



WGC2010

Daily News



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

Issue 5 / April 29, 2010

Bali International Convention Centre, Nusa Dua, Bali-Indonesia


COLUMN

WGC2010

NEWS on IDDP IDDP Drilled into Magma



ALEX
PRESSMAN



THE IDDP (Iceland Deep Drilling Project) was originally planned during the WGC - 2000 and so celebrates its 10 year anniversary here at WGC-2010. Accordingly there are some 15 IDDP related presentations running at this conference (1457, 2118, 2121, 2129, 3901, 2902, 3903, 3904, 3905, 3906, 3907, 3908, 3909, 3911, 3912), which will be presented Monday, Tuesday, Wednesday and on Friday (when a special IDDP session will be held).

The first full scale 4-5 km IDDP drillhole was to be drilled in 2009 – within the Krafla geothermal field NE-Iceland, while an earlier attempt in a well of opportunity at the Reykjanes geothermal field SW-Iceland in 2006 had to be abandoned for technical reasons. However, the first real deep, full-scale IDDP well at Krafla in 2009, did not meet our expectation as we unexpectedly drilled into >900°C magma – at only 2100 m depth. The magma was drilled into 3 times, but the drillstring got stuck the first 2 times without us detecting the presence

WGC2010

Panel Discussion on International Collaboration



A HIGH-POWERED panel met on Wednesday morning to discuss the topic. The panel members were Chris Bromley from New Zealand representing IEA, Paul

Quinlivan from SKM, Gudni Johannesson who is the Director of the Icelandic National Energy Authority and Professor Rahmat Witoelar, Executive Chair of the Indonesian National Council on Climate Change. Each presenter gave a short pre-

sentation, which then provoked a lively discussion from the floor. Key facts and issues were:

Current and future research and international collaboration under IGPT and IEA-GIA were described.

Professor Witoelar gave an interesting comparison of the Kyoto Protocol and COP13 from Copenhagen, emphasising that some of the big advantages of the Copenhagen accord are that both developed and developing countries will



Panelists at the global geothermal development panel discussion

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WGC2010 : NEWS on IDDP IDDP DRILLED INTO MAGMA.....

of molten rock. In the third attempt the drill bit got stuck again but the crew managed to pull out and maintain circulation. After a while red-brown circulating water and then light and dark-brown pumice and obsidian (rhyolitic glass) was returned to the surface. This interesting but difficult drilling will be described in some of the papers (e.g. 2129, 3902). Since August 2009 the IDDP well has been heating up after several months of cooling. Finally, by the end of March 2010 the first flow test began and is still on-going. The initial results will be described in presentation 3906 Friday. This drillhole may offer the possibility to create the hottest EGS system in the world - if technical and funding problems are solved.

A number of IDDP related scientists and engineers are present at this conference – keen on discussing the details of the project. At WGC-2000 the IDDP program invited the international geothermal community to participate and collaborate with us on the IDDP project. The offer is still valid and repeated here at WGC-2010 (3901 poster). We hope in the near future to drill two more full-scale IDDP drillholes to 5 km. Drilling of the next one could possibly be realized in 2011. The chief contact persons here at WGC-2010 are the PI's: Gudmundur Omar Fridleifsson and Wilfred A. Elders, the engineers Sverrir Thorhallsson, Bjarni Pals-son, Sveinbjörn Hólmgæirsson and Kristinn Ingason, the geochemist Halldór Ármannsson, among others.

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 : Panel Discussion on International Collaboration...

take responsibility for curbing GHG emissions, that agriculture and forestry are now included, and that COP13 is moving towards an economic transformation programme rather than an environmental treaty.

IEA estimate the future potential of geothermal energy is to provide 1.7% of global energy demand by 2050, including a 45% increase by 2030. This could be achieving using known hydrothermal resources only (though in practice other resource types will also be used).

Much of the discussion centred around CDM. Paul Quinlivan pointed out that the global market for CDM is estimated to be US\$18B to 2012, but that geothermal is only 0.4% of that. Although this is a significant achievement, with 9 projects registered and

3 in process (all in Indonesia), there is much more that could be done. The complexity of the process and the lack of resources for the certifying agency were seen as difficulties, as was the uncertainties of what will happen after 2012. Professor Witoelar and a representative from World Bank reassured the audience that the CER market will continue until at least 2020 and that there are moves to streamline the process.

The recent announcement by the Indonesian Government to allow geothermal development in conservation areas also raised some concerns, but the sustainability criteria for CDM were seen as way of moderating this along with government moves to prevent forest fires and do re-forestation.

COLUMN

Statistics of the WGC2010 Technical Program

BY ROLAND N. HORNE

1039 papers were submitted. 650 will have been presented orally and there were 280 posters (which include reserve papers). This is 50% bigger than in Turkey in 2005, where there were about 700 papers total. WGC2000 had 670 papers and WGC1995 had 535. Furthermore, there are 262 session chairpersons and 150 technical reviewers at WGC2010.



Technical Program team of WGC2010 Co-Chair Prof Roland Horne and Dr. Nenny Saptadji from left to right : Cipto Adi, Zuher Syihab, Anief, Budy, Mutia, Roland Horne, Rizqia, Nenny Saptadji, Sutopo, Ali Ashat, T.A Fauzi Soelaiman

AGENDA | April 29, 2010

08.30am – 10.10am	Technical Session	Room A-J
10.40am – 12.20pm	Technical Session	Room A-J
12.20pm – 01.20pm	Lunch Break	
01.20pm – 03.00pm	Technical Session	Room A-J
03.30pm – 05.10pm	Technical Session	Room A-J

WGC2010 SILENT AUCTION OF PAINTING CONTINUES.....

Take part at the Silent Auction of WGC2010 Paintings Exhibition Competition! Bid price starts from US\$200 depending on their categories. The successful bidders will be announced at the Closing Ceremony on Friday, 30 April 2010.

WGC2010

United Nations University at the WGC2010



Dr. INGVAR BIRGIR FRIDLEIFSSON

Director UNU-GTP



AMONG the 2500 participants of the WGC 2010, there are well over a hundred former UNU Fellows, graduates of the United Nations University Geothermal Training Programme in Iceland (UNU-GTP). A total of 139 UNU Fellows from 31 countries are authors or co-authors of 199 papers published in the WGC 2010 Proceedings. The papers are divided between 25 technical sessions.

The UNU-GTP awards travel fellowships for the WGC 2010 to 83 former UNU Fellows (amounting to USD 1500 and USD 2000, depending on the per capita income of the respective countries). The Board of Studies of the UNU-GTP is of course very proud of these excellent professionals who have been our students and many of whom are now amongst the leading specialists in geothermal development in their respective countries/continents.

Seventy seven former UNU Fellows from 25 countries attended the WGC 2005 in Turkey in 2005. Most of them received travel fellowships funded by the UNU-GTP in Iceland and the UNU Centre in Japan. Sixty one UNU Fellows attended the WGC 2000 in Japan (out of 227 graduates at that time), and 35 the WGC 1995 in Italy (out of 161 graduates).

The UNU-GTP policy to support the participation of former UNU Fellows who are first authors of refereed and accepted papers in the World Geothermal Congress every five years (since 1995), has made it possible for a large number of professionals from all continents to share their research results and experience with the international geothermal community. Their enthusiasm and hard work gives them the opportunity to keep up with new technical developments as well as the pleasure of meeting friends and colleagues from various parts of the world, reminisce about the past, and plan for the future. These are the pillars of the network of UNU-GTP Fellows worldwide. 🌱

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The ENGINE Coordination Action

(ENhanced Geothermal Innovative Network for Europe) <http://engine.brgm.fr>

—PHILIPPE CALCAGNO (*p.calcagno@brgm.fr*)

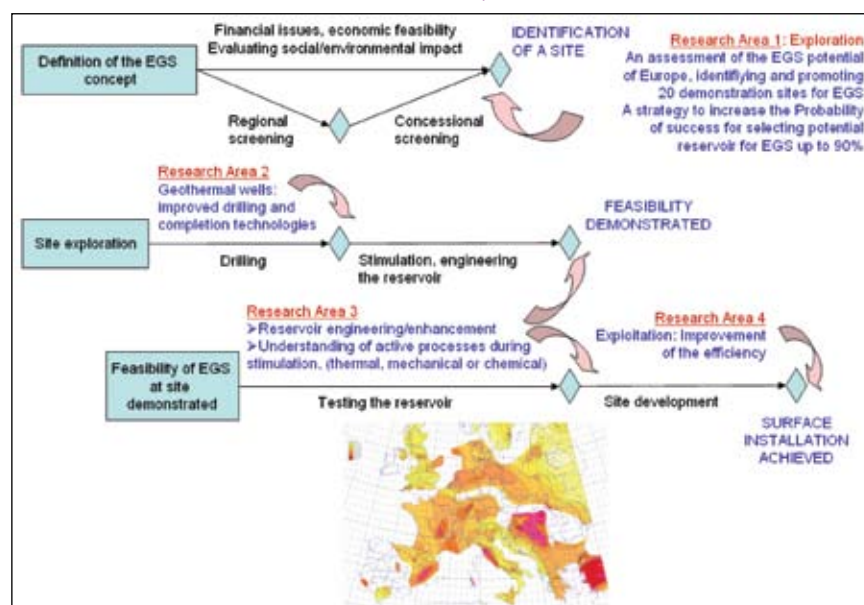
Thursday April 29, 3:30 - 5:10pm, Room A, Session Number: 16A



THE development of geothermal energy is one of the key areas in the European Strategic Energy Technology Plan, which targets to have 20% of the European Union's energy supply coming from renewable sources by 2020.

Joint Programme on Geothermal Energy of the European Energy Research Alliance (JPGE-EERA) and the Geothermal Engineering Integrating Mitigation of Induced Seismicity in Reservoirs (GEISER) project under the European Commission's 7th Framework Program.

The main research areas defined by ENGINE.



From 2005 to 2008, a group called the ENGINE Coordination Action, co-funded by the European Commission, was set up to support R&D initiatives for Enhanced Geothermal Systems (EGS).

Thirty five partners were involved in this initiative, representing 15 European and three non-European countries.

Over three conferences and seven specialised workshops, scientists in the group proposed a strategy to guide decision makers and the industry in the development of EGS in Europe. A handbook defining the best practices and a road map proposing strategic research areas for mid-term demonstration projects was produced (see figure).

The network and task force formed during ENGINE are now actively developing EGS in Europe, besides working with the international community and exchanging information on geothermal energy.

The ENGINE Coordination Action has led to spin-off action groups such as the

TO LEARN MORE ABOUT ENGINE:

1. ENGINE Talk presented by Albert Genter on Thursday at the World Geothermal Congress 2010 (details below). Get a chance to meet Albert Genter who is ENGINE's representative at the WGC2010.
2. WGC2010 proceedings. ENGINE paper number: 3117.
3. ENGINE Website: <http://engine.brgm.fr>.

THE ENGINE COORDINATION ACTION
(ENhanced Geothermal Innovative
Network for Europe)

Philippe Calcagno, Albert Genter, Ernst Huenges, Martin Kaltschmitt, Costas Karytas, Thomas Kohl, Patrick Ledru, Adele Manzella, Sverrir Thorhallsson, Jan Diederik van Wees

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Geothermal Energy in Australian Universities



REFLECTING the upsurge in geothermal energy investment in the industry in the last ten years, Australian universities are developing a research and education interest in geothermal energy.

The Queensland Geothermal Energy Centre of Excellence of the University of Queensland offers scholarships for post-graduate research in geothermal energy power conversion and exploration. The Centre accepts post-graduate scholarship applications from geology and engineering graduates. Information about the Centre research can be found on www.uq.edu.au/geothermal.

The Western Australian Geothermal Energy Centre, a partnership between the University of Western Australia and CSIRO, has a focus on direct heat use technologies (e.g. geothermally powered air conditioning and desalination) for use in population centres where there is shallow groundwater of moderate temperature. The Centre pursues research with a focus on Perth Basin geology and the generic issues facing direct use of geothermal energy. For details, see www.geothermal.org.au.

The University of Adelaide with support from the South Australian State Government established a Geothermal Energy Research Centre last year with a focus on reservoir geology and reservoir modelling.

In addition to these three universities that have established Centres on different aspects of geothermal energy, various Australian universities offer post-graduate research opportunities on geothermal energy topics.

While different Australian universities specialise in different areas, they collaborate with each other to provide research services and post-graduate scholarship opportunities across the geothermal energy sector. Interested students are advised to search through the web sites for the individual universities for further information. 🌱

Western Pacific Branch: New Kid on the Block Already Making Waves

An interview with Jim Lawless, Chairman of the Western Pacific Regional Branch of the International Geothermal Association.

Q: So what is the WPRB ?

A: It is a regional grouping of affiliated organisations which are a part to IGA

Q: Why have yet another organisation ? Isn't IGA enough ?

A: No, not in our opinion. IGA has to cover the whole world, all types of projects including direct and electrical use and all types of resource, so can sometimes be very broadly focussed. The IGA By-Laws allow for the formation of Regional Branches to address that issues, but the only one that had ever been set up was the European one.

There was already a long history of technical cooperation between New Zealand, Indonesia and the Philippines, and perhaps to a slightly lesser extent Japan, on high enthalpy electricity generation projects. So those were the countries that I initially discussed forming the Regional Branch with.

Now that actually changed fairly quickly, in that China asked to also join the group even before it was formally established, which we were pleased to accept and that has extended the range of interests to lower temperature generation and direct use projects. Our Chinese colleagues have already made a large contributions to the successful operation running of the WPRB. More recently we have included Australia, so that has added another dimension again.

There is also pragmatically the issue of credibility when soliciting funding. If an organisation based in only one country asks an organisation such as the ADB for funding to hold a technical seminar, for example, I believe that they are less likely to get a positive response than if they are approached by an organisation representing multiple countries, with over 500 members.

Q: So only people from those 6 countries can join ?

A: Not at all. Those are the countries in the region with affiliated organisations, but people from other countries can still join on an individual basis as long as they are IGA members, and several people have done so from countries as diverse as Korea, Mongolia and Papua New Guinea.

Q: So the WPRB was only set up at the end of 2007. What have you achieved so far ?

A: So far we have mainly concentrated on technical seminars. Seminars have been held in Indonesia, New Zealand, China and Australia. In each case local experts have made a contribution, with invited guest lecturers from New Zealand, the Philippines, Australia and Germany. In each case we have tied the timing of the seminar to an existing conference held by the host organisation, and have designated that conference the Regional Conference for the year which I believe has helped in terms of generating international interest. So it's a win-win situation. The Proceedings from all of the seminars are available for a modest cost from the SKM booth in the exhibit hall.

I want to emphasise that the WPRB is very much a partnership of equal. Every country has something to contribute, whether it be in technology or case studies. We can all learn from each others.

Q: So what about the future ?

A: There so much that we could do if we had more time and money ! Ultimately I would like to see us with our own website to foster regional cooperation, more technical interchanges, and ideally a scholarship programme.

Q: Who do we see about membership ?

A: Come to the IGA booth in the exhibition hall, or see me or one of the other members of the governing Forum: 🌱

Graeme Beardsmore

Larry Bayrante

Tian Tingshan

Kevin Brown

Alimin Ginting

Toshihiro Uchida

Australia

Philippines

China

New Zealand

Indonesia

Japan

Symphony of Renewables: A Revolution



WGC 2010 In the wake of the global financial, economic, climate change and energy crises, renewable energy is at the forefront of the world's imagination now perhaps more than it has ever been before.

Energy production and use is becoming more low-carbon, more efficient, more renewable and ultimately more

sustainable. The phenomenal growth in renewable energy development since the turn of the century is radically changing the global energy landscape. In order to seize these unprecedented opportunities, it is critical that renewables, like a symphony, work together in order to better realise their enormous potentials and transition the world to a more renewable future. This session will

be presented in a panel format by representatives of Indonesia's renewables sector and the International Renewable Energy Alliance (REN Alliance, www.ren-alliance.org): Ms Mahalath Halperin, Vice President, International Solar Energy Society, Mr Andrew Lang, Director: Board of Directors, World Bioenergy Association, Dr Ladislaus Rybach, President, International Geothermal Association, Dr Erwin Sadirsan, Indonesian Renewable Energy Society (METI, www.meti.or.id), Mr Lau Saili, Senior Policy Analyst, International Hydropower Association.

Each panellist will introduce themselves and their respective organisations, giving an overview of latest developments. The session will then move into a panel-audience discussion, focussing on the synergies between the various renewables.

**The session will run on
Friday, 30 April 2010,
08:30-10:10, Session 17.B,
Friday 30 April, Room G**

Lecturers and Students of Geothermal Graduate Study Program of ITB attend WGC 2010



SOME of the lectures and students and the Geothermal Graduate Study Program of ITB that attend WGC 2010

In order to get new information and update of geothermal technology, approximately 80% of lecturers and 75% of students from the Geothermal Graduate Study Program of Institut Teknologi Bandung (ITB), Bandung, Indonesia are attending the WGC 2010. The study program opened in 2008 to accommodate the need of man-power in the rapidly expanding geothermal field in Indonesia estimated as 120-200 man-powers per year. In addition to attending the Congress, the lecturers and students also belong to the Technical Committee and act as co-chairperson in many sessions. The Congress is also attended by the Dean of the Faculty of Mining and Petroleum Engineering-ITB, Prof. Dr. Ir. Sudarto Notosiswoyo, M.Eng. and the Dean of Faculty of Earth Sciences and Technology-ITB, Ir. Lambok M. Hutasoit, Ph.D. The Co-Chair of the Technical Committee of the Congress, Dr. Nenny S. Saptadji is also the Chairman of the Geothermal Graduate Study Program. Further information on the Geothermal Graduate Study Program can be found in <http://www.ftm.itb.ac.id/en/index.php?content=prodi&id=8>.



Establishment of Indonesian Geothermal Center of Excellence (IGCE)

DR. NENNY S. SAPTADJI presented the plan for the Indonesian Geothermal Center of Excellence (IGCE)

During her presentation in WGC 2010, Dr. Nenny S. Saptadji announced that the Indonesia Geothermal Center of Excellence (IGCE) establishment has been proposed to BAPPENAS (Agency of the National Development and Planning), Indonesia last March 2010 to be included in the Blue Book of BAPPENAS. Within the next three years, IGCE programs will include Education and Trainings, Research, Data Management, Geothermal Disaster Mitigation, Data System Development and Direct Use. The IGCE is expected to bring together experts from Indonesia and other countries. Several countries, geothermal companies (e.g.: PT. Pertamina Geothermal Energy, and Star Energy) and educational institutions (e.g.: Institut Teknologi Bandung and Stanford University) have expressed their interests in supporting the IGCE.



WGC2010

Indonesia is Uniquely Positioned to Expand...

MR. BARRY ANDREWS,
President and GM of Chevron Geothermal Indonesia



CHEVRON generates more than 630 megawatts of clean, reliable and affordable geothermal energy for Indonesia. Chevron Geo-

thermal manages two geothermal projects in Indonesia—Darajat and Salak, both on the island of Java. The Darajat project supplies geothermal steam, which generates 259 MWe. Chevron holds a 95 percent operating interest in Darajat. Chevron has a 100 percent operating interest in the Salak project, one of the largest geothermal operations in the world, with a total operating capacity of 377 megawatts. The combined output now produces sufficient renewable energy to supply approximately 4 million homes in Indonesia.

As a long-term partner of the energy sector in Indonesia, we offer expertise in

reservoir management, the application of leading technologies, project management, operational excellence, and a focus on safety. In return we seek a stable legal and regulatory regime, open markets that are created by long-term contracts or competitive markets, and long-term prices that offer certainty of payment. Chevron has long-term plans to grow its geothermal business in Indonesia and we are continuing to explore opportunities in key geothermal areas. We are committed to assisting Indonesia realize its geothermal potential.

Chevron is proud to support the World Geothermal Congress and we look forward to the geothermal sector globally taking the lead to ensure our industry can help meet the on-going energy demand growth by utilizing an environmentally sustainable energy resource.



“Significant Investment Momentum Can Be Generated...”

DR. BRET MATTES,
Managing Director and CEO of the Star Energy Group of Companies



STAR Energy Geothermal operates the 227 MW Wayang Windu facility in West Java (which will grow to 360MW by 2013), and the newly issued Jailolo geothermal license in Halmahera (North Maluku) which is the subject of a commercial feasibility study at the moment. Projects like Wayang Windu have helped to raise awareness of the potential of geothermal and shown that while initial capital costs are high, maintenance costs are so low that geothermal is significantly cheaper than coal-fired power on a life cycle basis.

The Indonesia Geothermal industry has the potential to grow rapidly here. The President has told the world that Indonesia is aiming to have about 5GW of geothermal in production by 2014-15. At the moment there are many barriers to achieving this goal, some

political, some commercial, some bureaucratic. But the Government is aware of the issues and is striving to create a commercial and regulatory climate that will encourage investors. If it succeeds, we believe significant investment momentum can be generated – enough for the Country to be producing 10GW of sustainable, renewable, reliable geothermal electricity by 2020.

The WGC is the “Olympics” of geothermal. Star Energy is proud to be the Diamond Sponsor of the WGC. I think it is timely that this WGC is being held in Indonesia—blessed as it is by the best geological and geographic settings for geothermal in the world, Indonesia is entering an era in which it will become the world leader in geothermal—the incubator for developing new technologies and expertise.

SNAPSHOTS!

WGC2010 participants having a wonderful evening at the Indonesian Cultural Night at Garuda Wisnu Kencana



Correction from the Editor: On WGC2010 Daily of 28 April 2010, photo caption on the left side should have been written Toshiba Corp.'s steam turbine. We apologize for the inconvenience caused.

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- ★ Geothermal application with ORC (Organic Ranking Cycle) binary cycle or Kalina closed cycle using ammonia/water mixture.
- ★ Cryostar Turbines can also be integrated in waste heat based energy recovery cycles.

SNAPSHOTS!

Poster Session (top), Free wine at Allied Industrial Engineering — Parsons Brinckerhoff (middle), Herman Darnel Ibrahim interviewed by BBC (bottom).



How will the geothermal business opportunity grow worldwide?



DR ERIN L. WALLIN, *GNS Science*

It is definitely growing all over the world. I know Indonesia has a large components and opportunity to make it grow, the same thing happens in New Zealand. And I believe it is happening in other countries.



LUCIEN Y. BRONICKI, *Ormat*

The worldwide (geothermal) industry is growing and we are proud to be part of the development. Ormat has made more than 1,000 MW power plants worldwide. Currently we are producing 100 to 150 MW a year. The capacity will increase to about 200 MW a year by next year. That indicates how the market is growing.



ASKAR KARTIWA, *Antareja Resources*

Geothermal is a very promising energy source because it is locally used and having sustainable price. It is not affected by international benchmarking like oil and gas. With the flexibility, blanket guarantee and political will being synchronized with investment, Indonesia can be the world's largest geothermal user and laboratory, as expected by President Susilo Bambang Yudhoyono.



ALEX SMILLIE, *Star Energy*

Within five years from now the geothermal (industry) in Indonesia, like the United States, will grow by 100 percent. The rest of the world will be very much the same. Other countries will be doing so. Think of it as a newly developed industry.



SUPRAMU SANTOSA, *Supreme Energy*

The commitment made by the Indonesian president should be taken into action by state administrations, PLN and investors. It takes these three pillars to develop geothermal. Basically, this congress is a good starting point. A move sponsored by API and the Energy and Mineral Resources Ministry should be consistently be carried out. And now, our focus is to succeed the 4,000 MW project, it's a challenge for us. If we're able to cope with the challenge, we will see a good development of geothermal in the future.



MICHAEL SUMARIJANTO, *Bimasena*

This is a defining moment for the development of geothermal in Indonesia and around the world.

The government, the private sectors and the stakeholders should join efforts to capitalize on this potential. The president has also said that we have a road map on geothermal development. I think this is a very excellent political will that we should support.

WGC PRACTICAL SUSTAINABILITY INITIATIVE TO BENEFIT LOCAL SCHOOLS

WGC2010 Organizing Committee and Congress Organizer PACTO CONVEX have arranged to distribute unwanted materials to local schools through the services of a local branch of an international humanitarian organisation www.onenessheart.org. For this, please put any unwanted conference materials such as writing pads, pens etc into your conference satchel and hand the satchel into the Registration Desk before you leave the congress.