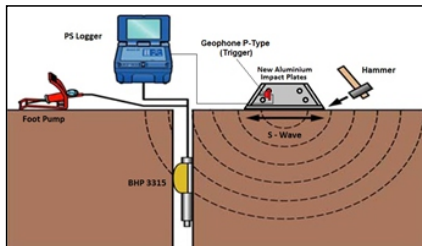
Downhole Seismic Logging Method

Data Acquisition
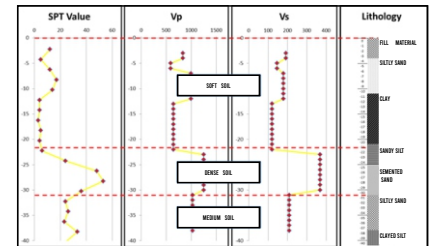
Result of Downhole Seismic Logging

TIME DOMAIN ELECTROMAGNETIC (TDEM)

TDEM is an active method that utilize rock resistivity as contrast properties to detect object. This method works by inducing magnetic field into the earth and measuring magnetic field response decayed by time. Result from this method is resistivity sounding curve that describes subsurface rock resisitivity until 500m depth.

TDEM method can be applied to these following cases:

- Groundwater Investigation.
- Bedrock Identification.
- Mineral deposit exploration.

In order to fulfill clean water necessity, TDEM method can be used to find deep aquifer.
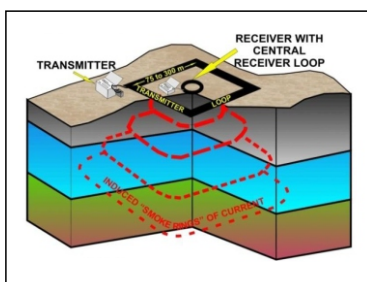
Concept of TDEM Method

TDEM Data Acquisition

1D TDEM Modeling

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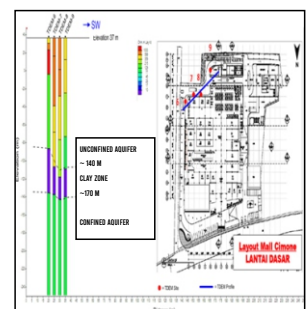
SOFTWARE DEVELOPMENT DEPARTMENT

Software Development Department conduct research and development related to software in order to help geoscientists and engineers analyzing subsurface data.

GeoSlicer-X

GeoSlicer-X is a software developed to help geoscientists and engineers to analyze data in the form of 3-dimensional model. The software is used to perform 3-D modeling of geophysical data such as magnetotelluric, CSAMT, gravity, geoelectric, and magnetic data. In addition, this software can also be used to model the geological data, such as the distribution of rocks in a region. This software is interactive and user friendly and can generate static images (still) or dynamic (animated) images
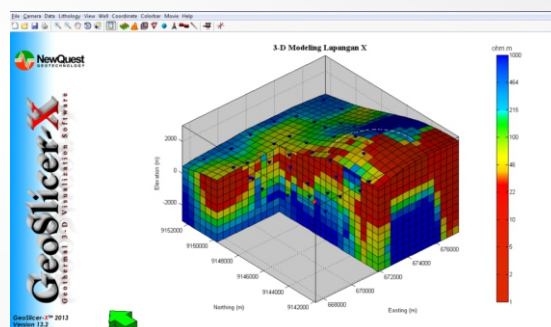
MT3DInv-X
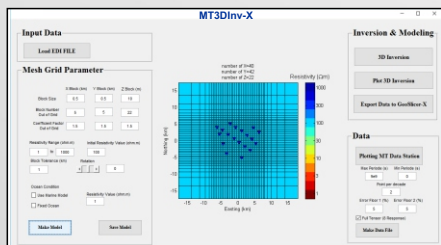
This software is used to perform 3-D inversion of the Magnetotelluric (MT) data. MT3DInv-X can be used to facilitate in grid setting to perform 3-D inversion of MT data. The output can be integrated with 3-D visualization software, GeoSlicer-X. The result of 3-D Inversion of MT data visualized using the GeoSlicer-X software can provide information of the 'real' condition of the subsurface.

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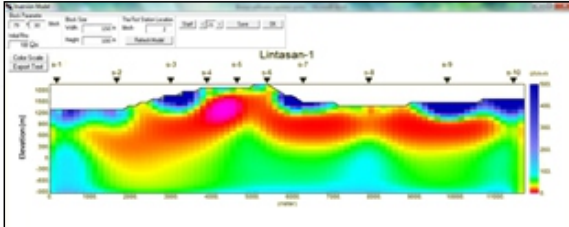
MT2DInv-X

This software is used to perform 2-D inversion of the Magnetotelluric data. The input data for this software are period, rho TM, phase TM, rho TE, and phase TE

MT2DFor-X

This software is used to perform forward modeling of Magnetotelluric (MT) data. From 2-D model created using this software, the data output will be obtained in the form of rho and phase.
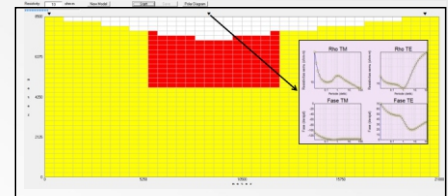
StaticShifter-X
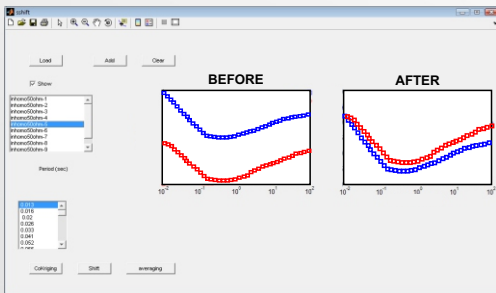
This software is used to correct the static shift effect in Magnetotelluric (MT) data. Commonly, this curve shift correction process is only done by using TDEM curve. However, using this software, MT curve correction can be performed using a method based on geostatistical data processing. There are two geostatistical methods used by this software, namely CoKriging and Averaging.

GravPro-X

This software is developed for gravity data processing from raw data to Complete Bouguer Anomaly including digital terrain correction. Moreover, the software can also perform regional and residual separation process, Second Vertical Derivative (SVD) process, spectrum analysis, and 2-D modeling of gravity data.

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TRAINING DEPARTMENT
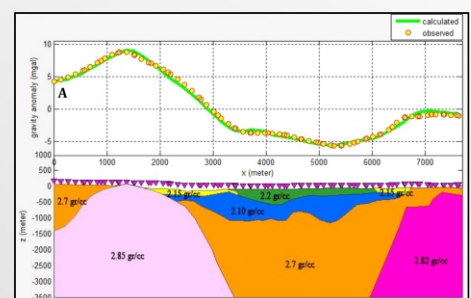
▶ **Geothermal System and Exploration Technology**

This training course will provide comprehensive knowledge regarding the geothermal system and geoscience (geology, geochemistry and geophysics) technology for exploring the geothermal resources. Well targeting and drilling prognosis are also included to the discussion. Emphasis will be put on how to do the proper geoscientific exploration so that the drilling risk can be decreased.

▶ **Magnetotelluric-Time Domain Electromagnetic Method Training**

This training course will provide comprehensive knowledge about Magnetotelluric and Time Domain Electromagnetic method and its powerfulness in exploring geothermal resources. The discussion will be about the fundamental concept, data acquisition, processing, modeling and interpretation. Emphasis will be put on how to properly apply the method in geothermal exploration in order to obtain the less-ambiguous subsurface condition.

▶ **Gravity Method for Geothermal Exploration Training**

This training course will provide comprehensive knowledge about gravity method, including fundamental concept, data acquisition, processing, modeling and interpretation. Emphasis will be put on proper gravity method for geothermal exploration.

▶ **MEQ Method Training**

This training course will provide comprehensive knowledge about Micro-Earthquake (MEQ) method, including fundamental concept, data acquisition, processing, modeling and interpretation. Emphasis will be put on proper MEQ method for geothermal exploration and monitoring.

▶ **Resource Assessment & Prospect Evaluation**

This training course will provide comprehensive knowledge about assessment of geothermal resources based on geoscientific (geology, geochemistry, and geophysics) data, construction of geothermal conceptual model, delineation of prospect area and potential assessment for electricity generation.

▶ **Geotechnical & Power Plant Development**

This training course will provide comprehensive knowledge about geotechnical analysis of power plant structure foundation, design of power plant facility, and power plant engineering system.

▶ **Geothermal Regulation and Tender Preparation**

This training course will provide comprehensive knowledge about the regulation that rule the geothermal development and also how to prepare the tender process for both of the government who open the tender and also the developer who participate on the tender process.

▶ **Special Topic (On Request by Client)**

This training course will be provided based on client request on any geothermal aspects.

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Mt. Geureudong

Sungai Kelah

Lojing

Ulu Slim

Tawau

Sorik Marapi

Kepahiang

Lawang

Talamau

Tandikat

Muara Laboh

Malintang

Tanjung Sakti

Randau Dedap

Cisolok-Cisukarame

Tangkuban Parahu

Rajabasa

Kaldera Danau Banten

Tampomas

Guci

Darajat

Dieng

Telaga Ranu

Bromo

Blawan-IJen

Gede Pangrango

Patuha

Ungaran

Telaga Ngebel

Wayang Windu

Raung

Mt. Wilis

Krucil Tiris

![NewQuest Geotechnology logo]

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G E O T E C H N O L O G Y

For Better Exploring the Earth Resources

Project Location

Indonesia = 40 areas
Malaysia   =   4 areas
Total   = 44 areas

Bora-Pulu

Jailolo

Hamiding

Songa-Wayaua

Tulehu

Oka Ile Ange

Atadei

Mt. Sirung

Ulumbu

Sokoria

Mataloko

No	Project	Partners	Year
A. Geothermal			
1	Benefit and Cost Analysis Study for Changes of Development Scheme of Sorik Marapi Geothermal Area (Including Resources, Power Plant System, Electrical System, Legal, and Financial Studies)	PLN (Persero) Kantor Pusat	2019
2	Remote Sensing Analysis, MT Reprocessing and 3D Modeling of Hamiding Geothermal Working Area	Star Energy	2018
3	Pre Feasibility Study of Atadei Geothermal Working Area (Remote Sensing Analysis, Geological Mapping (Rock Sampling & Lab Analysis), Geochemical Studies (Water/Gas Sampling & Lab Analysis), Geophysical Survey (Gravity, Magnetic, MT, TDEM, MEQ), Well Data Analysis, Conceptual Modeling, Potential Calculation, Well Targeting, Basic Drilling Design, Power Plant Preliminary Design, Economic Analysis)	PLN (Persero) Kantor Pusat	2018
4	Pre Feasibility Study of Songa-Wayaua Geothermal Working Area (Remote Sensing Analysis, Geological Mapping (Rock Sampling & Lab Analysis), Geochemical Studies (Water/Gas Sampling & Lab Analysis), Geophysical Survey (Gravity, Magnetic, MT, TDEM, MEQ), Conceptual Modeling, Potential Calculation, Well Targeting, Basic Drilling Design, Power Plant Preliminary Design, Economic Analysis)	PLN (Persero) Kantor Pusat	2018
5	Pre Feasibility Study of Mt. Tangkuban Perahu Geothermal Working Area (Remote Sensing Analysis, Geological Mapping (Rock Sampling & Lab Analysis), Geochemical Studies (Water/Gas Sampling & Lab Analysis), Geophysical Survey (Gravity, Magnetic, MT, TDEM, MEQ), Well Data Analysis, Conceptual Modeling, Potential Calculation, Well Targeting, Basic Drilling Design, Power Plant Preliminary Design, Economic Analysis)	PLN (Persero) Kantor Pusat	2018
6	Deep MT Data Acquisition, Processing, and 3D Modeling on North Sumatera	Utrecht Univ.	2018
7	Detailed Pre Feasibility Study Report Services of Bora-Pulu Geothermal Prospect Area (Remote Sensing Analysis, Geochemical Studies, Reprocessing of Gravity & MT Data, Conceptual Modeling, Potential Calculation, Well Targeting)	P3TKEBTKE - ECI - GWDC	2018
8	Preparation of Work Program and Development Plan Proposal of Kepahiang Geothermal Working Area (Remote Sensing Analysis, Geological & Geochemical Studies, Reprocessing of Geophysical Data, Conceptual Modeling, Potential Calculation, Planning of Exploration Program, Well Targeting, Basic Power Plant Preliminary Design, and Economic Analysis)	PLN (Persero) Kantor Pusat	2017
9	Preparation of Work Program and Development Plan Proposal of Kaldera Danau Banten Geothermal Working Area (Remote Sensing Analysis, Geological & Geochemical Studies, Reprocessing of Geophysical Data, Conceptual Modeling, Potential Calculation, Planning of Exploration Program, Well Targeting, Basic Power Plant Preliminary Design, and Economic Analysis)	PLN (Persero) Kantor Pusat	2017
10	Preparation of Work Program and Development Plan Proposal of Oka Ile Ange Geothermal Working Area (Remote Sensing Analysis, Geological & Geochemical Studies, Reprocessing of Geophysical Data, Conceptual Modeling, Potential Calculation, Planning of Exploration Program, Well Targeting, Basic Power Plant Preliminary Design, and Economic Analysis)	PLN (Persero) Kantor Pusat	2017
11	Preparation of Work Program and Development Plan Proposal of Mt. Sirung Geothermal Working Area (Remote Sensing Analysis, Geological & Geochemical Studies, Reprocessing of Geophysical Data, Conceptual Modeling, Potential Calculation, Planning of Exploration Program, Well Targeting, Basic Power Plant Preliminary Design, and Economic Analysis)	PLN (Persero) Kantor Pusat	2017
12	Preparation of Work Program and Development Plan Proposal of Mt. Ungaran Geothermal Working Area (Remote Sensing Analysis, Geological & Geochemical Studies, Reprocessing of Geophysical Data, Conceptual Modeling, Potential Calculation, Planning of Exploration Program, Well Targeting, Basic Power Plant Preliminary Design, and Economic Analysis)	PLN (Persero) Kantor Pusat	2017

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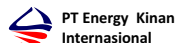| No	Project	Partners	Year
13	Preparation of Work Program and Development Plan Proposal of Bora Pulu Geothermal Working Area (Remote Sensing Analysis, Geological & Geochemical Studies, Reprocessing of Geophysical Data, Conceptual Modeling, Potential Calculation, Planning of Exploration Program, Well Targeting, Basic Power Plant Preliminary Design, and Economic Analysis)	PLN (Persero) Kantor Pusat	2017
14	Preparation of Work Program and Development Plan Proposal of Mt. Geureudong Geothermal Working Area (Remote Sensing Analysis, Geological & Geochemical Studies, Reprocessing of Geophysical Data, Conceptual Modeling, Potential Calculation, Planning of Exploration Program, Well Targeting, Basic Power Plant Preliminary Design, and Economic Analysis)	PLN (Persero) Kantor Pusat	2017
15	Preparation of Work Program and Development Plan Proposal of Cisolok Cisukarame Geothermal Working Area (Remote Sensing Analysis, Geological & Geochemical Studies, Reprocessing of Geophysical Data, Conceptual Modeling, Potential Calculation, Planning of Exploration Program, Well Targeting, Basic Power Plant Preliminary Design, and Economic Analysis)	PLN (Persero) Kantor Pusat	2017
16	Preparation of Work Program and Development Plan Proposal of Guci Geothermal Working Area (Remote Sensing Analysis, Geological & Geochemical Studies, Reprocessing of Geophysical Data, Conceptual Modeling, Potential Calculation, Planning of Exploration Program, Well Targeting, Basic Power Plant Preliminary Design, and Economic Analysis)	PLN (Persero) Kantor Pusat	2017
17	Preparation of Work Program and Development Plan Proposal of Telaga Ngebel Geothermal Working Area (Remote Sensing Analysis, Geological & Geochemical Studies, Reprocessing of Geophysical Data, Conceptual Modeling, Potential Calculation, Planning of Exploration Program, Well Targeting, Basic Power Plant Preliminary Design, and Economic Analysis)	PLN (Persero) Kantor Pusat	2017
18	Preparation of Work Program and Development Plan Proposal of Mt. Wilis Geothermal Working Area (Remote Sensing Analysis, Geological & Geochemical Studies, Reprocessing of Geophysical Data, Conceptual Modeling, Potential Calculation, Planning of Exploration Program, Well Targeting, Basic Power Plant Preliminary Design, and Economic Analysis)	PLN (Persero) Kantor Pusat	2017
19	Preparation of Work Program and Development Plan Proposal of Mt. Gede Pangrango Geothermal Working Area (Remote Sensing Analysis, Geological & Geochemical Studies, Reprocessing of Geophysical Data, Conceptual Modeling, Potential Calculation, Planning of Exploration Program, Well Targeting, Basic Power Plant Preliminary Design, and Economic Analysis)	PLN (Persero) Kantor Pusat	2017
20	Preparation of Work Program and Development Plan Proposal of Telaga Ranu Geothermal Working Area (Remote Sensing Analysis, Geological & Geochemical Studies, Reprocessing of Geophysical Data, Conceptual Modeling, Potential Calculation, Planning of Exploration Program, Well Targeting, Basic Power Plant Preliminary Design, and Economic Analysis)	PLN (Persero) Kantor Pusat	2017
21	Study of Potential Impact of Exploration Drilling to Kelimutu Lakes of Sokoria Geothermal Working Area (Remote Sensing Data Analysis, Geochemical & Isotope Data Analysis, MT & Gravity Analysis)	KS Orka	2017
22	Evaluation of Feasibility Study Project in Ulumbu Geothermal Fields, Flores-NTT (Review of Geological-Geochemical-Geophysical Studies, Well Data Analysis, Review of Conceptual Modeling & Potential Calculation, as well as Evaluation of Well Targeting)	PLN (Persero) Pusenlis	2017
23	Evaluation of Feasibility Study Project in Mataloko Geothermal Fields, Flores-NTT (Review of Geological-Geochemical-Geophysical Studies, Well Data Analysis, Review of Conceptual Modeling & Potential Calculation, as well as Evaluation of Well Targeting)	PLN (Persero) Pusenlis	2017

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No	Project	Partners	Year
24	Remote Sensing Analysis (Geological Structure & Volcanostratigraphy), Geochemical Studies, Reprocessing of Gravity, MT, & MEQ Data, Conceptual Modeling, and Potential Calculation of Ulumbu Geothermal Field	PLN (Persero) Pusenlis	2016
25	Resource Assessment & Well Targeting of Tangkuban Parahu Geothermal Area (Remote Sensing Analysis, Geochemical Studies, Reprocessing of Gravity, Magnet, & MT Data, Additional MT Survey, Conceptual Modeling, Potential Calculation, Well Targeting)	Indonesia Power	2016
26	Study of Geothermal Resource based on 2 Slim Hole Drilling Result of Blawan – Ijen Geothermal Working Area	Medco Cahaya Geothermal	2016
27	MT and Geochemical Survey of Malintang Preliminary Survey Assignment Area	Hitay Lawang Energy	2016
28	Project Management of Raung Hitay Preliminary Survey Assignment Area (Geological Mapping, Geochemical Studies, Geophysical Survey, Conceptual Modeling, Potential Calculation)	Hitay Runcing Energy	2015
29	Project Management of Krucil-Tiris Hitay Preliminary Survey Assignment Area (Geological Mapping, Geochemical Studies, Geophysical Survey, Conceptual Modeling, Potential Calculation)	Hitay Rawas Energy	2015
30	Re-processing MT, 3D Modeling, Interpretation, and Resources Evaluation of Blawan-Ijen Geothermal Area (Remote Sensing Analysis, Geochemical Studies, Reprocessing of MT Data, Additional MT & Gravity Survey, Conceptual Modeling, Potential Calculation, & Well Targeting)	Medco Cahaya Geothermal	2015
31	2D Resistivity Geophysics Survey Services of Darajat Geothermal Field	Chevron	2015
32	Integrated Geoscientific Data Analysis and Interpretationon of Tandikat Preliminary Survey Assignment Area (Remote Sensing Analysis, Geochemical Studies, Reprocessing & 3D Modeling of Geophysical Data, Conceptual Modeling, & Potential Calculation)	Hitay Balai Kaba Energy	2014
33	Integrated Geoscientific Data Analysis and Interpretationon of Talamau Preliminary Survey Assignment Area (Remote Sensing Analysis, Geochemical Studies, Reprocessing & 3D Modeling of Geophysical Data, Conceptual Modeling, & Potential Calculation)	Hitay Green Energy	2014
34	Integrated Geoscientific Data Analysis and Interpretationon of Tanjung Sakti Preliminary Survey Assignment Area (Remote Sensing Analysis, Geochemical Studies, Reprocessing & 3D Modeling of Geophysical Data, Conceptual Modeling, & Potential Calculation)	Hitay Tanjungsakti	2014
35	Integrated Geoscientific Data Analysis and Interpretationon of Lawang Preliminary Survey Assignment Area (Remote Sensing Analysis, Geochemical Studies, Reprocessing & 3D Modeling of Geophysical Data, Conceptual Modeling, & Potential Calculation)	Hitay Lawang Energy	2014
36	Integrated Geoscientific Data Analysis and Interpretationon of Dingin Preliminary Survey Assignment Area (Remote Sensing Analysis, Geochemical Studies, Reprocessing & 3D Modeling of Geophysical Data, Conceptual Modeling, & Potential Calculation)	Hitay Dingin Energy	2014
37	Integrated Geoscientific Data Analysis and Interpretationon of Bromo, Tengger, Semeru Preliminary Survey Assignment Area (Remote Sensing Analysis, Geochemical Studies, Reprocessing & 3D Modeling of Geophysical Data, Conceptual Modeling, & Potential Calculation)	Hitay Renewable Energy	2014
38	Quality Control of MT, TDEM, and Gravity Data Reprocessing of Dieng Geothermal Field	Geo Dipa Energi	2013
39	Quality Control of MT, TDEM, and Gravity Data Reprocessing of Patuha Geothermal Field	Geo Dipa Energi	2013

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No	Project	Partners	Year
40	Re-processing and 3-D Inverse Modeling of MT Data of Mt. Gede-Pangrango Preliminary Survey Assignment Area	Pertamina (Persero)	2013
41	MT-TDEM Survey & 3-D Modeling in North Wayang Windu	Star Energy	2012
42	MT Data Analysis & 3-D Modeling Visualization Services for Rajabasa	Supreme Energy	2012
43	MT Data Analysis & 3-D Modeling Visualization Services for Muara Laboh	Supreme Energy	2012
44	MT Data Analysis & 3-D Modeling Visualization Services for Rantau Dedap	Supreme Energy	2012
45	MT-TDEM Analysis & 3-D Modeling Visualization Services for Muara Laboh	Supreme Energy	2012
46	MT Investigation, Quality Control, Processing, and 3-D Modeling of The Kaldera Danau Banten Geothermal Working Area	Sintesa Banten Geothermal	2011
47	MT Data Acquisition, Processing, and 3-D Modeling of Tampomas Geothermal Working Area	Jabar Energi	2011
48	MT-TDEM Data Evaluation, Reprocessing, and Modeling of Jailolo Geothermal Working Area	Star Energy	2011
B. Geotechnical			
1	Downhole Seismic Logging Survey of Tangerang BMKG Station	FT UI	2014
2	Geoelectrical Imaging for Subsurface Damage Soil Structure Delineation of Surabaya-Gempol Toll Road	Lemtek UI	2014
3	Downhole Seismic Logging Survey of Seabrezee Apartment, Ancol	FT UI	2014
4	Georadar Survey for Subsurface Installment Delineation of Indonesia National Museum	PDA	2014
5	Geoelectrical Imaging for Waste Leakage Delineation of Galuga, Bogor	Local Gov. Bogor	2014
6	Downhole Seismic Logging Survey of Pondok Betung BMKG Station	FT UI	2013
7	Geoelectrical Imaging for Landslide Layer Delineation of Powerline Tower, Sumedang	PLN	2013
8	TDEM Survey for Deep Aquifer Exploration of Cimone, Tangerang	Cimone Mall	2013
9	Georadar Survey for Building Foundation Delineation of Katedral Church, Jakarta	Katedral Church	2013
10	Georadar Survey for Subsurface Installment Delineation of Ministry of Finance, Jakarta	Limawera Wisesa	2012
11	Geoelectrical Imaging for Waste Leakage Delineation of Citayam, Depok	Local Gov. Depok	2012
12	Geoelectrical Imaging for Waste Leakage Delineation of Cipayung, Depok	Local Gov. Depok	2011
13	Geoelectrical Imaging for Subsurface Cavity Delineation of Gunung Puteri, Bogor	Pulau Intan	2011
14	Georadar Survey for Subsurface Installment Delineation of Faculty of Medical, Universitas Indonesia	Andalan Mitra Wahana	2011
15	Geoelectric Imaging and Georadar Survey for Subsurface River Cavity Delineation of A & B Bank Indonesia Building, Jakarta	Bank of Indonesia	2011
C. Training			
1	In-house Training on Feasibility Study of Geothermal Power Development	PLN Pusenlis	2016
2	In-house Training on Geothermal System & Exploration Technology	Antam Geomin	2014
3	Professional Training Course on Geothermal System & Exploration Technology	Professionals	2014
4	Professional Training Course on MT-TDEM and MEQ Technology and Its Application for Geothermal Exploration	Geo Dipa Energi	2012
5	Professional Training Course on MT-TDEM Technology and Its Application for Geothermal Exploration	Supreme Energy	2012

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INSPIRING

INTEGRITY

PARTNERSHIP