



Geothermal: The Energy to Change the World

WGC2010

Daily News



Official Newspapers of
the World Geothermal Congress
25-30 April 2010

Issue 1/ April 25, 2010

Bali International Convention Centre, Nusa Dua, Bali-Indonesia



**LADISLAUS
"LADSI"
RYBACH,**
IGA President

THE WGC2010 Theme "Geothermal: Energy to Change the World" signals the need for changes – especially to counteract global warming – as well as the favorable characteristics of geothermal technology, providing sustainable, indigenous, environmentally friendly energy supply worldwide, independent of daily or seasonal variations. Geothermal energy development needs a boost of increasing annual growth, not to fall behind wind and solar photovoltaic growth that clearly exhibits exponential increase in installed capacity.

Now being at the Congress take all advantages: meet many friends and colleagues, present and learn about results of scientific research and technology development, strengthen existing and develop new personal contacts, establish business opportunities in a more and more global market place, see the available products and services at the Exhibition, take part in the Field Trips. Besides, participate in the various cultural, social and sightseeing events of the Congress Program. And last but not least: enjoy the magnificent setting of Bali!

Here I take the opportunity to thank Congress Sponsor and Co-Convenor INAGA (Indonesian Geothermal Association, Dr. Surya Darma, President), the Organizing Committee (Dr. Herman Darnel Ibrahim, President, IGA's Steering Committee (Dr. Gordon Bloomquist, President), and all the numerous helpers, Sponsors, etc. who worked hard to organize a great event.

I wish you an unforgettable time at WGC2010!

— LADISLAUS "LADSI" RYBACH,
IGA President



Ulu Danu
Temple near
Bedugul,
Singaraja,
North of Bali

WGC2010

From Bali to Changing the World



WELCOME

to Bali. After Antalya, Turkey, five years ago, 2010 the best

tourist destination in the world, the island of the Gods, will proudly witness the greatest convention of geothermal stake holders to create a better world. The fourth World Geothermal Congress (WGC) has the geothermal theme of Geothermal: The Energy to Change the World, and is hosted by Indo-

nesian Geothermal association (INAGA) and the Ministry of Energy & Mineral Resources RI.

"The theme of 'Geothermal: The Energy to Change the World' is deliberately chosen since the geothermal power is proven to be environmental friendly and provide benefits not only for Indonesia, but also for the rest of the world," said Dr. Ir. Surya Darma, MBA, the President of INAGA. In addition the success of WGC2010 will eventually promote the image

of Indonesia in the eye of the world. "Geothermal can be a reliable alternative energy source that could change the world, which is now facing the global warming problems. This conference will encourage more people in the world to use geothermal as an environmentally-friendly and renewable energy source."

Then what is the significance of the conference that is in Indonesia? "Indonesia owns 40% of the world's geothermal

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BALI AND BEYOND

Nusa Dua, one of the world's best tourist spots

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THE WORLD BANK

2 WELCOME



SURYA DARMA

President of the Indonesia Geothermal Association (INAGA)

ON behalf of members of the Indonesia Geothermal Association (INAGA), I warmly welcome all delegates to the World Geothermal Congress (WGC) 2010 in Bali, Indonesia. It is a great honor for INAGA to co-convene this event, and we hope that this congress will steer us further ahead in our quest to solve the global energy crisis.

Indonesia, a country blessed with some 28,000 MW of geothermal energy potential, offers attractive business opportunities worth nearly US\$50 billion, out of which just less than five percent have been tapped. The Indonesian Government has asserted that geothermal development will be given special priority to meet the increasing demand for new and alternative energy sources.

Let's put our heads together during this WGC and find solutions to overcome the complex challenges faced in today's environment. The outcome of our discussions will be in the form of the WGC2010 Bali Declaration which will be in the interest of mitigating global warming and climate change issues.

So, welcome to Bali! I look forward to seeing you and trust you will enjoy your time at the WGC2010. 🌺

WGC2010 DAILY NEWS

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The views expressed in the articles, features and listings are not necessarily those of the WGC2010 Organizing Committee or the editors.

HEADLINE

WGC2010 : From Bali to Changing the World.....

potential, however only 1196MW are already utilized," said Darwin Zahedy Saleh, the Minister of Energy and Mineral Resources. Therefore this forum is useful not only for Indonesia i.e. to attract investors, but the presence of chief executive officers and chief finance officers from all over the world will also take benefits of the development of geothermal power globally.

It is not only Bali who has been ready to welcome the arrival of over 2000 participants from at least 85 countries, the committee of WGC2010 since 2006 has also prepared this momentous event, a year after the closing of the conference in Turkey. As has been said by Dr. Herman Darnel Ibrahim, the chairman of the committee of WGC2010, since 2006 the congress has been carefully prepared. "The congress is a meeting forum among scientists, experts, industrialists, developers, operators, and regulators of geothermal industries, as well as business related to geothermal power. The participants of the congress will share new science, new technology, and new experience in all aspects of geothermal power, beginning from Earth Science, Upstream and Downstream Engineering, Maintaining Operation & Development up to Funding," he explained.

About the theme, he added that this theme is almost a dream, but it's true geothermal can change the world if we can change geothermal itself."

According to him the world is expecting WGC2010 to lead further developments of geothermal power in the world. WGC2010 is also expected to create a declaration (Bali Declaration) on the development of

geothermal power as a renewable and environmental-friendly source of power. "This congress will be a good opportunity for stakeholders to share their practices in developing geothermal, ranging from the upstream industry to the downstream one. They can discuss about exploration, drilling and investment as well."

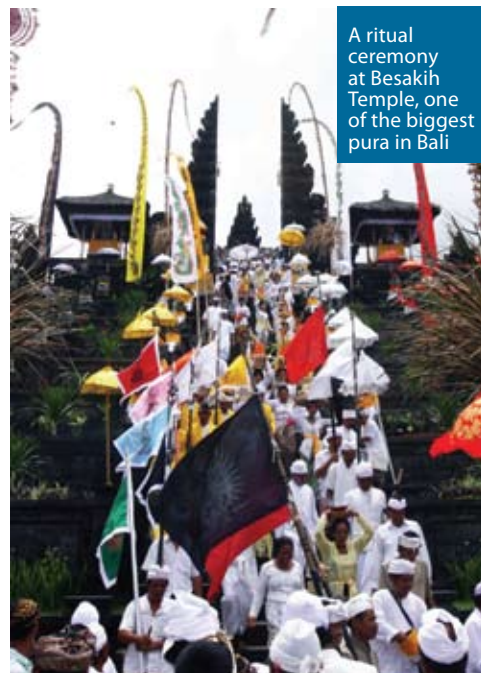
As the host of WGC2010, the Indonesian Geothermal Association (INAGA) is supported by the Ministry of Energy and Mineral Resources, Ministry of Culture and Tourism, Governor of Bali, State Ministry For National Development Planning/The National Development Planning Agency (BAPPENAS), National Energy Council, Ministry of State Owned Enterprises, state Ministry For Research and Technology, and Ministry of Foreign Affairs. The congress is also supported by both local and international private sectors, among others, Chevron and Star Energy as the leading sponsors and Pertamina Geothermal Energy, PT PLN (Persero), Ormat Technologies Inc, Energy Development Corporation (EDC), Medco Energi, Itochu, Halliburton as the supporting sponsors.

More than 1450 papers covering 32 topics has been submitted and selected by reviewing team who select 1032 papers, 98 of which are from Indonesia. From the selected papers, 650 papers will be presented orally in 131 parallel sessions within 5 days. While the other 379 papers will be presented in poster sessions. Furthermore there will be exhibitions followed by 81 booths from 85 companies. In a complete outline, the series of events in World Geothermal Congress 2010 consists of congress, exhibition, field trip, short course, side events and Indonesian Cultural Night which is especially designed.

Some of the speakers who will present in WGC2010 are among others the President of Iceland, Ólafur Ragnar Grímsson; the Indonesian Minister of Energy and Mineral Resources, Dr. Darwin Zahedy Saleh; the president of International Geothermal Association (IGA), Ladislaus Rybach; the president director of Pertamina, Karen Agustian; the president of Chevron Asia Pacific Exploration and Production Company. There will also be panel discussions.

Several side events in WGC2010 have been confirmed i.e. the discussions among the representatives of world's organizations for renewable energy such as International Hydropower Association, International Solar Energy Society, World Wind Energy Association, World Bio-energy Association, and Chairman of International Renewable Energy Alliance.

Let's have nice discussions, interesting science and experiences sharing and hopefully the spirit will bring togetherness toward a better world! 🌺



A ritual ceremony at Besakih Temple, one of the biggest pura in Bali

AGENDA | Sunday, 25 April 2010

08.30am – 01.00pm	Golf Tournament	New Kuta Golf And Country Club - Pecatu
01.20pm – 05.10pm	Re-registration and Onsite Media Registration	Registration Counter, BICC
03.00pm – 04.00pm	Press Briefing	Denpasar Room, BICC
07.00 pm – onward	Welcome Reception	Poolside & Garden, Westin Hotel



WORLDWIDE GEOTHERMAL UTILIZATION 2010

JOHN W. LUND
 Geo-Heat Center, Oregon Institute of Technology, Klamath Falls, Oregon,
 Ruggero Bertani, ENEL, Rome, Italy



Geothermal power has produced electric power in 27 countries. Since 2000 the installed capacity in the world has increased by almost 3,000 MWe.

FROM the 68 country update papers submitted to the World Geothermal Congress 2010 (WGC2010), the following figures on worldwide geothermal electric and direct-use capacity have been obtained. A total of 78 countries have reported some utilization from WGC2000, WGC2005, and WGC2010 electric, direct-use, or both.

Electric power has been produced from geothermal energy in 27 countries; however, Greece, Taiwan and Argentina have shut down their plants due to environmental and economic reasons. Since 2000, additional plants have been installed in Costa Rica, France on Guadeloupe in the Caribbean, Iceland, Indonesia, Kenya, Mexico, and Philippines. In 2004 Germany

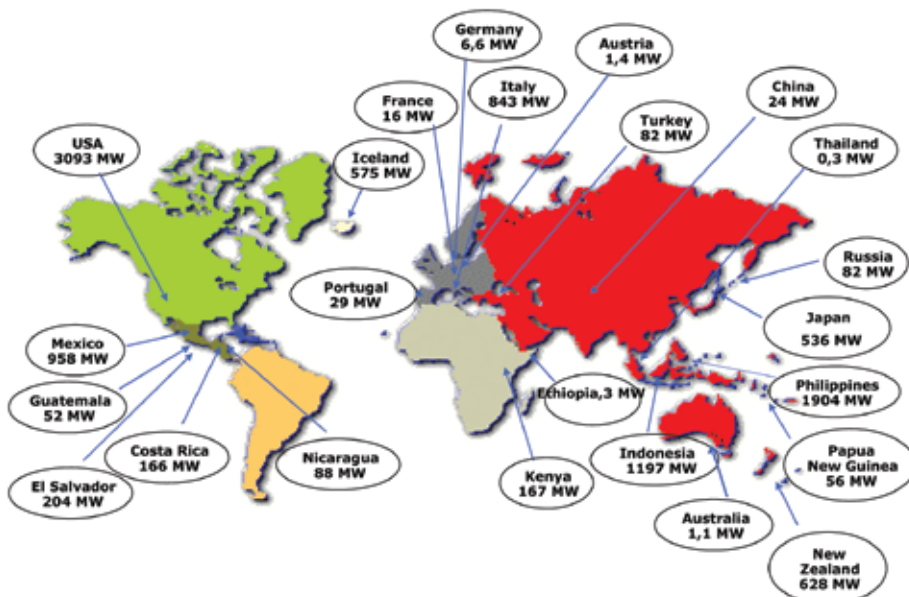
Table 1. Total Geothermal Capacity and Use in 2010

Use	Installed Power MWe	Annual Energy Use GWh/yr	Capacity Factor	Countries Reporting
Electric Power	10,715	67,246	0.72	24
Direct-Use	50,583	121,696	0.27	78

The figures for electric power capacity (MWe) appear to be fairly accurate. The direct-use figures are less reliable and probably are understated by as much as 20%. The submitted data have been summarized as follows:

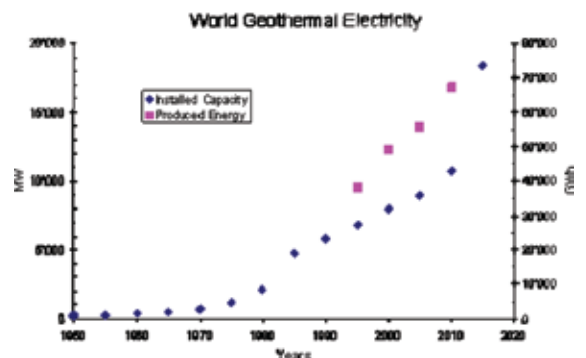
Table 2. Summary of Regional Geothermal Use in 2010

Region	ELECTRIC POWER			DIRECT-USE		
	% MWe	% GWh/yr	# Countries	%Mwt	%GWh/yr	# countries
Africa	1.6	2.1	2	0.1	0.6	7
Americas	42.6	39.9	6	28.9	18.4	15
Asia	34.9	35.1	6	27.5	33.8	16
Europe	14.5	16.2	7	42.5	45.0	37
Oceania	6.4	6.7	3	1.0	2.2	3



installed a 210-kWe binary plant at Neustadt Glewe and 56-MWe plants have been installed on Papua New Guinea to generate electricity for a remote mine. Russia has completed a new 50-MWe plant on Kamchatka. More recently, a 200 kW binary plant using 74°C geothermal water and 4°C cooling was installed at Chena Hot Springs Resort in Alaska (Lund, 2006). The operating capacity in the United States has increased since 1995 due to completion of the two effluent pipelines injecting treated sewage water at The Geysers. In an attempt to bring production back, the Southeast Geysers Effluent Recycling Project is now injecting 340 l/s of treated wastewater through a 48-km long pipeline from Clear Lake, adding 77 MWe. A second, 66-km long pipeline from Santa Rosa was placed on-line in 2004, injecting 480 l/s that are projected to add another 100 MWe to The Geysers' capacity.

One of the more significant aspects of geothermal power development is the size of its



contribution to national and regional capacity and production of countries. The following countries or regions lead in this contribution with more than 5% of the electrical energy supplied by geothermal power, based on preliminary data from WGC2010: Lihir Island (Papua New Guinea), Tibet, San Miguel Island (Azores), Tuscany (Italy), Iceland, El Salvador, Kenya, Philippines, Nicaragua, Guadeloupe (Caribbean), Costa Rica and New Zealand.

DIRECT UTILIZATION

One of the significant changes for WGC2010 was the increase in the number of countries reporting usage. Six countries were added to the list in the current report, up from 2005

figures. There has also been a large increase in geothermal (ground-source) heat pump installations. At present, they are the largest portion of the installed capacity (69.7%) and 49.0% of the annual energy usage.

In terms of the contribution of geothermal direct-use to the national energy budget, two countries stand out: Iceland and Turkey. In Iceland, it provides 89 % of the country's space heating needs, which is important since heating is required almost all year and saves about 100 million US\$ in imported oil. Turkey has increased their installed capacity over the past five years from 1,495 MWt to 2,084 MWt, most for district heating systems.

ENERGY SAVINGS

Using geothermal energy obviously replaces fossil fuel use and prevents the emission of greenhouse gases. If we assume that geothermal energy replaces electricity generation, the conversion efficiency is estimated at 0.35 (35%). If the replacement energy for direct-use is provided by burning the fuel directly, then about half this amount would be saved in heating systems (35% vs. 70% efficiency). The savings in fossil fuel oil is equivalent to about three days (1%) of the world's consumption.

FUTURE DIRECTIONS

Geothermal growth and development of

electricity generation has increased significantly over the past 40 years, ranging from 3-11% annually. Direct-use has remained fairly steady over this period at 10% growth annually. Now, 78 countries report utilizing geothermal energy, an almost eight-fold increase in participation. At least 10 countries are expected to be online by 2015. Developments in the future will include greater emphases on combined heat and power plants. The largest growth will include the installation and use of geothermal heat pumps, as they can be used anywhere in the world. 🌱

INTERVIEW

WGC2010 is a Barometer of Geothermal Science and Technology Development

DR. R. SUKHYAR, *The Head of the Geology Agency, Ministry of Energy and Mineral Resources of the Republic of Indonesia*



INDONESIA is elected by the International Geothermal Association to host the World Geothermal Congress (WGC) 2010. Through this event, Indonesia hopes to show the world its commitment in reducing the emission by utilizing a renewable energy and to gain benefits of geothermal-power science and technology sharing and investment. The following is the excerpt of interviews with the head of the Geology Agency, Ministry of Energy and Mineral Resources of the Republic of Indonesia, Dr. R. Sukhyar, on the hopes of Indonesia in the WGC2010:



we own many tourist objects near areas of active volcanoes where geothermal power is contained. So we cannot separate geotourism from the many geothermal sources and volcanoes in Indonesia. This kind of concept should be extended and introduced to the world.

We need to also make use of this event to learn from the world's experts coming to WGC2010, especially those from developed countries, to enhance geothermal power in Indonesia, since this event can be a barometer for the development of geothermal science and technology.

Considering our government's great concern toward geothermal power, this event can be also used to increase international interests on geothermal investment in Indonesia.

To enhance and process Indonesian geothermal potential, what can be offered for prospective investors through WGC2010 in order to invest in Indonesia?

We use this event to inform projects with available commitments, something attracting attention. The government offers working area for exploration together with its policies.

I think if we do comparison with other countries,

the policies that the government has taken, i.e. using selling price, will attract attentions and interests of businessmen and market participants in the WGC2010 forum. I think Indonesia will remain center of investor's attentions.

We have to fix our infrastructure in the areas of operation that should be observed both by the central and local governments. The next thing is the awareness of local government to provide operational ease in Indonesian regions.

How prospective is Indonesian geothermal potential?

Indonesia has a great geothermal potential. Around 35-40% of the world's geothermal power can be found in Indonesia. Indonesia should have made optimum the geothermal usage for local power; since geothermal power cannot be transported, it should be optimally managed for local use.

If only we can use 9000MW of geothermal power, we can economize on fuel around 4 billion barrels. That is magnificent, not to mention the advantage we get from the reducing of CO2, I am sure million tons of CO2 can be reduced. From the perspective of resources, Indonesia has the greatest deposit of geothermal power; right now it achieves the number of 28.000MW.

What about the domestic geothermal power usage?

We must not see the geothermal power usage only from electrical usage, but also for direct usage. However, direct usage of geothermal power has not been developed, for example to desiccate agricultural products such as tea, corn, rice, copra, and coffee. We should pay more attentions to these in the future. 🌱

What is your comment on the World Geothermal Congress 2010 (WGC2010) in Bali?

We are thankful that we are trusted to host WGC2010. This is particularly a rare event since it is only held once in five-years.

This event is also a result of a long process beginning five years ago when we outdid competitors from other countries, among of which are developed countries with developed geothermal power technology such as Iceland and Germany.

What is your expectation of WGC2010? What are the benefits of WGC2010 for Indonesia?

We want to prove to the world that Indonesian commitment to reduce emission, one of which through the utilization of geothermal power, is actually done, that is by the acceleration of electric installment development by using renewable energy of geothermal power. In WGC2010, the Indonesian government disseminates this message to the world: follow Indonesia!

Further more, we want to promote Indonesian tourism as well. Tourism has been our concern since



Star Energy Geothermal (Wayang Windu) Ltd (SEGWWL) is private Indonesian energy producer. It operates one of the largest geothermal power projects in Indonesia (the “Wayang Windu” geothermal power plant) which is located 40 kilometers south of Bandung, in the province of West Java. The geothermal reserves are located within a 12,950 hectare concession area located close to the town of Pangalengan.

Wayang Windu commenced commercial operations in June 2000 from one 110 MW geothermal turbine-generator unit. The Company increased its installed generation capacity by 117 MW in March 2009 with the start of commercial operations of Wayang Windu Unit 2, raising total installed capacity to 227 MW. The facility now contains two turbine/generator units, housed in the largest single geothermal power station in Indonesia. The facilities provide base load generation capacity to the JAMALI (Java-Madura-Bali) high voltage electricity transmission grid of PLN (Indonesia’s state-owned electricity company).

SEGWWL has a Joint Operation Contract with PT. Pertamina Geothermal Energy and an Energy Sales Contract with PT. PLN to supply up to 400 MW to PLN for 42 years.

On February 12th 2010, SEGWWL closed a five-year issue of US\$350 million of secured notes. The issue was 2.85 times oversubscribed, attracting almost US\$1.1 billion in total orders. Of the total bonds sold, 44 percent went to buyers in Asia, 40 percent to the United States and the rest to Europe. Standard Chartered Bank, Barclays Capital and Nomura were the lead banks for the bond sale, which was marketed in Hong Kong, Singapore, London and the United States. The success of the Bond issue reflects international market confidence to SEGWWL performance.

SEGWWL is planning to use a portion of the funds raised from the bonds, as initial capital for a 130 MW expansion project at Wayang Windu which is scheduled to begin operation in 2013. The expansion project is part of phase 2 of the Indonesian Government fast track program for development of an additional 10,000 MW of electricity generation capacity in Indonesia within the next decade, of which 3,583 MW is expected to be provided by geothermal.

Apart from Wayang Windu field, Star Energy Geothermal, through a national competitive tender process, was granted Jailolo Geothermal Concession area in 2009. Jailolo geothermal field is located in the West Halmahera Regency of North Maluku Province. At the moment, Star Energy conducting exploration survey to study the feasibility of the geothermal area. The Jailolo geothermal development is one of the first geothermal development after the Indonesian government issued the Geothermal Law No. 27 of 2003 and the Government Regulation No. 59 of 2007.

Star Energy also operates the Kakap PSC Block in the Natuna Sea, which produces oil and gas in partnership with Premier Oil, Singapore Petroleum, and Pertamina. The gas that is produced is sold to Sembawang Corporation in Singapore through the West Natuna Transportation System sub-sea pipeline, of which Star Energy is also an owner.

In addition, Star Energy holds PSC exploration blocks in Banyumas (onshore central Java), Sebatik (on/off-shore north east Kalimantan) and Sekayu (onshore south Sumatra), three of the most promising oil & gas blocks in Indonesia. Star Energy is currently drilling an exploration well in the Sekayu PSC, and plans to drill Sebatik by the end of 2010. The Company also holds promising CBM interests in Sumatra.

The Star Energy Group is one of the leading organizations in Indonesia in terms of its local community interaction, development and support. Star also has an outstanding record in terms of environmental management and care for the safety and health of its workers. Through its well established “Bright Star” program and company charter, it encourages a focus on values and business excellence across its entire organisation.

Star Energy programs have been acknowledged through the receipt a number of prestigious awards from the Indonesian Government in 2008-09 including: Gold and Green PROPER Awards for environmental management and community development (Star’s Gold award is unique in any industry sector in Indonesia); a Gold PADMA Award for Corporate Social Responsibility; and a number of Aditama Awards for safety and sound environmental management practices. SEGWWL has also maintain international certification of ISO 14001 for environmental management system and OHSAS 18001 for occupational health and safety management system. Throughout the years of operations, Star Energy has proven its care and commitment to not only achieve the highest value to its shareholders but also extend excellent services to its stakeholders including the community.

WGC2010

Nusa Dua, one of the world's best tourist spots



NUSA Dua is an exclusive tourist haven located at the southern tip of Bali island.

Only 25-minute ride from the Ngurah Rai international airport, the area offers natural attractions of scenic white sandy beach with a rumbling sound of waves.

The 350-hectare area is a compound of luxurious star-rated hotels that Balinese people have been proud upon, since this place is hailed as one of the best tourist destinations in the world.

Tourists can walk or cycle around the hotel compound comfortably on well-constructed pedestrian and bicycle lanes.

Nusa Dua has been widely known as the center of star-rated hotels, such as Ayodya Resort --which used to be the Bali Hilton International, Grand Hyatt, Nikko Hotel and Nusa Dua Beach hotel. The area is managed by the Bali Tourism Development Corporation (BTDC).

Many choices of international-class hotels providing premium quality of accommodation and hospitality service are available here.

This place is undeniably a perfect hideaway from the hustle and bustle of urban situation.

Hotels in this area offer facilities of conference, which is able to accommodate thousands of participants.

Built in Balinese style of architecture and ornament, the hotels reflect a combination of luxurious and traditional ambience.

Most of the hotels throughout Nusa Dua are situated along the seashore, except Swiss Grand, Novotel Nusa, The Bale, and Sekar Nusa Resort.

Tourists can also visit merchandise shops, restaurants and bars, by walking several minutes from their hotels or taking free shuttle services available in most of the hotels.

You don't need to worry when you feel bored of staying at your hotel all day long, just call your hotel's officers to take you to the nearest shopping centers or dining spots.

An elite tourist area in Badung regency, Nusa Dua is named after its geographical condition. It is situated in a hilly and barren peninsula in the eastern coast of Bali's southern tip.

Local people call it 'Nusa Dua' since there are two islands there that distinct it with other areas. In local word, 'Nusa' means island and 'Dua' means two.

One of the islands, bigger than the other, is a sanctified place. There is a sacred temple there named Bias Tugel, where a wise Javanese Hindu priest Pedanda Sakti Bawu Rawuh wrote the poem *Seban Bangkung*.

The temple is actually just a naturally-formed rocks resembling a chair. Locals once tried to build a wall around it, but the wall was swept away by the waves. The people then constructed a temple, but again, the strong waves ruined the building. Thus, they believed that the temple should be kept just the way it was.

To respect the Gods of the Bias Tugel temple,



A surfer enjoys the big waves

the priest then built two temples at the beach. The temples were decorated with traditional umbrellas that Hindus usually use in religious ceremonies, as well as a sarong with black-and-white square motif.

Local people in Bualu area take good care of these two temples, as they pray and bring offerings to the Gods of the temples everyday.

Developed since 1974, Nusa Dua has complete facilities that tourists need to spend their holidays, including golf course and water sport facilities.

Interesting spots in Nusa Dua

- Tourists visiting Nusa Dua usually enjoy shopping and dining.
- Upon entering the gate to the area, you will see some cafes and lines of small shops selling merchandise.
- Water sport facilities are also available at the nearby Tanjung Benoa, only around 5 to 10 minutes ride from Nusa Dua.
- The water sports offered in Tanjung Benoa are Parasailing, Banana Boat, Jet Ski, Rolling Donut, Flying Fish, Snorkeling, Scuba Diving, Glass Bottom Boat and trip to Turtle island.
- Waves in Tanjung Benoa beach are relatively calm, sometimes with no wave at all, thus safe for the whole family.

PARASAILING: Enjoy roaming through the sky some 80 meters above the Tanjung Benoa beach on a parasuit pulled by a speed boat. It takes 4 minutes for a round.

JETSKI: Riding on a motorcycle-like vehicle on the beach, you can have an instructor to drive the jetski or ride it by yourself for 15 minutes per round. Instructors usually will drive you from the beach to some meters away to the ocean, then you can take your turn to drive. It will be more challenging to drive through the waves.

BANANA BOAT: Take three friends of yours to ride

a rubber raft pulled by a speed boat and go around the beach. You will be accompanied by an instructor during the 15-minute ride. To get more excitement, ask the instructor to turn the raft upside down.

FLYING FISH: Wondering how it feels to fly like a kite? Try flying fish. This game combines three banana boats and another rubber boat with 'wings' on its both sides. Flying fish can be played by two persons, each stay on both sides of the rubber boat, and one instructor stay in the middle.

You can choose to stand up on the boat or lying on it. The boat will then pulled by a speed boat until it flies some two meters above the water.

SNORKELING: Just put on your mask and fin, and enjoy seeing the colorful underwater scenery of ornament fish and coral reefs.

SCUBA DIVING: A set of complete diving equipment are available for rent. Each person will be assisted by one instructor while exploring the underwater.

Before getting into the water, everyone will be briefed about how to dive properly. Beginner can try diving between 3 to 7 meters from the surface for around 40 minutes. Tourists are also allowed to feeding the fish.

GLASS BOTTOM BOAT & PULAU PENYU: No need to get wet to enjoy the underwater scenery. You can join the one-hour trip of sailing while observing the beautiful coral reefs and ornament fish through the glass-bottom boat. The boat will then take you to the Penyu Island to visit turtle hatchery and breeding site. In the island, you can also take pictures with tame birds, bats and snakes.

Besides water sport facilities, some hotels also offer Camel Safari or riding camel for an hour along the Nusa Dua coast while enjoying the beautiful beach and the warm breeze. 🐪

Short Course:



Introduction to
Geothermal Energy
Patra Hotel,
Jakarta, April 22, 2010



John W. Lund gave short course on
Geothermal Heat Pumps
BICC, Bali April 24, 2010



Richard G Campbell
explained design,
construction and
operation of geothermal
power plants
BICC, Bali
April 24, 2010

ORANGUTAN: WGC2010 MASCOT

THE World Geothermal Congress (WGC2010) picks out Orangutan as its mascot. Wearing the "udeng" (a traditional Balinese hat), the Orangutan holds a leaf in his left hand and a globe in his right. Since Bali has been chosen as venue for the World Geothermal Congress 2010, he also has a frangipani stuck on one of his ears to portray the typical Balinese.

Found particularly in the islands of Sumatera and Kalimantan, Orangutan is chosen as the mascot because the species is now in the brink of extinction due to forest destructions. Developing the environmentally-friendly geothermal projects will support the lives of the remaining species.

Irresponsible and uncontrolled human activities are constantly damaging their habitat and it is predicted that today, the Orangutan's population only remains 100,000.

This is why this particular specie was chosen as mascot because of its relevance to geothermal energy projects that do not bring negative impacts to the environment.

The exploration of geothermal wells does not create damages to plantations or forests since there is no exploration waste and fallen trees can be re-planted.

The Orangutan species need to be preserved as much as there is a need to increase geothermal energy for daily usage. 🌱



GLOBE

THE globe in the hand of the Orangutan portrays the world whereby geothermal energy is found along "the ring of fire" surrounding the continents. The green color symbolizes renewable energy and conservation of the eco system, two features that are important to human lives worldwide. 🌱



WGC PRACTICAL SUSTAINABILITY INITIATIVE TO BENEFIT LOCAL SCHOOLS

THE WORLD Geothermal Congress is taking a practical initiative to support sustainability and benefit local schools.

How many conference satchels do you have in your closet back home? Quite a few probably! While they're very useful at the time, we think it is better for them to be used (and for the sponsors logos to continue to be seen!) rather than sitting in a cupboard and never seeing the light of day again. This is sustainability in practice which for people attending a renewable energy congress should be second nature.

So the Organising Committee and Pacto Convex have arranged to distribute unwanted material to local schools, through the services of a local branch of an international humanitarian organisation (<http://www.onenessheart.org/>).

If this is to work we need YOUR help.

It's very simple. All you need to do is:

1. Put any unwanted conference materials such as writing pads, pens etc into your conference satchel
2. Hand the satchel into the registration desk before you leave the congress

That's all there is to it! Many thanks in advance



DO & DON'T

Balinese Hindus always accept visitors regardless of their nationalities and backgrounds. Thus, you are guaranteed to be warmly welcomed everywhere you go. However, several DOs and DON'Ts below are worth noticed.

do

Smile is Balinese universal language of communication, even if you don't understand a word, just smile and they're going to smile back to you and vice-versa.



Take a SARONG or at least a SCARF with you anywhere you go, so you can mingle with a local at any ritual ceremony.



Always carry a bottle of water. Tap water in Bali is not safe to drink.

don't

Never step on or run over a religious offering, usually placed on streets, junctions or house entrances.



Don't turn on your camera flash when you want to take a picture of someone praying. 🌱

PRACTICE AT LEAST 3 WORDS

Permisi (**per-me-see**) : Excuse me

Apa Kabar (**are-par-car-bar**) : How are you?

Terima kasih (**tri-ma-car-see**) : Thank you



Human Energy™

Delivering Energy for the Future through People, Partnership and Performance

The world's appetite for oil and other energy sources is growing dramatically, with energy consumption internationally projected to rise by about 33 percent by 2030. The growing demand is fueled by a burgeoning population that will increase about 20 percent in the next 20 years, with most of that growth in countries with emerging economies, such as China and India. Rising energy demand from economic output and improved standards of living will put added pressure on energy supplies. At Chevron, we recognize the world needs all the energy we can develop. We are developing energy resources that will help build a secure and diversified energy future. One of our renewable sources is geothermal energy. Today, we operate more geothermal energy capacity than any company, public or private.

The Leading Global Geothermal Producer

Chevron began geothermal operations during the 1960s in the western United States by pioneering the development of *The Geysers*, which is the world's largest geothermal field. Other geothermal projects in the US were also developed during the 1970s and 1980s.

Chevron pioneered the development of geothermal energy in the Philippines and is the leading producer in Indonesia. Overall, Chevron geothermal operations supply 1,273 megawatts of installed capacity, enough clean and sustainable energy to meet the needs of 16 million people in both countries.

In Indonesia, Chevron's two geothermal projects in West Java, Salak and Darajat, can generate 636 MW of electricity. This represents over 50 percent of the country's total geothermal production, which supports Indonesia's growing economy, and powers approximately 3.9 million homes.

In the Philippines, Chevron successfully pioneered the development of the country's geothermal industry in partnership with the Philippines government in 1971. We operate steam fields that provide geothermal energy to the Tiwi and Makiling-Banahaw (Mak-Ban) power plants located in the Albay and Laguna-Batangas provinces. These facilities supply 637 MW of geothermal capacity - enough to support the electricity needs of more than 7 million Filipinos.

On June 11, 2009 the Darajat III Geothermal Project developed by Chevron, under contract to Pertamina and PLN (Indonesia's state-owned electricity company) in West Java, Indonesia, received its first Certified Emission Reductions (or CERs) from the UN agency that administers the Clean Development Mechanism of the Kyoto Protocol. This milestone recognizes Chevron and

the Republic of Indonesia's commitment to developing renewable energy sources.

Number One Oil Producer in Indonesia

Chevron produces over 40 percent of Indonesia's crude oil, making Chevron the country's largest oil producer. From our onshore oil fields in Sumatra, we manage the world's largest steam-flood operation at the Duri Field, as well as extensive water-flood operations at the giant Minas and Kotabatak Fields. In East Kalimantan, Chevron operates offshore oil and gas production fields. The natural gas is then transported to Bontang, one of the world's largest liquefied natural gas (LNG) facilities.

Developing Partnership, Empowering Communities

Chevron does more than provide energy. We believe that by investing in people we all benefit. Our programs engage communities and individuals, empowering them to promote sustainability, and help deliver long-term socio-economic benefits. These programs target the communities in which we operate and demonstrate our commitment to being the partner of choice.

Chevron's programs are anchored in partnership with governments, communities, local and international nongovernmental organizations, and development agencies. Most programs invest in our three primary focus areas - improving access to basic human needs, enabling education and training opportunities, and promoting sustainable livelihoods.

To learn more, visit us at www.chevron.com

