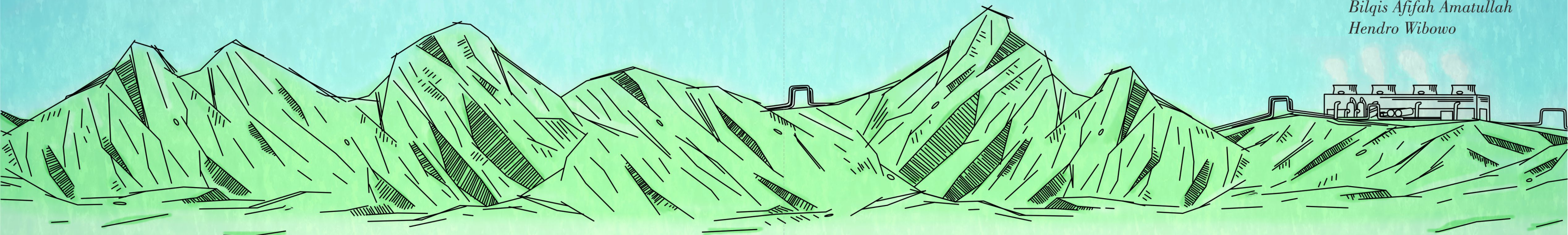


*“Broadening Participation and Initiatives  
Across the Geothermal Education and Research Enterprises in Indonesia”*

## *Proceeding Book*

*Editors:  
Suryantini  
Angga Bakti Pratama  
Bilqis Afifah Amatullah  
Hendro Wibowo*







**PERTAMINA**

GEOHERMAL ENERGY



**1 Campus Center Timur - Auditorium & Gallery**

*Pre-Workshop Course (GRC)*

*Pre-Workshop Course (ITB)*

*Workshop (Plenary & Technical Sessions)*

**2 Lab. Tek. IV - Teknik Geologi, Hilmi Room 7101**

*Mid-Workshop Course (Chevron)*

**3 Basketball & Volleyball Court**

*Exhibition*



**Parking Lot**



**Campus Gate**

The 2<sup>nd</sup> ITB Geothermal Workshop, which took place between 4<sup>th</sup> and 8<sup>th</sup> March 2013 in Bandung, has managed to carry a positive message towards the worldwide geothermal industry, as was expected in this year's workshop theme:

*"Broadening Participation and Initiative across the Geothermal Education and Research Enterprises in Indonesia"*





Roughly 400 participants, delegates, speakers and exhibitors from various countries joined in the series of the workshop programs, started with two pre-workshop courses, continued to the plenary, technical sessions & Chevron parallel course, and finally followed by Wayang Windu Field Trip and the Field Camp Program that shortly explored the vicinity of Tangkuban Parahu Geothermal Area.

Having ended on a high note, the workshop turned out to be a truly memorable experience for most of the participants and has given the opportunity to meet different people across the nation & the globe with various background & expertise. All gathered together in such a warming, unique, and joyous event right in the centre of the industrious ITB campus.







Intense and lively discussions, exchange of ideas also forward thinking regarding to the geothermal development were found throughout the workshop. Furthermore, presentations given by global and national figureheads has opened further opportunities and measures to revitalize the geothermal energy development in Indonesia.

# Contents

Welcoming Remark .....	8
Pre-course Program Highlights .....	10
GRC Course .....	10
ITB Geothermal for Everyone .....	12
Workshop Highlights .....	13
Plenary Sessions .....	14
Technical Paper Presentation Sessions .....	15
Field Trip .....	20
Field Camp .....	21
Paralel Program Highlights .....	22
Exhibition .....	22
Chevron Course .....	23
Gala Dinner .....	24
Organizing and Technical Comitee .....	25
Paper for Technical Session .....	27



## Welcoming Remark and Report from the Committee

### 2<sup>nd</sup> ITB Geothermal Workshop 6<sup>th</sup>-8<sup>th</sup> March 2012

**“Broadening Participation & Initiatives across the Geothermal Education and Research Enterprises in Indonesia”.**

Observing the activities of geothermal community, after the success of the 1<sup>st</sup> ITB Geothermal Workshop on March 2012, it is noted that there are some improvement on the activities and programs conducted by governments, industries and universities for developing geothermal energy in Indonesia. The 2<sup>nd</sup> ITB Geothermal Workshop is aimed to share information on these activities and programs among universities, industry and governments institutions. It is also to invite more parties to join the geothermal community and to promote this green renewable energy to the public. This is why at the 2<sup>nd</sup> ITB Geothermal Workshop we took the theme **“Broadening Participation & Initiatives Across the Geothermal Education and Research Enterprises in Indonesia”**. **Through this event it is expected that in some way, we may know what other party doing, what are they planned and their expectation** in the future, so that we all can stand in our way and in our capacity to took part in accelerating geothermal development in Indonesia. This year workshop is also celebration of the 5<sup>th</sup> anniversary of Master Degree Study Program of Geothermal Technology ITB

For Institut Teknologi Bandung (ITB), with its Master Degree Study Program of Geothermal Technology (Prodi Teknik Panas Bumi) it is the moment to report some of the result of our ongoing collaboration either with Industries such as Star Energy, Pertamina Geothermal Energy, Chevron, Supreme Energy and other industry, or collaboration among universities that has been supported by USAID and Star Energy Collaboration, or internal ITB research and education that has been improved until this year.

ITB’s partner from the government such as Geological Agency, Center for Geological Education and Training, Directorate General of New and Renewable Energy and Energy Conservation, or from Universities such as University of Manado, Padjajaran University, Universitas Pendidikan Nasional, University of Diponegoro, University of Syah Kuala, University of Trisakti, Institute Technology Surabaya, University of Indonesia, University of Lampung, University of Jenderal Sudirman, and other universities, and from Industry as it is mentioned before, and from international Institution such as Netherlands consortium, Kyushu University and GFZ Potsdam-Germany have carried out significant numbers of activities which is in-line with this year workshop theme.

There are some facts and statistics about this workshop, and acknowledgement goes as well to some important people and sponsor that make this workshop take place.

1. The Committee of the workshop that have done excellence works and effort.
2. The sponsor to this workshop that contribute significant finance to realize the idea of Broadening Participation & Initiatives across the Geothermal Education and Research Enterprises in Indonesia.
3. We thank also to Media Partner for promoting this workshop

This workshop is attended by about 250 peoples from six countries (**Indonesia, USA, Netherlands, Japan, Philippine, Germany**). The committee had received about 50 Abstract and 48 full papers from various topics. Out of 48 full papers, 42 will be presented in parallel technical session which is hold today and tomorrow. There is additional 6 papers presented as poster.

There were pre-workshop course conducted by Geothermal Resource Council and attended by 130 participants, other course by ITB which is attended by 20 participants from industries and academic institutions. The exhibition is attended by 8 exhibitors from industries, government institutions and academic participants. ITB Geothermal Workshop Committee together with Chevron is also conducting mid-workshop course attended by 30 participant.

At the end of this workshop a trip to Wayang Windu has been arranged and 10 participants are going for this trip. And at the same time there will be Field Camp in Tangkuban Perahu and its surrounding area with 8 participant.

We are also glad to announce that there are some new comers from universities supported by USAID-Star Energy Collaboration. This is one of many success of our efforts in promoting geothermal energy.

Suryantini  
Chairman



# Pre-workshop Courses

## GRC Course

The Geothermal Resources Council (GRC) Pre-Workshop Course was the curtain raiser for the 2<sup>nd</sup> Institut Teknologi Bandung (ITB) Geothermal Workshop. Surprisingly, it was noticed that GRC delegation's long and exhausting trip to Indonesia was their first travel to foreign soil to host a particular workshop, since almost ten years after their last trip to Mexico in 2003. Steve Ponder, the association's interim Executive Director of GRC, led the team of a very renowned group with over 173 years of geothermal work experience.



GRC Delegates (from left to right): Steve Ponder, Paul Brophy, Paul von Hirtz, Louis Capuano Jr, and Anthony Menzies

A number of 30-50 attendees were expected at first, but an official final count of 150 attendees was present in the ITB east campus center gallery hall and completely exceeded everyone's initial expectations. The number was in fact about half of all attendees at the main workshop meeting, in which came from the attending students nationwide, corporate representatives (Chevron, Star Energy, Supreme Energy, OTP Geothermal) and government institutions (Badan Geologi, ESDM and PSDG) and many others.

The course "Exploration Drilling and Early Stage Geothermal Reservoir Characterization" was presented by Tony Menzies of Chevron, Paul von Hirtz of Thermochem, Paul Brophy of EGS, and Louis Capuano, Jr. of Capuano Engineering. Prior to the workshop day, Anthony Menzies replaced Subir Sanyal from GeothermEx due to unexpected and unavoidable business, meanwhile, Joe La Fleur was a special guest speaker brought by GRC team to present a topic about geophysical data.

Lively discussions were found throughout the course between the GRC delegates and course participants, sharing their respective experiences and exchanging fresh ideas. For the future course programs, GRC suggested longer workshop duration to allow more detailed presentations and a chance to cater to students need and abilities. In addition, they also recommended student exchanges and scholarships to be seriously considered. Moreover, the attending GRC team looked forward for a special session at the GRC Annual Meeting dedicated to geothermal development of Indonesia.



GRC Pre-Workshop Course Presenters: (standing from left to right) Ali Ashat, Steve Ponder, Paul Brophy Paul von Hirtz and Tony Menzies (Sitting from Left to Right) Nenny Miryani Saptadji, Louis Capuano Jr and Suryantini

Monday, March 4th	Day 1
08:30am – 08:45am	Registration
08:45am – 09:00am	Opening Remarks from Sri Widiyantoro (dean of faculty of mining and petroleum engineering), Steve Ponder (Executive Director, Geothermal Resources Council) and Nenny Miryani Saptadji (Head of ITB Geothermal Master Degree Program).
09:00am – 10:30am	Presentation of Exploration Model: temperature gradient holes, core holes, soil sampling, well targeting and data collection by Paul Brophy (President EGS, Inc).
10:30am – 10:45am	Break
10:45am – 12:00pm	Presentation of Geothermal Drilling by Louis Capuano, Jr. (CEO, Capuano Engineering)
12:00pm – 01:00pm	Lunch
01:00pm – 02:30pm	Presentation of Well Testing: hardware design, instrumentation, measurement techniques, logistics and safety by Paul von Hirtz, President Thermochem, Inc.
02:30pm – 02:45pm	Break
02:45pm – 04:00pm	Well Testing: geochemical surface and downhole sampling, data required for plant design, corrosion and scale testing by Paul von Hirtz (2 <sup>nd</sup> Session).
04:00pm – 04:30pm	Day One Overview
Tuesday, March 5th	Day 2
09:00am – 10:30am	Presentation by Tony Menzies about Early stage well testing, long term well testing, step-rate and pressure build up tests, injection and interference tests
10:30am – 10:45am	Break
10:45am – 12:00pm	Presentation of Well design and testing for reservoir engineering data collection by Anthony Menzies (2 <sup>nd</sup> Session)
12:00pm – 01:00pm	Lunch
01:00pm – 02:45pm	Integrated subsurface data for reservoir modelling: A case study for a geothermal field in Indonesia by Suryantini and Ali Ashat (ITB)
02:45pm – 03:00pm	Break
03:00pm – 04:00pm	Presentation of geophysical data for geothermal survey and targeting area by Joe LaFleur
04:00pm – 04:30pm	Workshop wrap up and questions and answers
04:30pm	Closing



# ITB Geothermal for Everyone

The Geothermal for Everyone (GFE) Pre-workshop Course was arranged over again this year to continue to spread awareness about geothermal systems and technology towards public. This year's GFE course was held on the fifth of March, the very day before the main workshop event was held, and located in the same building to where the GRC course was organized: East Campus Center ITB. There were 20 seats available for the course, which was quickly sold out after the registration was open.

Eventually, extra five seats was provided by the committee during the course day, meanwhile several new registration requests was had to be turned down unfortunately regarding to the course room overloaded capacity. In fact, the crowded course room somehow encouraged far more intense discussions, in which made the participants get to know each other and share their experience even faster.

Tuesday, March 5th	
08:00am – 10:00am	Geothermal System (Dr. Eng. Suryantini, ITB)
10:00am – 10:15am	Coffee/ Tea break
10:15am – 12:00pm	Geothermal Exploration (Dr. Eng. Suryantini, ITB)
12:00pm – 01:00pm	Lunch
01:00pm – 03:00pm	Geothermal Production and Utilization (Dr. Nenny Saptadji, ITB)
03:00pm – 03:15pm	Coffee/ Tea break
03:15pm – 04:15pm	Environmental Aspects (Ir. Ali Ashat, ITB)
04:15pm – 05:15pm	Geothermal Economics (Ir. Ali Ashat, ITB)



Nenny Miryani Saptadji (left-most), Ali Ashat (second to left), Suryantini, Several Participants having discussion during the coffee break (right-most)

# Main Workshop Programs

## Plenary Session

The plenary session of the workshop provided participants with interesting perspectives addressed in this year's workshop's theme: **Broadening Participation and Initiatives across the Geothermal Education and Research Enterprises in Indonesia**. The presentations covered areas that included the capacity building in achieving such geothermal excellence in Indonesia, as well as constraints faced and measures required. Moreover, institutional collaboration improvement, scholarship programs and future opportunities were also shared by the plenary speakers.

In general, the plenary discussions was divided into two congested presentation sessions, first from the collaborative partners of ITB, international institutions, Government representatives and then continued with presentations from the major geothermal power developers in Indonesia. Accordingly, the regarding collaboration partners of ITB i.e. Pertamina Geothermal Energy, Star Energy, Kyushu University, ITC, Auckland University, GFZ, GRC, USAID and the West Java Provincial Government, brought up fresh perspectives and updates of their programs towards the global geothermal development and the opportunities that they share in Indonesia.



Workshop participants focusing on the plenary presentations



Wednesday, March 6 <sup>th</sup>	
09:00am – 9:25am	Welcoming Remarks (Suryantini-Committee Chairman, Nenny M. Saptadji-Head of Geothermal Master Degree Program, Abadi Poernomo- Chairman of the Indonesian Geothermal Association)
09:25am – 09:40am	USAID and Beasiswa Unggulan Diknas (BU) Scholarship Awarding Ceremony
09:40am – 09:55am	Keynotes from Vice Rector of ITB
09:55am – 10:10am	Angklung Performance
10:10am – 10:45am	Short Visit of delegates and participants to Exhibition
10:45am – 12:25am	Plenary Session Session-1 (moderated by Nenny Miryani Saptadji)
Presentation-1	Planning of Capacity Building from USAID overview (Retno Setianingsih, USAID Representative for Indonesia)
Presentation-2	ASEAN-Japan Build-up Cooperative Education Program for Global Human Resource Development in Earth Resources Engineering (Prof. Ryuichi Itoi – Earth Resources Engineering Department of Kyushu University)
Presentation-3	Planning of Geothermal Capacity Building Approved by Netherland Government
Presentation-4	Geothermal (Prof. Freek van der Meer, chairman of Earth System Analysis Department of The University of Twente)
Presentation-5	Center of Excellence Initiated in West Java (Tubagus Nugraha, Head of Upstream Management of the West Java Provincial Government)
Presentation-6	Current joint activities and perspective contributions to a Center of Excellence in West Java (Dr. Kemal Erbas, Senior Researcher in Helmholtz Centre Postdam GFZ German Research Centre for Geosciences)
12:25am – 01:25pm	Break
01:25pm – 02:45pm	Plenary Session Session-2 (Moderated by Benyamin Sapiie)
Presentation-1	Geothermal Capacity Building - a Developer's Perspective (Alex Smilie, Vice President Geothermal Operations of Star Energy)
Presentation-2	Geothermal Prospects in Indonesia – PGE at a glance (Imam B. Rahardjo, Senior Manager Geophysicist)
Presentation-3	The International Aspects of the GRC Organization and Possible Ways to Expand Relationship with the Indonesian Geothermal Association and Its Members (Steve Ponder, Executive Director of Geothermal Resources Council (GRC))
Presentation-4	Socialization of NZ-ASEAN Scholarship (Martanova Hartoyo, Managing Contractor for New Zealand ASEAN Scholars)

# Technical Paper & Poster Sessions

The Technical Session began soon after the plenary session was over, which started with four special selected topics and continued with a full-day session in the following day (6-7 March 2013). The programs in this session included oral and poster presentation located in the Auditorium (Room 1-exploration) and Gallery Hall (Room 2 - engineering & multi-disciplinary) of the East Campus Center building. There were 49 papers submitted, divided into three fields: exploration, engineering, and multi-discipline topics. Accordingly, 36 papers were presented in oral presentation sessions, while 10 papers were prepared for reserves and the other three papers were presented in poster sessions.

The lively discussions during the plenary were maintained throughout the following technical presentations. Though, as the last year's event, exploration topics still took the main attention from the participants. Closing the second day, the committee awarded Donny R. Wenas from UNIMA as the favorite presenter, having been chosen by the rest of the participants with an unanimous count result. After the award announcement, the workshop was officially wrapped up by a speech from Mrs. Nenny M. Saptadji (Head of ITB Geothermal Master Degree Program).



Workshop participants paying deep attention to the special topics on the first day technical session

Date	Paper Code	Paper	Author	Page
<b>Wednesday, March 6, 2013</b>	<b>Multi-Discipline</b>			
	<b>101</b>	Feed-in Tariff for Indonesia's Geothermal Development	Dr Ir Madjedi Hasan, MPE, MH and Ir. Anton Wahjosoedibjo (PEN Consulting)	29
	<b>102</b>	Design for Community Approach in Geothermal Development Sites : Notes From a Case of Community Resistance	Dewi Yuliani (ITB)	35
	<b>103</b>	Environmental Baseline Imaging For Geothermal	Widya Utama (ITS)	43
	<b>104</b>	A Single Absorption Refrigeration System Implementation for Cooling Purposes – a Case Study of Potatoes Chilling Injuries Prevention in Dieng Central Java Province – Indonesia	Riostantieka Mayandari Shoedarto (ITB)	51
<b>Thursday, March 7, 2013</b>	<b>Exploration</b>			
	<b>105</b>	Outflow Zone Indication of Geothermal System in Paguyangan Hotspring, Brebes, Central Java	Sachrul Iswahyudi, Asmoro Widagdo, Subana (Universitas Jenderal Soedirman)	57
	<b>106</b>	Hot Spring Power Plant : an Alternative to Develop Low Temperature Geothermal System	Dikdik Risdianto and Andri Eko Ari Wibowo (PSDG)	63
	<b>107</b>	Geothermal Heat Flow Measurement for Predicting Subsurface Temperature Distribution	Bagus Endar B. Nurhandoko, Susilowati, Agus Deny, Mahatman Lisyobud, Insan Rizal (ITB)	69
	<b>108</b>	Current Temperature Studies in Kamojang Geothermal Field West Java Indonesia	Emmy Suparka, D.F.Yudiantoro, Suyatno Yuwono, Isao Takashima, Johannes Hutabarat, and M.Yustin Kamah (ITB, UPN, AKITA UNIVERSITY, UNPAD, PGE)	73
	<b>109</b>	Wireless Microseismic Monitoring System Design	Risky Martin Antosia, Tedy Setiawan, R. Rachmat Sule (ITB)	81
	<b>110</b>	Application of Ensemble Empirical Mode Decomposition (EEMD) for Identification of Hydrothermal Dynamics in the Subsurface, Case Study Mt. Lamongan, East Java	Widya Utama, Tri Martha , Dwa Desa (ITS)	87
	<b>111</b>	Spectral Reflectance of Geothermal Area Surface as Function of Electromagnetic Wavelength with Landsat Thematic Mapper	Donny R. Wenas, Cyrke A.N. Bujung (Universitas Negeri Manado)	93
	<b>112</b>	Shallow to Moderate Depth Resistivity Structure of a Geothermal Field from Inversion of Geo-Electrical Sounding Data	Hendra Grandis, Diky Irawan, and Prihadi Sumintadiredja (ITB)	97
	<b>113</b>	Estimating Geothermal Potentials Using Fuzzy-Geostatistics of Multi- Sensor Remote Sensing Data	Asep Saepuloh, Minoru Urai, Suryantini, and Prihadi Sumintadireja (AIST)	105
	<b>114</b>	Hydrothermal Flow Modeling at Western Flank of Slamet Volcano, Central Java, Indonesia, Based on Magnetotelluric Data	Wahyu Srigutomo, Siti R. Auliyani, Prihandhanu M. Pratomo, Anggie Susilawati, Mamay Sumaryadi (ITB)	113



Date	Paper Code	Paper	Author	Page
Thursday, March 7, 2013	<b>Exploration</b>			
	115	2D Analysis of Magnetotelurik Data at Cubadak Geothermal Area	Muhammad Kholid, Harapan Marpaung, Achsanur Rifqie (UGM)	Not available
	116	Stripping Filter Implementation for Interpretation Time-Lapse Microgravity Data Kamojang Geothermal Field 2006-2007	Ahmad Zaenudin (UNILA)	119
	117	Geothermometer at Ciselok Geothermal Field, Sukabumi, West Java	Intan Paramita Haty (UPN)	123
	118	Bicarbonate as an edge of Ungaran geothermal system at ulo river, Pringapus, Semarang Regency	Edwin Pranata Siahaan (Universitas Diponegoro)	129
	119	Geochemical Characteristic of Thermal Spring in Non Volcanic Geothermal System and Its Implication to Exploration Concept; Case Study: Bora and Pulu Area	Prameswarie Tari Nursethyawati, Suryantini, Niniek Rina Herdianita (ITB)	137
	120	Fluid Geochemistry Characteristics of Cipari and Wanareja Hot Springs, Cilacap, Central Java	Aribowo Y. and Nugroho A. (UNDIP)	143
	123	The Liquid-dominated System Conceptual Model of Geothermal Exploration in Indonesia	Iwan Nurfahrudin (ITB)	Not available
	124	The Potency of Geothermal Resources in Kalimantan	Andri Eko Ari Wibowo and Mochamad Nurhadi (PSDG)	147
	125	Simulation of Gaps Propagation in Rock Layers Due to Tectonic Stress and Fluid Flow in Geothermal Reservoirs	Rico DP Siahaan, Muhammad Aufaristama, Aditya Lesmana, Rijal Ziya, and Adnan Nullah Hakim (UNPAD)	Not available
	126	Volcanostratigraphy Study of Pangalengan Topography Map in Scale 1:100000 and 1:50000 to Predict the Possible Geothermal Prospect Area	Deny Dwi Nurwati, Dicky Ahmad Zacky, Nevi Nurviani Vilanti, Alfredo Sugiarto, Rocky Martakusumah, Eka Adhitya Kurniawan (ITB)	153
	127	Geothermal Potential of Mount Malabar Based on Vulcanostratigraphy Study	Ghilman Azka, Alessandro P., Bilqis A. Amatullah, Sitti N. Asnin, Riky Regandara, Dudi Hermawan, Agung Prihadi S (ITB)	161
	213	A Survey of Geothermal Potential at Sembalun Area, Eastern Lombok District, West Nusa Tenggara	Hidartan (Trisakti)	167
	214	Tectonic Control on Hydrothermal System Associated and Related to Both The Geothermal and The Precious Ore Forming Systems	Karyono (Trisakti)	177
	215	Determination of Some Hazardous Gases from Geothermal System by Gas Chromatography	Muhammad Bahi, Rinaldi Idroes (UNSYIAH)	186
	216	Updating of the Geothermal Research on Candi Umbul Hot Springs, Magelang Central Java, Indonesia	Udi Harmoko (UNDIP)	190

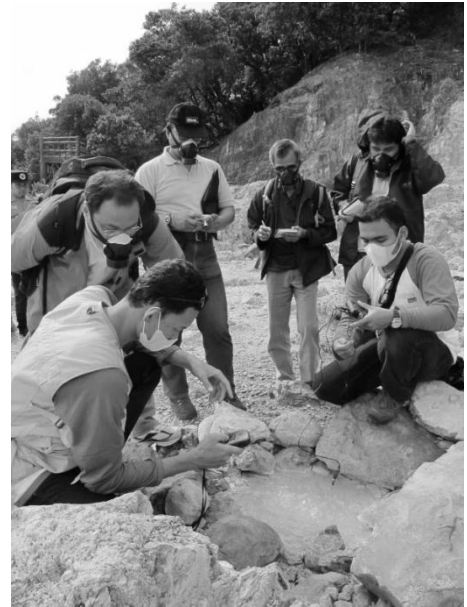
Date	Paper Code	Paper	Author	Page
Thursday, March 7, 2013	<b>Exploration</b>			
	221	Twenty Years Chemical Characteristics of Hot Springs in Sileri Hydrothermal System - Dieng Geothermal Field	Riostantieka Mayandari Shoedarto, Winahyu Setyo Utami, Niniek Rina Herdianita (ITB)	Not available
	222	Fluid Geochemistry Characteristics of Tempuran and Kaliputih Hot Springs, Wanayasa Central Java	Aribowo Y and Setyawan A (UNDIP)	194
Thursday, March 7, 2013	<b>Engineering</b>			
	201	Numerical Simulation of Transient Two-Phase Flow in Geothermal Production Well with Multi-Feed Zones	Y. Katayama, R. Itoi, T. Tanaka (Kyushu University)	199
	202	Well Characteristic in Great Sumatera Fault (GSF) New Finding	Muhammad Tamrin Humaedi, Rudy Martikno, Jantiur Situmorang, Julfi Hadi, Novianto, Merry Christiana Wisnandary (Supreme)	207
	203	Reservoir Modelling of Ngatamariki Geothermal Field	Muchsin and Prof. Michael J. O'Sullivan	213
	204	Evaluation of Shape Factor for Naturally Fractured Geothermal Reservoir Modelling	Adrianto and Zuher Syihab (ITB)	223
	205	Calculation and Analysis of Pressure Drop on Pipelines Transmission Steam Geothermal Power Plant in Indonesia	Dede Irama (ITB)	235
	206	Free Governor Mode of Operation: A Challenge for Geothermal Power Station with Liquid Dominated	Munggang H. Purnanto (STAR ENERGY)	241
	207	Modification of Compressible Flow Equation for single Phase Steam Geothermal Well	Rudi Hendrarsakti J, Zuher Syihab, and Ali Ashat (ITB)	Not available
	208	Drag Coefficient for PTS Tool Based on Literature, Field data, and Flow Modeling	Harry Nurulfuad, Jooned Hendrarsakti, and Zuher Syihab (ITB)	247
	209	Interpretation of Well Test Analysis Into Reservoir Simulation for A Dual Porosity Model	Lia Putriyana and Zuher Syihab (ITB)	253
	210	Bit Performance Evaluation: A Case Study in "X" Geothermal Field in Indonesia	Bonar Tua Halomoan Marbun, Novianti Ekasari and Muhammad Asri (ITB)	257
	211	The Drilling Well Targeting TG's and SH's Geothermal Exploration Survey, Tangkuban Parahu West, Java - Indonesia	Sugeng Triyono (PT. INDONESIA POWER)	265
	212	Reservoir Simulation Optimization using Kalman Filter	As'adul Murtadlo (ITB)	Not available

Date	Paper Code	Paper	Author
	<b>Reserved Paper</b>		
	<b>Reserved Paper</b>	Century of 21st : Geothermal is One of the Alternative Enhance Energy in the World	Angga Pidoartwanta (UNDIP)
	<b>Reserved Paper</b>	Manifestasi Geothermal Di Sekitar Kaki Gunung Meuh Kabupaten Aceh Besar sebagai dampak dari Struktur Geologi Sesar Seulumum	Gartika Setiya Nugraha (UNSYIAH)
	<b>Reserved Paper</b>	Types of geothermal systems in Indonesia	Johanes Hutabarat (UNPAD)
	<b>Poster Presentation</b>		
	<b>Poster Presentation</b>	Remote Sensing Application on Geothermal Exploration	Eddy Z. Gaffar (LIPI)
	<b>Poster Presentation</b>	Surface Fracture Analysis in the High Fault and Fracture Density (FFD) Zones in the Recharge Area of Wayang Windu Geothermal Field, West Java	Fajar Hendrasto, Lambok M. Hutasoit, Benyamin Sapiie dan M. Syahril Badri Kusuma (ITB and TRISAKTI)
	<b>Poster Presentation</b>	Origin of Springs and Hotsprings at Mountain Ridge of Bandung Basin	Cipto Purnandi Septianto (ITB)



# Field Camp

The main workshop program was followed by a two day field camp program to explore the vicinity of Tangkuban Perahu Geothermal Area. Having completed the plenary and technical sessions, a total number of seven participants straightly headed to the geothermal camp in Lembang (25 km from Bandung) to take lectures given by Dr. Suryantini about pre-field work preparations, data processing and how a conceptual model of a geothermal system should be created. On the following day, the participants had a few stops to Ratu Crater, Domas Crater Area, Maribaya and Ciater, consecutively, to exercise basic field data collecting techniques of geothermal exploration i.e. determining manifestation location, measuring the temperature and pH of the manifestations. Moreover, the participants was trained to project the collected location data into a particular map and to analyse the obtained manifestation data, in order to have a slight description regarding to the geothermal potential in the respective observed areas.



The instructors session showing field measurement techniques to participants



This year's field trip was a one full day visit to Wayang Windu Geothermal Field of Star Energy, after last year's splendid visit to Kamojang. Eighteen local and foreign participants from various institution and industries took part in this trip. Unfortunately, there were several substantial changes towards the initial field trip plans, such as the visit to Malabar Tea Plantation that was cancelled due to weather conditions and the Power House that could only be viewed from distance due to safety reasons regarding to the operational works that took place at that time. However, the participants still had an exciting trip, since they were able to visit several well pads and manifestations located within the Wayang Windu Geothermal Field.

Having been gathered early in the morning, the field trip participants arrived to Wayang Windu at 9 am and was soon welcomed by Mr. Achmad Nauval, as the representative of Star Energy Geothermal Wayang Windu Ltd management. After having a short presentation about the Wayang Windu's Field overview, the participants was guided by Mr. Deni (Star Energy Engineer) and several committee instructors to have a close look to well testing activities and several well pads in the area (WWD and WWT well pad). The participants then continued their trip to Wayang crater and Cibolang Park. In both of the sites, participants, Mr. Arif Susanto (Geology Lecture-ITB) gave comprehensive details to the participants regarding to the geology, manifestation and rock alterations of the respective sites and their contribution towards the overall geothermal system of Wayang Windu.

# Field Trip



Mr. Arif explaining the geology overview of Wayang Windu (upper). Field trip participants and Star Energy representatives before returning to Bandung (lower).



## Exhibition

Having to be held outdoor this year to improve the exposure to public, the exhibition event still took large attention both from the booth participants and the visitors since the exhibition event was officially opened. The exhibition booth participants came from geothermal companies, research institution and government agencies i.e. Dirjen EBTKE, Chevron, Badan Geologi, Pusdiklat Geologi, WWF, Lab.Teknik Geofisika ITB, Universitas Indonesia and PT. Pertamina Geothermal Energy. Having been opened from 9am to 4pm parallel to the main workshop's event, the exhibition booths were always filled by curious and enthusiastic students from across the campus, public visitors around Bandung and also attracted the Workshop Participants to stay for a while.





# Chevron Mid-Course

Chevron hosted a parallel course during the main technical session event. The regarding Chevron mid-course attracted most of the workshop participants, but unfortunately only 32 participants were finally accepted to attend the course, from a number of 20 course participants expected at first. The instructors team was led by Riza Pasikki (Chevron's Advisor Reservoir Engineer), accompanied by three other reservoir engineers: Frederick Libert, Alfianto Putra and Ari Aditya, which all have been heavily involved in various geothermal well stimulation activities such as massive water injection, thermally-induced, slow-acidizing, and coiled-tubing acidizing. Furthermore, the course included a case study based on real data of a sub-commercial geothermal well. The case study was intended to make participants to exercise in designing of the required stimulation and to calculate the economics of proposed design.



Chevron Instructors giving explanation to the course participants.

# Gala Dinner

A special Gala Dinner was arranged to celebrate the 5th year of ITB Geothermal Master Degree Program. Around 40 guests attended the gala dinner, including the guests from GRC, The Faculty of Geo-Information Science and Earth Observation (ITC) of the University of Twente, GFZ, Bappenas and API. The achievements, programs and experiences throughout the years was shared to the guests by the regarding lecturers. Moreover, through this ceremonial event, Dr. Nenny Miryani Saptadji (Head of ITB Geothermal Master Degree Program), Mr. Abadi Poernomo (Chairman of API) and Mr. Sukhyar (Head of Geology Agency) was awarded with the first ever ITB Geothermal Leadership and Legacy Medal, regarding to their leadership, dedication and excellence in geothermal science and technology that came along with their remarkable service and contribution for Indonesia's Geothermal Development.



# ORGANIZING AND TECHNICAL COMITEE

<b>Chairman</b>	: Suryantini
<b>Program Coordinator</b>	: Supremlehaq Taqwim, Alessandro Putera, Fuad Satrio Adjie
<b>Secretary General and</b>	
<b>Registration Team</b>	: Dimas Taha, Vega Amazona Muchlis, Rendy Delliansyah, Siti Nur Asnin, Famelia Nurlaela
<b>Treasury</b>	: Wita Rosmala S, Riswan Herdian
<b>Sponsorship</b>	: Dicky Ahmad Zaky, Rocky Martakusumah
<b>Public Relation and</b>	
<b>Publication</b>	: Eka Aditya K, Nevi Nurviani V Ilham A. Pane, Dudi Hermawan, Akbari
<b>Pre-Workshop Course</b>	: Lutfi Abdul Qohar, Arga M. Q, Muhammad Asri, Anggie Rengganis
<b>Plenary Session</b>	: Ricky Regandara, Novianti E, Akbari
<b>Technical Session</b>	: Angga Bakti P, Bilqis Afifah A, Agung WS (alm), Tria Selvi Rustina,
<b>Exhibition</b>	: Mahesa Pradana S, Fadli Faturrahman R
<b>Field Trip</b>	: As'adul Murtadlo, Ali Fahrurrozie, Muhammad Imaduddin
<b>Geothermal Field Camp</b>	: Ridho Fakod
<b>Documentation</b>	: Yosi Amelia, Prihatmaka
<b>Logistics</b>	: Ghilman Azka, Dede Irama, Lantip Candraditya
<b>Design Incubator</b>	: Arif Rifiyanto, Billy Sarbine P
<b>Consumption</b>	: Deny Dwi Nurwati
<b>General Affairs</b>	: Andy H. Koes, Agung Prihadi S, Winahyu Setyo Utami, Riostantieka Mayandari S, Ariya Dwinanto, Dewi Permatasari, Aryo Rahardianto