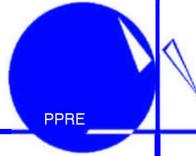


CARL  
VON  
OSSIIETZKY  
*universität* OLDENBURG

Postgraduate Programme  
RENEWABLE ENERGY



# NEWSLETTER

No. 1/2003 – Vol 22

## EDITORIAL

Dear Reader—another batch of PPRE has graduated in summer 2002: the 15<sup>th</sup> group of PPRE participants received their documents & certificates on the 6<sup>th</sup> of September. We had a wonderful graduation session and quite a few things to celebrate: 200<sup>th</sup> absolvent, fifteen years of programme and important guest speakers (see detailed report with pictures on page 3) and the members of the new batch could see how things are running.

The wind of change again has struck PPRE *again*. The head of our programme, Dr. Jürgen Schumacher, who took the helm in 1997, moved to Stuttgart to take over new duties (see page 42). Michael Golba, well know to the older alumni because of his questionnaire based impact studies, moved into Dr. JS' position on 1<sup>st</sup> January 2003.

A change of the structure of PPRE is 'ante portas' – the time for the thesis project will be extended and more intermediate examinations will be guide the participants after 2004.

We are experiencing an eventful year 2003 and will keep you posted via e-mail, PPRE-L and the issues of this newsletter, which are available in electronic form at <<http://www.ppre.de/>>. Please check our new Web layout and give your comments  
Happy reading and good wishes from Oldenburg

*Konrad Blum*

PS: Well, if you can imagine to contribute news, articles or even jokes to the next issue (02/2003) of the PPRE Newsletter, please make your contribution arrive before 1<sup>st</sup> June 2003.

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Hello Santiago,

All the time we felt a gap throughout our Graduation Ceremony. It's very clear that this gap is only of you and Ernest. We were missing you most because your experience, your great skills of leadership, management and coordination.

But we were to celebrate our Graduation Ceremony without your presence. You will be glad to know that the program went through as per our plans and preparations. I am sure that you will also get some feedback messages from other PPRE colleagues. Besides our PPRE supervisors, there were external guests from Sweden and DAAD. We got the chance to listen inspiring words from Prof. Pfaffenberger, Prof. Broman (from Sweden), Dr. Sylvester (DAAD), Prof. Peinke, Dr. Blum and Dr. Schumacher. I should not forget to mention, that the President of University was present and gave a speech. Afterward, the session was handed over to the students by Dr. Blum.

Jordi gave some nice comments and suggestions on the overall evaluation and impact of PPRE in his glamorous look. Asliddin spoke something which was out of our imaginations, he delivered his impressions and future prospects after PPRE. Xavier was given the task of saying inspiring and catalytic words for the new PPRE colleagues.

Lastly, the publication, we were to settle down with the preliminary version to give some popularity and to highlight the efforts we have invested this year. Panos and Alejandro arranged a nice party and I was almost drunk after the whole event.

I hope we will remain in touch in future.  
Anand Shukla

## 15 YEARS PPRE

On Friday the 6th of September 2002 was *Graduation Day* for the absolvents of PPRE 2001/02. We enjoyed the successful *finale* of the 15th run of the programme together with invited guest speakers, with the speakers from the staff, the Dean, the President of the University and the representatives of the fresh Masters of Science, who all gave us very good and entertaining lectures. I personally think, we most enjoyed Prof. W. Pfaffenberger's dry humor and brilliant jokes. Two of the PPRE graduates had already travelled home because of pressing duties. One of them, the spokesperson of the course, Santiago Sanchez (Honduras) sent us his speech by e-mail (see box on page 4). He would have liked to give the address in person to his friends and colleagues (see Anand Shukla's letter to Santiago Sanchez about the Graduation event on page 3) and to the guests (including most of the next PPRE generation), as well as families and friends.

Another speech that took to the hearts of the audience, was Jordi Avelaneda's contribution to this event (see second boxes on page 4), which due to an intervention of the President of the University, has been published in 'UNI-INFO' of CvO University. A lot of group photos were taken (see fig. 1.2) and a nice long party at Energielabor completed *Graduation Day*, which will be in the memory of all of us, as a most touching event.

## PPRE Anniversary Publication Project

Anand Shukla, Anil Misra and Mazharul Islam have, on the occasion of 15 years PPRE, combined their efforts and edited a publication with contributions from alumni, present PPRE students and external experts. This project was heavily supported (and made feasible only) by financial support of DAAD, for which editors and authors are very grateful.

## NEWS FROM OLDENBURG

### EHF becomes EUREC member

The Department EHF (Energy and Semiconductor Research – see <<http://www.physik.uni-oldenburg.de/ehf/>> for a description of the research fields.), the 'mother organisation' of PPRE, became a member of EUREC (European Renewable Energy Centers Agency – <<http://www.eurec.be>>). The agency is an influential lobbying group for Renewable Energy at the European Commission in Brussels and has forty well known member institutions all over Europe. EUREC also runs an International Master Programme on Renewable Energy and has inquired if PPRE is willing to participate, in fall 2004. More news about this new development can be expected in the next (02/2003) issue of this newsletter.

Dear Colleagues and Friends,

Mixed feelings remain after this year in Oldenburg. A status of excitement and joy after accomplishing a goal in life, and a the sadness to leave the friends made at the beautiful Oldenburg and depart home. But isn't this what life is all about? Every moment brings these opposite situations and it is up to us to decide what do we want to make of it: whether an opportunity to share our hopes and dreams, our knowledge and happiness with the others, or just to confine to ourselves and stay away from reality. This time in Germany has taught me that no matter who we are, where do we come from, what our origins are, the most important thing is to realize that we are part of a carefully prepared plan that brought us here. We can do whatever we strive for, and if I have somebody next to me I can indeed start making a difference. The leanings we have experienced have opened up not just the window of knowledge and the possibilities of a new future, but our very inner soul has step up to a new level, one that very few people can achieve. We were selected from our countries to come here, and we are somehow responsible for the thousands who didn't have this chance to study abroad. I have now part of you within me, and you are also sharing myself. Our bonds are tied forever and we cannot betray each other. In our countries, in our jobs we will act as representatives of each of us. We will show that the future can be forged for the better if we really work hard into it, stating our opinion and standing before the opposition of well-settled and old fashioned institutions and people relentless to change. (...) Our reality of coming from the so called "developing" country instead of being a burden is a blessing. We now have the best of both worlds, we are able to understand why is it that in our countries the poor people, with no future, money or food, can enjoy the simple things of life, whereas in the first world the number of suicides increases, where spare time can be bought at a vacation resort, but no real happiness abounds. (...) We are now striving to new endeavors in life, some of us will initiate a different activity, others will return to their previous jobs, but there will always remain the experience we had in Germany, the many friends we made in our colleagues and professors. We will always be there but depends on us if we nurture this relationship or just let it die out. I think this is not the end but the beginning of a new enterprise, one which will take us to new challenges. The diploma we are now receiving is a commitment to improve the situation in our countries and bring the technology to remote and needed rural and urban areas, to improve the efficiency of the energetic processes, to start up new industries and open up new jobs, to start making a better and cleaner world for our children. It is a difficult task indeed but we will succeed, with the help of all we can do it.

Thanks for letting me share this year with you and wish you the best always. I can proudly now say: Oldenburg, Mi País!!

Santiago Sanchez September 6, 2002

President, Dean, staff of the PPRE, colleagues, relatives and friends all,

It is for me a great pleasure to give you all an overall picture of what the PPRE has meant to our group. First, I will talk about the group itself, then I will continue with an evaluation of the course to finish with some hints about renewable energies and their future. Twenty people from fourteen different countries of four continents began a dream one year ago, this dream was called Postgraduate Programme Renewable Energy and had to take place in a city located in the North of Germany (near Bremen, as everybody says) called Oldenburg. Today, the 6th of September 2002, I can state that the whole of the batch, the twenty, have arrived to the very end of the programme. Unfortunately today we are only eighteen, two, Ernest and Santiago, already left to meet their families and their jobs in their hometowns, in Rwanda and Ecuador. We miss them much. Anyway, their spirit is today between us. Twenty out of twenty. One could think that this course has been just a happy love story with a happy end. Yes, for sure it has been a love story that we will never forget, but plenty of ups and downs and obstacles (diseases, visa problems, accelerated course on bike riding). We come mainly from sunny countries and Oldenburg's weather differs much from ours. We still remember the hard winter days when the lectures began at 8:30 am with a dark and rainy sky and finished around 6 pm with a rainy and dark sky. Furthermore, we have been away from our homes, our families, our friends, our environment and hearing a language that, after one year, is still quite hard to understand. However, Oldenburg received us as special guests and after one year we are proud to call ourselves Oldenburg's sons. With so many cultures and religions mixed in one pot, we have been a small scale experiment of how the dialogue is always possible independently of one's origins. Integration has not been an easy task, but mostly it had more to do with the colour of our soul than with the colour of our skin. In this end, we realise that we have not reached the utopia target of becoming a united group, but, at least, we are able to accept each other and recognise our differences. Concerning the Postgraduate Programme Renewable Energy itself, let me first thank the President of the University for inaugurating and attending to this Graduation Ceremony. The Carl von Ossietzky University was pioneer in the renewable energy education. After fifteen years of the PPRE programme, more than two hundred absolvents have graduated and have spread their knowledge and the name of this University and this city throughout the planet. We recognise and thank the commitment of the university towards this Master Course. However, we are convinced that renewable energies have a bright and promising future, and therefore we kindly ask for a step forward in terms of human resources and economic support. Thus, this institution would for sure become a leading university within this field. We are glad to know that some steps have already been made in that direction. .continued...

..continued..

The course, as a whole, can be qualified as positive. On the one hand, after one year we have realised that we have learnt much from renewable energy systems, from the electron-hole pair to the 1 MW photovoltaic plants, from the Navy-Stokes equation to the huge off-shore wind farms, from the chlorophyll molecule to the big biogas plants and thus, I could give an endless list of examples. I would like to mention specially the Case Study which helped us to link the theory learned in the first semester with the real world. On the other hand, I think that it is also important to mention in this evaluation some points of the programme that should be improved for the future years; like the absence of feedback in our activities mainly due to the overload of the staff, the problems with the external practical trainings that could be solved with a closer collaboration between the university and the companies involved in this field, and the lack of summer lab experiments due to meteorological phenomena which, for sure, Dr. Heinemann would explain better than me. We would also like to stress the feeling of our batch of being in the Energie Labor somehow outside of the University and the Physics Department activities. Anyway, this is not a day to look much backwards, let's look forward. The Rio+10 summit in Johannesburg, South Africa, took place last week. In the agenda of the conference and in the portfolios of the countries, renewable energies had an important role. Despite not reaching any agreement about future targets, few people would have thought some years back that renewable energies would be a focus of any international conference. It makes me recall some words of Mahatma Gandhi that could be adapted to renewable energy. First: they laugh at us. Then: they fight us. In the end: we win. The first step is nearly overcome; let's see how long the second step takes. In the beginning of the 21st century 2 billion people have no access to any kind of conventional energy, they just rely on firewood which leads to deforestation. In Africa, 90We came here to Oldenburg to dive into the world of renewable energies as an option towards human development, after one year they quenched us and became part of our lives. I would not like to finish without thanking all of the people that have walked with us in the long way till this 6th of September 2002. Thanks to all of the staff of the Postgraduate Programme Renewable Energy, for the knowledge you have shared with us and for all the good moments we have shared. Hopefully, we will keep in touch in the future so as to build up a useful and operative renewable energy network. Thanks to all of our wives, husbands, parents, children and friends, who understood that it was important for us to devote one year to our education in that field. Thanks to our God, whichever name we give him or her, who was there in the darker nights and in the brighter days.

We got it.

Jordi Avellaneda de la Calle  
Oldenburg, 6th September 2002

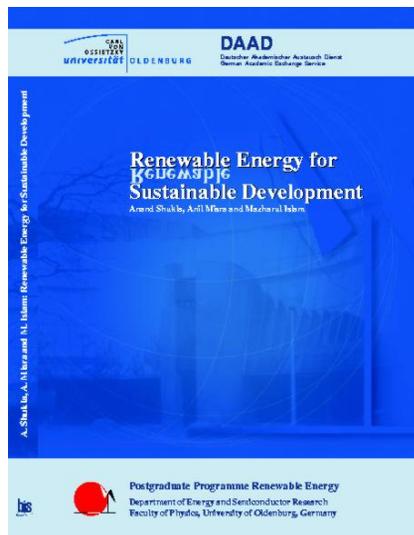


Figure 1.1: Title page of publication



Figure 1.2: PPRE 2001/02 with certificates

The scope of the publication (see coverage in fig. 1.1) is given by the back cover text as follows:

Renewable Energy Technologies (RETs) will contribute to the improvement of the well being of present and future generations through the promotion of sustainable development. These technologies are now accepted worldwide as an alternative option for the world's future energy supply. Depending upon the present utilisation, RETs have been used either to enhance the capacity of power generation in a sustainable, environment friendly way, or are considered for providing the basic energy needs in remote and isolated regions.

This publication is a part of worldwide networking activities. Students from the present and past groups of the Postgraduate Programme Renewable Energy from different countries have contributed their experience with RETs and their application to this volume. Furthermore external experts working in reputed organisations and institutes have also shared their expertise by providing articles for the publication on *Renewable Energy for a Sustainable Future* [ISBN 3-8142-0837-4].

### Solar-Workshop at Emden

In Summer the PPRE Students were invited by Bernhard Gläser, Germany (PPRE00/01) to attend a one-day solar cooker workshop at the research-group of Prof. Weiler at the University of Applied Sciences in Emden. (<http://spot.fho-empden.de/hp/weiler/kitchen.html>)

After a summary about research activities by Prof. Weiler (fig. 1.3) the main focus of the workshop was the presentation of the solar reflector cooker, which was constructed by B. Gläser during his M.Sc thesis project. While presenting, the power of Sun was used to prepare the early lunch, which were steaks (fried in a pan – see figure 1.4) by using the solar cooker. Each steak took less than 20 Minutes



Figure 1.3: Prof. Weiler introduces the solar reflector cooker



Figure 1.4: B. Gläser prepares a meal

to be thoroughly done – quite an impressive demonstration !!

At the end of the day the Solar Cooker was carried to the Energielabor at Oldenburg University where it was used for lab sessions in the summer 2002.

### THE NEW PPRE 2002/03

At present the 15 new students (see figure ) of PPRE02/03 have finished the first weeks of



Figure 1.5: The new batch in wthe wind

winter term and are now working on country reports, assignments and exercises. They are looking forward to their practical training period in Feb–April 2003.

### Participants of PPRE02/03

Names and countries of origin of the present students are listed in table 1.1. Their individual e-mail addresses can be found at the end of the table of alumni and participants (A snapshot of the new batch at DEWI test field gives figure 1.5). To reach the whole group with a single e-mail just send a message to [students0203@ppre.de](mailto:students0203@ppre.de).

## NEWS FROM PPRE ALUMNI

**Butchaiah Gadde (India–PPRE-01/02)** wrote about his work after coming home: "I joined my old company in Bangalore and I am working on some proposals about setting up a company. The company will operate on the complete spectrum of renewable energy, environment and clean developmental mechanisms (CDM). And also paralelly I am trying for a new job. I am applying in various companies like Shell

Table 1.1: PPRE02/03 Participants

NAME	COUNTRY
Alice Ghopai Asaah	Cameroon
Marco Peter	Germany
Pudji Irasari	Indonesia
Shao Jie	China
Galsan Sevjidsuren	Mongolia
Jhantu K. Saha	Bangladesh
Anteneh Gulilat	Ethiopia
Fernando Vega	Honduras
Joo Yeol Lee	Korea
Manoj K. Khadka	Nepal
Subhash K. Mishra	Nepal
Juan José Trujillo	Colombia
Gianpiero Nacci	Italy
Ihtsham F. Choudhry	Pakistan
Alejandro Bango	Spain

Solar, TATA BP Solar, GE and companies working on fuel cell development here in India. I don't know which Idea will be going to click."

[<b\\_gadde1@hotmail.com>](mailto:b_gadde1@hotmail.com)

**Md Saiful Islam (Bangladesh–PPRE00/01)** wrote us recently: "How are you? As you know I am currently doing PhD in Belgium. I am specializing on grid-connected PV systems. I have published a paper on sizing inverters which I presented in the conference "PV in Europe" held last month in Rome. It might be interesting to you. I have attached it herewith. (See page 33

[<saiful70@yahoo.com>](mailto:saiful70@yahoo.com)

**Awa Celestine Anyam (Cameroon–PPRE98/99)** sends us an article: "I am sending herewith the privatization of Cameroon's National Electricity Cooperation for publication in our PPRE newsletter – Privatization of the National Electricity Corporation of Cameroon, SONEL, has represented a major step in rehabilitation of the country's electricity sector. This could be particularly beneficial for future development of the country's substantial hydro-potential. The Govern-

ment is now making major efforts to ensure the effectiveness of private sector participation."<sup>1</sup>

<c\_anyam@yahoo.com>

**Mesbah Khan (Bangladesh–PPRE-99/00)**

, who is employed at the System Loss Monitoring Unit at Dhaka Electric Supply Authority in Bangladesh, sends us the following news: "I am trying to take further study in Energy areas as vast and in HVAC/Building passive energy (wind+solar) in particular. By the way, I am eager to receive PPRE newsletter regularly. I have been missing that since I left Oldenburg. I am also interested to take part in the sharing process of views and knowledge through newsletter. So, I would request you please drop me a message when PPRE newsletter begins to collect views from all PPRE fellas for the next issue." and some weeks later he writes: "Dear Edu!!!

How are you these days? I do hope you are doing well and going fine as well. I started my research work in the area of energy systems. I lost Udo's e-mail contact. Sometimes I want to chat with Udo via e-mail and want to discuss about some fruitful laboratory experimental works. Could you please send me Udo's private/personal e-mail address? Convey my best wishes to Dr. Blum, Udo, Andrea, and all others who continuously helped and guided us during gaining our knowledge at Uni-OL.

Hope for the best and have nice times.

Mesbah

<mesbah\_khan@hotmail.com>

**Santiago Sanchez (Honduras–PPRE01/02)**

had to return after exam

rather quickly, and wrote in October: "Just to tell you that I am doing well. Received today a confirmation for a temporary consultancy for WWF project in the Galapagos that will keep me busy for a couple of months. Looks like things will improve after these two months in Ecuador and the 'sabbatical' year in Oldenburg." And he added: "I am really involved in biomass energy and are looking for some companies interested in investing in Ecuador, mainly for wood gasification and biodiesel. There are true business possibilities. I am now preparing sort of a manual of RE for high school students of the Galapagos islands. Nice work, I am advising the WWF (World Wildlife Fund) for a short time, and things look very promising in the future. How is the new batch doing?"

Also he wrote on 4.11.2002 to his years's alumni list <alumni0102@ppre.de> the following: "Dear Friends, It seems that the volcanoes in Ecuador got a little upset after knowing that I was going to work on solar PV instead of geothermal which is what we have in large quantities. The height of the dome is 15 km!! This has been a large eruption, the city of Quito was closed. Work will be back to normal tomorrow but there is a lot of ash in the streets. I spent the whole day cleaning the house. It is not really the ash we see on a fire but charred (burned down) rock, it looks more like sand. No casualties have been reported but there is a lot of damage on crops and farms. The damaged area covers 20000 km<sup>2</sup>. Total tons of ash in Quito are more than 1.2 million. Well, I found an excuse to send a big hi to everyone. Take care and don't forget to write!

<ecoelec@hotmail.com>

**Mazharul Islam (Bangladesh–PPRE00/01)**

sends us news from Bangladesh: "Biogas comes as a blessing for Md Yad Mahbub Khan and his neighbours at Hazipur village in Manikganj who now will pay only Tk 200 for monthly gas burner

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<sup>1</sup>as the article of *Awa Celestine Anyam*, titled THE PRIVATIZATION OF CAMEROON'S NATIONAL ELECTRICITY COOPERATION 'SONEL', is quite voluminous, we offer to send a copy as PDF file or hardcopy to everyone who is interested.

charge instead of Tk 1000 for firewood. Mahbub Khan is the lucky one among 20 house owners who got connection from a biogas plant, financed by Arab Bangladesh Bank Limitet. A local entrepreneur, Zakir Hossain, ventured the plant to make the best use of chicken excreta of his poultry firm. Arab Bangladesh Bank sanctioned a Tk 35 lakh loan for the poultry firm and additional two lakh for the biogas plant. The biogas plant generated huge enthusiasm among the villagers who wants expansion of the plant to have their household connected with the service. The plant has now a capacity of 20 burners, enough for daily cooking of a five-member family. All the 20 connections have already been booked. Encouraged by the facility of chicken excreta-based biogas plant, other poultry firm owners in Shaturia area are imitating the same on their premises. Some villagers expected that time is not far away when all households of Hazipur would use only biogas for cooking replacing conventional firewood. Inaugurating the Desh Biogas Plant and Desh Poultry Ltd yesterday, AB Bank Managing Director CM Koyes Sami said use of biogas is the most economical and environment-friendly way of cooking which can also save time of neglected village women. Koyes Sami said, 'The village entrepreneurs should be offered collateral-free loan at very competitive interest rate so that more investment goes to village to generate more employment.' Since overall economic development of the country largely hinges on development of villages, other banks should come forward to offer loans to village entrepreneurs at a lower rate of interest. Speaking on the occasion, Proprietor of Desh Biogas Plant and Desh Poultry Ltd Zakir Hossain appreciated the role of AB Bank in the project." (Published in the Daily Star on April 29, 2002)

Another message from Mazharul read: "Currently I am involved with several projects covering Solar PV, Wind Resource Assessment,

Micro Hydro and Biogas fired electrification project - so, professionally I am quite satisfied that I got the chance for learning and implementing different RETs projects. Additionally, I am helping several other organization to develop Tidal, SHS and biogas-utility projects. I believe, nobody else in Bangladesh got such opportunities like me and I am really satisfied with these tasks. But, the only problem here is non-technical (social problems) and due to this kind of problem I don't feel like to stay in Bangladesh.

Meanwhile - you might know that I have been maintaining the sole energy web site of Bangladesh, called Shakti (URL: <<http://shakti.hypermart.net>>) since 1997. I am inviting you to browse through 'Shakti' for info regarding energy sector, including renewables, of Bangladesh and you can download the electronic book (E-book) on 'Assessment of Renewable Energy Resources Of Bangladesh' from <<http://shakti.hypermart.net/publications/ebook1.pdf>> and another E-book on 'Utilization of Renewable Energies in Bangladesh' from <<http://shakti.hypermart.net/publications/ebook2.pdf>>. If you have time, you can read this two e-books for getting an overall idea about the RETs sector of Bangladesh."

<[shakti@dhaka.net](mailto:shakti@dhaka.net)>

**Jordi Avellaneda (Spain-PPRE-01/02)** writes about his work after PPRE:

"I am writing to you just to announce that I have finished my first two PV grid-connected installations. They are quite small, just 3.8 kWp, but my effort is there, in the roof of two schools in a village in the nearby of my hometown. I am really happy and I wanted to share this feeling with my colleagues.

Life keeps going, although the memories of the good days in Oldenburg will always remain."

<[ordi.avellaneda@innova.coop](mailto:ordi.avellaneda@innova.coop)>

**Tang Hui (China–PPRE00/01)** was working for WINDSOLAR AG company in Darmstadt after finishing PPRE in 2001. In May 2002 he returned to Beijing, China, to work for the same company as a consultant engineer.

<tang\_hui00@hotmail.com>

**Bernard Osawa (Kenya–PPRE-96/97)** sends real good news:

"Dear Alumni Members,

This is to inform all my friends that I will be graduating into the Married men's club. As you may already know (maybe not), Daisy and myself will be getting married on June 8, 2002 at Consolata Shrine Westlands, Nairobi. We are extending an invitation to you all to attend and celebrate with us this occasion. If you are not able to attend, then let your prayers and wishes be with us.

We hereby attach an (jpeg) invitation card for you. Our apologies for not being able to drop this card physically.

Sincerely Daisy and Bernard."

<solar@iconnect.co.ke>

**M. Augustus Leon (India–PPRE-93/94)** answered a request from B. Parthan on PPRE-L: "To my knowledge, there are two organisations investigating on White LEDs on their possible application in PV lighting systems:

1. Grameen Shakti

Grameen Bank Bhaban,

Mirpur - 2,

Dhaka - 1216, Bangladesh.

Tel: +88 02 9004081

Fax: +88 02 803559

E-mail: g\_shakti@citechco.net

Contact: Mr. Dipal C. Barua, General Manager

2. Center for Renewable Energy

P. O. Box 589, Ga-2/717 Bag Bazaar

Kathmandu, Nepal

Tel: +977 1 248852

Fax: +977 1 226976/ 247414

E-mail: cre@vishnu.ccsil.com.np

Contact: Mr. Rajendra Bahadur Adhikari,  
President

Hope you will get some interesting information.

<retsas@AIT.AC.TH>

**Palitha L.G. Kariyawasam (Sri Lanka–PPRE92/93)** who is Director of RE-section at Ceylon Electricity Board (CEB), sends us an article about wind potential in his country (see p. 39). He writes: "we (CEB) carried out a wind energy resource assessment study in Puttalam and Central parts of Sri Lanka. This was carried out from year 2000 and we have completed collecting collecting wind speed and direction data at 08 measuring locations. The report is just completed and I wish to annexe an extract from the report for the next publication of newsletter."

Together with the German Wind Energy Institute (DEWI) in Wilhelmshaven, the CEB have organized a Training Course on wind resource assessment and grid integration in Sri Lanka. It will be held from 5th to 14th November, 2002. They expect 25 participants (all local) for the training course.

<pmktr@ceb.lk>

**Md. Mozammel Hoque (Bangladesh–PPRE99/00)** is now working as Jr. Instructor in Mechanical Engg. at the Kushtia Polytechnic Institute, Bangladesh after changing jobs in remote areas of Bangladesh three time before. He has started a new project: "I am informing you with very respect that I am working on : Solar Paddy Boiling System. My am is to design and construct a solar boiler for boiling paddy. It is very important and feasible in Bangladesh,

because the main food of Bangladesh is rice. Rice is produced from paddy and paddy is harvested from paddy plants. After harvesting, the paddy has to boil two times using water vapor or steam and after boiling, the paddy has to dry in the sun. We get rice performing the three following steps: (1) Boiling the paddy, (2) dry the boiled paddy, (3) Husking and separating rice. Then it is called rice and it is ready to sell in the market. . So, to boil the paddy, a lot of energy is need. Conventionally in Bangladesh, paddy has to boil by using of wood and paddy husk burning.

But I want to boil the paddy by using solar energy instead of burning wood and paddy husk. I have collected data from field, typically paddy contains 67% rice and 33% paddy husk. By using solar energy for paddy boiling, a large amount of paddy husk will be saved. The paddy husk is a good fuel. There is a large demand for paddy husk in the market. Because the paddy husk will be used in cooking purposes in the village, heating the road materials for road constructions, burning bricks, poultry and cattle feds etc. So the cooking problems in Bangladesh will be solved. On the other hand, a large sunny brick constructed paddy drying yard (open space) is required to dry the paddy in the sun. I have collected data from field, typically, 1000 m<sup>2</sup> open space is required for drying the previous boiled paddy and ten men or women have to engage for 5 days to dry the 5 tons of paddy and should keep continuous attention for protection of paddy from rain. Sometimes, during the drying period paddy wets by the sudden raining and damages. Typically, every production cycle contains 5 tons of paddy. It is very costly. The maximum portion of capital is to engage for buying the paddy drying yard and its construction.

Nearly 25000 US \$ is required for buying the paddy drying yard and its construction. But I want to use dryer for drying the paddy. It will occupy very small space and cost is very less than that. It will protect paddy from rain and will reduce labour, cost etc. Photovoltaic

modules will be used to power the husking mills."

<mozammel\_hoque@kst.bdc.com>

**Dr. Rejane Moraes-Duzat (Brazil-PPRE88/89)** responded to the last newsletter edition: " Nice to hear from you! I would like to thank you for keeping us informed (super idea!)." She visited Oldenburg in July 2002.

<duzat@inpa.gov.br>

**Heang Bora (Cambodia-PPRE-01/02)** communicated in November that he returned to Cambodia safely and started to work in his field immediately. He was out in the provinces to supervise installation of solar home systems.

<heangbora@hotmail.com>

**Johnny Nahui Ortiz (Peru-PPRE-93/94)** had a few question related to wind energy: "Glad to hear that the www.ppre.de is alive again!

We have also received a couple of wind energy-related questions, perhaps some of you may be willing to share a few answers:

1. What's the *physical* meaning of "k" (shape parameter) and "c" (scale parameter) in the Weibull distribution?
2. Are there any other distributions (besides Weibull / Rayleigh) that might have been tried in order to explain wind patterns / regimes?
3. Could you recommend any customized software associated with any of the above?

<jnortiz@amauta.rcp.net.pe>

**Ram P. Dhital (Nepal-PPRE01/02)** has recently joined Water Resource Consult P (Ltd.), a private consulting firm working in the field of hydro power development in Nepal. At the moment, he is responsible for making the feasibility study of Singati Khola

small hydro power projects (6 MW). Furthermore the Institute of Engineering has recently started renewable energy course and he is planning to work as a part time lecturer here in Kathmandu.

Later he wrote us: "Everything is fine and my professional life is going very well. I am very much engaged in the component design and analysis of hydro power projects. We are now trying to develop one community solar farm in one of our programme district where there is no possibility of hydro power generation. The programme is being funded by GEF/UNEP and the field level implementation is being carried out by Rural Reconstruction Nepal, the largest development NGO of Nepal."

<rpdhital@yahoo.com>

**Juan Roberto Paredes (Colombia-PPRE00/01)** gave a lecture on 'Project Development for Wind Parks' in June '02 in PPRE, which was about aspects relating to the optimisation of energy output through site and layout optimisation, general aspects in the development of wind projects with examples from Germany and Spain, and a presentation of the standard simulation software (Wind-Pro) where some of this optimisation criteria can be calculated and processed. He writes: "I heard about the course 'Distance Learning Course on Energy Economics'<sup>2</sup> offered for PPRE people this term. I wanted to know if there is a possibility for me, as a former PPRE student to take part in this first "try". Because of my work I often have to travel to Spain but I am most of the time in OL, so I could also take part in course sessions.

If there are still some places available I will be pleased if you can inform me about any chance in participating and other conditions

required.

Juan Roberto"

<uanro@gmx.net>

**Mirela Kamberi (Albania-PPRE-96/97)** reported: "I just received the Newsletter No. 1/2002 - Vol 21 after a long time from now without any news from Oldenburg. I left everything else and went through it up to the end, fully impressed while Germany's memories came over. I am so glad hearing everything continues in very good shape there, you are still doing the same appreciated job with Newsletter, Dr. Blum and Dr. Schumacher and the other known staff are still contributing to the Programme and even the Winter and Summer Terms of PPRE are quite the same with that of ours (1996 - 1997). Thank you very much for sending news from Oldenburg and from PPRE Alumni as well.

Now some news from myself: I am working since June 2001 as the Director of Environmental Pollution Control and Prevention Directorate in the Ministry of Environment, after a long time in the National Energy Agency as Head of Electricity and Renewable Energy Department. Even though I left the energy field, I am still involved since promotion of renewables and energy efficiency is one of the objectives to be reached by my Directorate as a way to reduce the negative environmental impact of the Energy Sector. From the other side I have been involved during the last two years as Team Leader for the GHG Abatement Analysis under the GEF Project 'Enabling Albania to prepare its First National Communication in response to its commitments to UNFCCC-United Nations Framework Convention on Climate Change' and the Energy&Transport Team Member for GHG Inventory and Vulnerability Assessment under the same project. We finalized such a big document recently and I will try to summarise the findings and send to you since promotion of renewable energy is one of the

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<sup>2</sup>Prof. Pfaffenberger, Prof. Meyer-Renschhausen (Darmstadt) and Ms. Kaisa Kinnunen (BEI) offered the DE course in the summer term 2002 for PPRE students

important measures foreseen to be undertaken in the energy abatement scenarios 1994–2020 for Albania.

Relating to renewables, I will start after efforts to teach this year the full course on renewables at the University of Tirana, Faculty of Environmental Engineering, Energy Branch. I am sure it will take me too much efforts and energy, anyway I will try to keep in touch with your Postgraduate Programme for consultancy and probably cooperation.

Others? I am often involved as renewable energy consultant and recently I have tried with a diploma thesis of one of the students of the Mechanical Engineering Faculty to work on the field of geothermal energy and its possibilities to be feasibly exploited in Albania.

Besides all, you know that I am now mother of two boys (Bjorn is 7 years old and starts going to school this coming September and Arlen is only 15 months old). You know, being a mother and working full time in the Ministry and with projects afterwards is not so easy. However I feel quite happy with the progress I have done up to now."

<mkamberi@icc-al.org>

### **P.S. Mukherjee (India–PPRE89/90)**

sent us the following: "At present, I am heading a small Micro-credit Institution based at Pune, Maharashtra. The Organisation's name is DISHA. At present, we are 6 persons working for this Organisation. We work with the poorest of the poor women in both slums and villages. At present, we are working in 19 villages and 8 slums in the Pune District. So far, We have disbursed about Rs.22 lakhs (approximately US\$ 45000) to 600 women for income generation purposes. The women repay the loans in weekly instalments with an interest of 15% p.a. We also provide vocational training to these women and guide them in enterprise development. From January, 2003 we will start a micro-insurance scheme in association with a Government Insurance company

for these poor women. The objective of this programme is poverty removal through self-employment generation.

In addition, I have also been thinking of a new project with the objective of :

- Establishment of a vocational training and enterprise development centre for poor and specially women and unemployed youth.

- Establishment of a demonstration-cum-information resource centre for environmental technologies like renewable energy, agriculture and household.

- A micro-credit programme for poor women in 50 villages with an expansion capacity to 500 villages.

- Help in establishment of market linkages to artisans and others who will be part of the proposed project.

- Health awareness programme with special emphasis on HIV and AIDs.

The project will be implemented by me and will be located somewhere in between Bombay and Pune. Once I finalise the project I shall give details and contact you all. I believe that we should remove poverty from the planet through knowledge and skills that we have acquired and every human being should get a chance to live healthy and dignified life. As of today there are 2 billion people on the planet who live a miserable life. Everyday I come across many such people. I feel, all of us should make small efforts (while carrying out our day to day duties) to change this situation. Of course Renewable Energy professionals have a lot to contribute."

<???

### **Evelyn Magno Desendario, (Philippines–PPRE92/93)**

wrote the following after long time silence: "It's quite a long time you haven't heard from me, about a decade now since we finished our course in Oldenburg. Well, I'm doing fine. At present, I'm connected to a Brewery Company, in its glass container manufacturing division. This particular glass plant

has its own independent power generating unit (about 24 MW) to supply its energy requirement. I am pleased to receive a copy of the latest NEWSLETTER and going thru it, I was impressed with PPRE graduates for their continuous involvement and contributions to Renewable Energy. CONGRATULATIONS!! Also, I would like to take this opportunity to say hello to my colleagues, batch mate 92/93. Hope all fine after almost a decade now. After all, our study in Oldenburg involved memories and earned knowledge that stay not for a while but for a lifetime. More power to PPRE and to all our mentors."

<evemdesenario@yahoo.com>

**Liu Hui (China-PPRE98/99)** was involved in organising the DAAD Alumni Seminar on "Water and Development" - Topic I: "Water and Health"; Topic II: "Sustainable Management of Water Resources" (SURED-Alumni-Seminar) in Beijing from September 16 to 21, 2002. The program was organised by the University of Tübingen in cooperation with the University of Karlsruhe, the Peking University, the University of Darmstadt and the European Center for Chinese Studies, ECCS, Beijing. German and Chinese hydrologists, hydro-geologists, physicians and experts for water management participated in this event. The aim of the seminar was to get insight into the present level of knowledge concerning water management and the hygienic consequences of naturally or artificially caused contamination of surface and groundwater and/or on the lack of vital trace elements as well. Maybe Liu Hui will give us a more detailed summary of the seminar in the next newsletter?

<liuhui0508@online.sh.cn>

**Jan Lam (Netherlands-PPRE98/99)** living and working in Mali, reacted to the picture of solar meals being eaten by PPRE01/02 students (as sent to PPRE this



Figure 2.1: Solar meal at Energielabor garden

June – see fig. 2.1): "Here at 16.30 h we also still have bright sunshine, in fact it is still over 40°C. So it was yesterday and it will be again tomorrow. A solar man's paradise? Next week I will be a few days with my family in Bamako and they have an airco meanwhile I'm afraid my computer gets damaged by the sweat that runs via my fingers into the keyboard. In July we go for two weeks to the Netherlands so chances are that we will have rain and cold weather, lovely.."

and some weeks later Jan wrote again: "I still consider my own practical training as one of the most valuable parts of the course. Also I think we have something to offer to PPRE trainees. We have now more than 700 clients that we are servicing with the help of SHS's. By the end of next year this number should increase with another 1000 households. There are, of course, a number of structural technical problems such as protection of the battery against over-consumption (deep-discharge), energy theft and panel theft that we are working on. A student could focus on (one of) these items. I think, however, that it is even more interesting to look at our approach for rural electrification in a region with population with little financial means and where there is also barely any technical knowledge in the villages. In this part of the world the 'fee

for service' approach is new and the population's perception of the service and our marketing and promotion strategy might also be an interesting study object. If you have a student with a genuine interest in rural electrification by means of solar energy and who is willing to stay and work under the conditions we have here, he or she is most welcome.

I have no travel plans at the moment for a visit to the Netherlands. If a trip is planned I will let you know, it would very nice to visit PPRE-OL again."

<ssd@afribone.net.ml>

**Veronica Fuh (Cameroon-PPRE-00/01)** asked in PPRE-L: "I was asked the following question and I thought it nice to get more ideas from our wind energy experts before giving explanation to the lady. I would be happy if you could send it to PPRE alumni.

That how do we call the effect when the rotor blades of a wind turbine cause moving shadows on the ground which is often an issue for people living around the turbine. This moving shadow (shadow casting?) really disturbs some people, especially when it hits the window of a nearby house etc.

I will really appreciate any contribution  
Wishing everyone the best.

*fuverama@yahoo.com*

and got an answer from

**M. Augustus Leon (India-PPRE-93/94)** on PPRE-L:

"Dear Veronica,  
It's called 'shadow flicker'.  
Regards, Augustus Leon"

<<retsas@ait.ac.th

Thomas Jackson (PPRE97/98) answered also:  
"The name is shadow flicker, and it is more of a problem in higher latitudes with lower sun angles. Denmark recommends a minimum of 6-8 rotor diameters from the nearest dwelling. With 6 rotor diameters in Denmark, there can



Figure 2.2: Binu, Sham, Srikanth & Anil at RETScreen training in Delhi

be approx. 12 hours of this effect per year. Proper siting can minimize or eliminate the effects.

Also, the flashing effect is when the sunlight is reflected from shiny blade surfaces."

**Binu Parthan (India-PPRE97/98)**

as a member of the Small Scale CDM activities panel for the Climate Change Secretariat Binu travelled to Germany in June and July this year to attend two meetings of the panel in Bonn. Due to a very tied schedule he missed to visit Oldenburg University this time. In late October he informed us that he is attending a RETScreen training programme in Delhi - well interesting enough that actually 4 PPRE alumni from Oldenburg took part in that seminar, which are: himself, *Anil Misra* (PPRE 89/90), *Sham Sunder* (PPRE 99/00) and *Srikanth Subbarao* (PPRE 00/01). Actually all of them can be found on the photograph in figure 2.2.

<bp@itpi.co.in>

**Richard Morris (Australia-PPRE-96/97)** got self-employed recently. His company is actually an engineering office doing work for others but in the long term the aim is to develop their own product in the fuel cell field.

<r\_s\_morris@hotmail.com>

**Loukas Pilalas (Greece–PPRE-01/02)** some weeks after coming back to his country writes: "I would like you to be the first ones to know that I have been accepted in a greek company (Energetechniki) dealing with renewable energies (wind,solar and hydro) on national level, to work for a period of 3 months (before I join the army) starting from November 1st. I feel quite happy with the idea that I will apply things that I learnt in Oldenburg last year, that I will have the chance to get some more hands-on experience on renewables and get to know their application status in my country. Moreover, I plan to attend the 7th National Conference on Renewable Energy Sources which will be held at 6-8 November at the University of Patras and where all the new research and innovations within the greek territories will be presented. You can find more info about it at the website: <<http://helios.mech.upatras.gr>> or if you contact the people (my supervisor at the greek university) for a program of the conference (I already have one which is in greek language).

I send you my sunny regards from Greece and wish you a nice day..."

<[darkblue@lycos.com](mailto:darkblue@lycos.com)>

**Hassan Rakha (Egypt–PPRE88/89)** contributed to a conference on PV Applications organized by Photoenergy Center, Faculty of Science, Ain Shams University, Cairo, Egypt 27–29 May 2002, sponsored by UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION, International Center for Science and High Technology. He presented 'NREA Activities in Egypt'.

and:

[www.ics.trieste.it/documents/hightech/-pvsolar/activities/ws-may2002/Final%20List%20of%20Attendees.pdf](http://www.ics.trieste.it/documents/hightech/-pvsolar/activities/ws-may2002/Final%20List%20of%20Attendees.pdf)

**Alhousseini Issa MAÏGA (Mali–PPRE88/89)** wrote after some years: "Very, very happy, to be in contact with you again. I think that you will be very happy by hearing that I am steed working very hard to tray to get RE going one. The first new new is that in Mali from January 2002 to January 2007, there will be no taxes for RE equipment. With a project called PEPLS (lighting by solar energy PV), we finish to install 570 streets lighting systems, 400 houses lighting systems and 15 solar pumping systems in collaboration with the government of India. For the next coming days, we hope to be able to start a program for more than 2000 houses lighting systems, 120 solar pumping systems, 40 refrigerators.....

I forget tell you also that, we changed some part of ours mills called LESO II, and it start pumping water a gain in a village called...at about 300 km from the research center.

Now, more than 400 water healing systems are in work in Mali, let me tell you that it will be difficult to do the statistic of the RE equipment in Mali.

My best greating to my friend Ramesh M P from India who is going to be the executive Dierctor of Centre for Wind Energy Technology. Dear Ramesh don't forget to send me one wind mill or one wind generator. My greating to all from oldenburg and from RE group.

It will be nice if I can get a copy of the thesis of Risse, Oliver: Real life cost Analysis of PV pumping systems for Agricultural Irrigation in Northerm Chile (Dr. J. Schumacher)."

<[cnesoler@spider.toolnet.org](mailto:cnesoler@spider.toolnet.org)>

**Srikanth Subbarao (India–PPRE-00/01)** writes us about his new position: "Greetings from Pondicherry. Hope the summer in Oldenburg is enjoyable this year.I have joined IT Power India (Binu's organisation)recently.Hope now I wiull have more things to communicate.

Kindly forward the news letter to:

Srikanth Subbarao  
 IT Power India Pvt Ltd  
 No:6, Romain Rolland Street  
 Pondicherry- 605001  
 India

Convey my best wishes to all the present participants for there thesis and examination."

<kanthi\_vinu@yahoo.com>

**Hiwote Teshome (Ethiopia-PPRE-96/97)** sent us regards from Norway: "How are you? it has been a very long time since I wrote to you. I have an Internet connection problem at home that is the reason. I am now attending one of the International Summer School Programme in Oslo, Norway wit a title of Energy Planning and Sustainable Development. It is interesting and the course is the six weeks course. it has some field trip attached to it. How it things going on at the university? I feel always happy when I get our programme newsletter otherwise it seems that we do not have any media to hear about each other. greetings to all."

And a few days later, in a second e-mail: "This is a greeting from Oslo. How are you? It has been a very long time since I wrote to you. I have a problem of connection to the Internet at home. that is why I couldn't write you. I am in Oslo to attend a course " Energy Planning and Sustainable Development" organized by International Summer School. It is a six weeks course and has also a field trip component. I always feel great and being in touch when I get the newsletter of our programme. Otherwise we might not have a possibility of hearing about what is going one with other friends thanks to you people. I am still working in the GTZ-Household Energy Project. We became very successful and got an extension for the second phase that has been started in 2000 for the three years which also will be extended for another two years. I am very glad of what I am doing now. Samson Tolessa from 94-95 batch is also with me.

We are working together. It is two of us who are working as a local expert with the position of Household Energy Advisor."

<inku\_s@yahoo.com>

**Aravind PV (India-PPRE00/01)** returned to Oldenburg in May 2002 to give a one-day seminar on 'Biomass Gasification Technologies'. At the moment Aravind is doing his PhD research at the Combustion, Propulsion and Gasification Laboratory, Indian Institute of Science, Bangalore in cooperation with the Technical University of Delft, the Netherlands. He will return to the Netherlands soon and then again teach in PPRE.

<p\_v\_aravind@hotmail.com>

**Sham Sundar Subbarao (India-PPRE99/00)** send us his news and greetings: "My hello to everybody out their.

Regarding bio-diesel:

Yes, we did some work in the field of bio-diesel in our last academic year. A batch of pre-final year students took this as their topic for thesis work, under our guidance through CART (Centre for appropriate rural technologies, Mysore).

The student batch, studied properties of various vegetable oils. Coconut oil was choosen for their study. (At that time the price of coconut oil was drastically low and we thought, we can explore the possibility of using coonut oil as bio-fuel). A process called tran-esterification was done on co-conut oil to reduce the viscosity of the oil. we were sucessful in bringing down the viscosity of the oil. Further we had to test the same on the engine. This is still pending. Menwhile another student batch has taken up this project and they will continue the work.

If you are interested, I can send you a copy of the thesis work done by our students in my next mail.

Currently we are also involved in the below mentioned student projects:

We have installed a 75 kW , bio-mass gasifier plant at our institute. This can supply electric power to institute using renewable energy source with Raw material being: co-conut shell, waste wood, agro residue etc, the following projects are offered on gassifier:

- 1) Performance study on 75KW biomass- gasifier plant at N.I.E., Mysore.
- 2) Designing and fabricating- coconut shell crusher a cleaner, stirrer, wood cutting machine for biomass requirements of gassifier plant.
- 3) Waste management for the gasifier plant. (charcoal recovery, water purification, cooling tower design etc).

Apart from these ,student projects are also given in the area of:

- 1) Micro hydro power generation.
  - 2) Design and fabrication of hydraulic ram.
  - 3) various types of water lifting devices( manually operated).
- and other renewable based system design.

If any one of your colleagues need information in the above areas, we are ready to interact and share.

How are things at Oldenburg. Summer term may have started and all of you may be busy with thesis work.

Did you all finish your case study?.

Convey my regards to Dr. Blum, Hans, Heine- mann, Udo, Rajendra Singh, Andrea, and all other faculty members.

Regarding irrigation as topic for your thesis. I thing it is a good one. On manually operated water lifting device , you can go through our CART, web site: <<http://www.oneworld.org/cart>> and I can also send you more."

<[sham\\_india@yahoo.com](mailto:sham_india@yahoo.com)>

**Wisdom Ahiataku-Togobo (Ghana-PPRE96/97)** wrote us in Mai: "Good

news! I got a job at the Energy Commission (better salary) but have been called back to the Ministry on secondment. This means I will still continue to work in the Ministry but paid the salary entitled me at the Energy Commission. The Ministry will not want to release me now. I am pressed down with a lot of work and responsibilities."

And recently he wrote: "I have now been promoted to head the renewable energy department of the Ministry thus adding more responsibilities to my already tight time. It is therefore doubtful if I could make it to Germany this month as promised."

<[wisdom@NETAFRIQUE.COM](mailto:wisdom@NETAFRIQUE.COM)>

**John Muiruri Kimani (Kenya-PPRE89/90)** together with Stephen Karekezi of AFREPREN/FWD organised a one-day event related to the World Summit on Sustainable Development (WSSD) on 26th August 2002, sponsored by the African Energy Policy Research Network (AFREPREN/FWD) in conjunction with the Department of Minerals and Energy (DME), South Africa. The AFREPREN/DME event brought together key energy policy makers, experts, researchers, NGO representatives and private sector representatives from various African countries. The main focus was on improving energy services for the poor in Africa.

**Al-Mas Sendegeya (Uganda-PPRE99/00)** informed us that besides teaching at Kyambogo University, he also teaches at Makerere University (Faculty of Technology) as a part-time lecturer, now working with Mr. Patrick Mugisha (PPRE 91/92). Just recently Al-mas started his PhD-Studies Makerere University together with a Swedish University. He wrote about his PhD project: "Please I wish to inform you that I have commenced a PhD research with

both Makerere University and another University in Sweden. I will be very grateful to co-operate with the PPRE group at Oldenburg University as far as my research is concern. I will send you a tentative program later and request the group to fix me in their research programs. I have got full sponsorship to accomplish the research program. Travelling, up-keep and any expenses will be covered by the scholarship. I will be interested also to attend conferences and seminars in the field of Renewable Energy especially those related to Rural Electrification. If you have any idea about such seminars/workshops/conferences/Symposiums do not hesitate to contact me. By the way, the title of my PhD synopsis is 'Integration of Small Renewable Energy Sources: A Plausible Approach in Enhancing A Dynamic Rural Electrification Strategy'. In this research I focus Uganda rural areas as the case studies. The proposal was accepted by the Universities in Uganda (Makerere University) and in Sweden." and some weeks later Al-Mas continued: "Once again I am in Sweden. Currently at Stockholm Environment Institute (SEI) where I have to spend one month gathering information about my PhD research work. Expecting to go back to Uganda at the end of this month. Last month I was at Luleå University accomplishing formal registration. I am doing a sandwich research program with our university and a Swedish University. My research work is still in the field of Renewable Energy (Thanks to the Gemany government to pave way for my career, gratitude also go to Oldenburg University). Details about my research will be availed to you after final polishing."

<salmas@techmuk.ac.ug>

**Olivier Andriamahefaparany (Madagascar-PPRE93/94)** writes about his new job as rector of 'Ecole Supérieure Spécialisée du Vakinankaratra' (<www.ticino.com/usr/essva.mg>. He is

seeking cooperation in the field of eenergy. Please write him...)

<olivierdonat@hotmail.com>

**Björn Kuntze (Germany-PPRE-94/95)** who worked with Oldenburg RE developer EBV for some years now is his own boss and wrote an article about one of his activities (see page 33).

<b.kuntze@t-online.de>

**Quoc Khanh Nguyen (Vietnam-PPRE00/01)** who contributed so many jokes to the last newsletter, wrote: "I am pleased to inform you that I have finished my practical training at Overspeed and have started my Phd study at Bremer Energie Institute. The topic involves energy modeling which aims at analysing the possible contribution of renewable energy sources in the future energy supply of Vietnam." On 6th December he also gives a lecture in PPRE on 'Application of GIS for Renewable Energy Resource Assessment'.

<khanh\_2000@hotmail.com>

**Satish Gautam (Nepal-PPRE94/95)** left the Renewable Energy Development Programme in Nepal to start a Master's programme in Public Policy at University of Minnesota, US. Satish hopes that eventually this will lead to a Ph.D.

<satis\_gautam@hotmail.com>

**Wooslène Vanginé (Haiti-PPRE-97/98)** applied and got a permanent job as engineer in a big German company in Mannheim, Germany, in April this year. She promised to sent us more details about her job and the company in due course.

<vangine@yahoo.com >

**Konrad Lustig (Germany–PPRE-97/98)** writes from Australia, where he was spending some time at The University of South Australia, Adelaide.

<konti@ise.fhg.de>

**Ernest Mazimpaka (Rwanda–PPRE01/02)** soon after returning home writes: "I am appointed as head of a new department of environmental physics! I have to conceive the programme as a specialist from Oldenburg. It is very difficult for me but I think that with your help I will manage to do it. Every things are OK, I have been to represent my University in Ivory Cost and we met there the small rebellion but no problem."

<emazimpaka@yahoo.fr>

**Zhang Yin (China–PPRE97/98)** is still working at Dept. of Math & Physics, Shandong Institute of Education, Shandong, CHINA, although his situation has a little bit changed recently. He finished the first year of PhD study with two more years to go. His major is material science. He hopes to get the chance to do something in renewable energy especially in the field of solar cells in the future.

<zhangy@sde.edu.cn>

**Oo Abdul Rosyid (Indonesia–PPRE95/96)** reacts also to the Newsletter 1/2002: "Dear K. Blum and the PPRE Alumni,

First of all I would like to thanks to Dr. K. Blum, Mr. Edu, and the PPRE group for sending me the Newsletter 1/2002. Even I have read it from pdf files, but I like very much to read it again, again. It is a nice information for us to keep closer contact with the PPRE members as well as with the PPRE alumni.

A few month after returned from Germany in July 2001, I participated in another

Seminar events of the SURED III - Alumni Network SE-ASIA and China, in HANOI - Vietnam, on 1-5 October 2001. The detail information concerning the seminar can be reach at the sured webpage, [www.sured.de](http://www.sured.de) or directly to the Sured Newsletter, at <http://www.sured.de/suredIII/bericht.pdf>.

Unfortunately, I missed the SURED IV in Bandung-Indonesia, on 11-15 March 2002, because at that time I have already back to Germany. If some of you (especially PPRE alumni from the regions of South East Asia + China) might be interested in participating in the next SURED V Seminar (16-21 September 2002) in Beijing/China, please look at <<http://www.sured.de/newsletter/BeijingProgram0102.doc>>."

Some weeks later he wrote us more: "how are you all? I hope you are fines and enjoy your life in the winter time. I think that the rains, strong wind, and the unpredictable weather are still alive in Oldenburg. In this occasion I would like to give some news about my life which might be useful for the Newsletter.

After visiting the PPRE in May-July 2001 sponsored by DAAD through re-invitation program, now I have come back to Germany for PhD study. My PhD research has been started since February 2002 on the subject of 'Hydrogen as an Energy Carrier'. To support my life, I work as a scientific co-worker in the Uni-Magdeburg. I work for the Institute of Process Equipment and Environmental Technology, Department of Process Design and Safety. I involved in the Master Programme of Quality-Safety-and-Environment (QSE) as an assistent of Professor Hauptmanns (as my supervisor) in giving tutorials for his lectures. I am so happy because in this time period my family (include with 2 children) could stay together with me here in Germany. They would like very much to visit you all in Oldenburg. I planned to visit Oldenburg in last September 2002 together with Mr. Chayun Budiono. Unfortunately, in this time I was still bussy with my job, especially in guiding Master thesis of

the QSE students. I hope in the near future I can realize this plan.

In order to make more variation in my life, I involve in some seminars which is mainly carried out in Germany and Europe. In this occasions, I send you a picture from the Seminar on 'Empowerment of Indonesian Small and Medium Enterprises through Environment Oriented Technologies' , 4 - 6 October 2002, at The Production Technology Centre (PTZ) Berlin, Germany. The seminar was sponsored by DAAD, Siemens, and Garuda Indonesia. Unfortunately this picture is too small, because all participants should be parts of the picture. In the seminar, I presented my paper entitled 'Hydrogen as an Alternative Fuel for Transportation Systems'. It contained my feasibility study concerning hydrogen infrastructures and its application in transportation system.

<rosyid\_id@yahoo.com>

### **Alemu Tadesse (Ethiopia-PPRE-99/00)**

writes about his new assignment: "I am doing something very exciting over here. I am using the knowledge I obtained from Oldenburg. The solar energy lectures (and the simulation programmes we used in the lab) and wind energy lectures were very helpful. Now, I am working on a NASA project in collaboration with the University of Connecticut. In the mean time I am also doing my PhD in civil engineering but with the emphasis to hydrological remote sensing. The projects I am working on is an extension of what I did in England for my practical training (flood forecasting). But, here we use radar data to do rainfall estimation. We use the result for hydrological modelling. It is really an exciting work.

By the way I have got my green card for the US. That was a great thing for me. How are you doing? I hope I will visit my professors and my campus one day. All my successes are because of the first step in Oldenburg. I



Figure 2.3: 'Neue Messe' in Munich

made the best use of my stay in Oldenburg. That was great! I thank everybody and I thank DAAD always. It will remain with me FOREVER."

<alemu\_t@yahoo.com>

### **Thomas Schwarz (Germany-PPRE89/90)**

is working since more than a year now as consultant and project engineer at 'Phönix Sonnenstrom AG' company. They are planning and installing big PV-Projects in the range of >50 kW<sub>p</sub>. Their latest big project was the 1 MW PV plant at 'Neue Messe' in Munich. The picture in figure 2.3 shows only a part of the overall project, which for some time was the biggest 'On-roof' PV application world-wide. The commissioning of the project is planned for November 2002. The overall operator is 'Phönix Sonnenstrom AG', who is selling shares to private investors. An interest rate of approx. 5% per annum is calculated. So everybody interested please contact Thomas. Since his company are going to open a new branch in Hamburg, Thomas might have the chance to visit us in Oldenburg more often.

<Schwarz@sonnenstromag.de>

**Enhbold Ulziisuren (Mongolia-PPRE00/01)** reported recently that he is now working with a company (Energy Department, MCS International Co.Ltd, Ulaanbaatar) that imports and installs RE technology in Mongolia.

<enhbold@mcs.mn>

**Chayun Budiono (Indonesia-PPRE92/93)** – In September 2002 Chayun has been on a short business trip on behalf of his company in Indonesia to visit several project partners in Germany, Netherlands and Switzerland. Of course he made it also to Oldenburg for some hours to have discussions and exchange experiences with the PPRE staff and some of the present students.

<chayun@indo.net.id>

**Mirolad Nicolic (Germany-PPRE 95/96)** is about to finish his Master studies in classical archeology at the Dept. of Greek and Roman Studies at The University of Calgary, Canada. He is now looking forward to his PhD - studies in the same field.

<mnikolic@ucalgary.ca>

**Mohamed Ali Hamid (Sudan-PPRE92/93)** as mentioned earlier, left ERI (Energy Research Institute) Khartoum, Sudan and is working now with a private company dealing with power systems including PV. Actually he was planning to visit us in Oldenburg together with Dr. Hassan Wardi who is now working as the Project manager for GEF PV Project in Sudan.

<adarub@hotmail.com>

**Cesar Rivasplata (Peru-PPRE-88/89)** wrote: (Gracias por el envio de este interesante boletin,y por recibir noticias tuyas, Por Peru impulsando el desarrollo de

las ER, en diferentes frentes. Actualmente sigo trbajando en la Universidad Jorge Basadre Grohmann de Tacna y a la vez estoy desempeñandome como Director Regional de Energia y Minas de Tacna. Al respecto venimos trabajando un desarrollo en el campo de la Electrificacion Rural asi como aspectos relacionados con cocinas solares y bioclimatizacion de casas para zonas alto andinas. Te estare despues enviando algunas fotos con el fin de que aparezcan en el proximo boletin, asi sabran el resto de mis amigos que aun sigo en el frente de las ER.

.....which means that Cesar still working at Tacna University,Peru, in the field of RE and at the same time he became the Director of Energy and Mines of Tacna. They are working in rural electrification projects, dealing with some aspects of solar cooking and bi-climatization for rural houses at high altitudes. Additionally Cesar promised to send some photos to fix maybe in the next newsletter.

<crivasplata@hotmail.com>

**Melis Teka (Ethiopia-PPRE94/95)** was attending an international short term programme in the Netherlands from October to November 2002. The course was on "Energy Management and Cleaner Production in Small and Medium Scale Industries". The course objectives were to assist the participants with identification of general problems and potentials in Small and Medium Scale Industries (SMI), understanding the role of energy in production process in relation to financial viability and environmental effects, improving management skills, understanding energy and environment saving technologies, understanding the potential of recycling waste materials, preparation and execution of energy audits, understanding the role of energy in energy production, understanding international energy policies. The participants were from utilities, power generation units, NGOs, environmental institutes, consulting firms –

18 from developing countries (Africa, Asia, Latin America) and two from the Netherlands. The course was given for the duration of five weeks and was organised jointly by Maastricht School of Management and University of Twente. Two weeks they spent at Maastricht School of Management and three weeks at University of Twente. In the University of Twente the Technology Development Group was responsible to run this program. The course was organised in a way presenting case studies of his or her own working situation at home and discuss with the participants. Site visits were also arranged to industries. Moreover, case studies were discussed. The financial implication of choosing energy options were treated in the course. Moreover, the course helps to gain experience of other countries through the course participants

During his stay Melis was re-invited to do a presentation about his work and experience from Ethiopia in PPRE, but unfortunately could not come due to visa-problems.

<tekamelis@hotmail.com>

**Hancox Wilson Jaoko (Kenya-PPRE98/99)** is working as Director of the Renewable Energy Program in the Ministry of Energy in Kenya. His duties are: Energy and Environmental Policy formulation, analysis of emerging issues within the energy sector, planning and design of Renewable Energy projects. He also develops proposals for local and international financing, and works as a member of inter-ministerial Energy Project Evaluation committee. He reported about his work: "I have been so busy with a number of projects. One of them is that we are developing a computer based wind Atlas for Kenya. Also, I have been involved with a consultancy service for policy reform for urban infrastructure providers and finishing off the Solar PV quality Standards and specifications study for Kenya.

I would wish to be re-invited to Oldenburg

early next year to present some discussions on renewable energy systems, particularly on quality standards and policy issues.

During this time, I would also wish to explore with the help of the Energielabor staff explore the feasibility of establishing a research and testing center in Kenya.

This visit will also help me make contacts with organisations and institutions that produce equipment that can be used in renewable energy research and testing facility which we intend to establish in Kenya with the support from the world Bank. I am made to understand that Germany together with the US are leaders in this area."<sup>3</sup>

<hansjaoko@yahoo.com>

**Asliddin Komilov (Uzbekistan-PPRE01/02)** writes in May: "There is a new country open for development activities, Afghanistan. But I am sure that most of the people would like to learn the situation there from distance. This is the last news: 'The office of ECOSAN, the Uzbek organization for protecting the environment, was opened at a ceremony in Mazar-e Sharif, capital of the northern Afghan Balkh Province, on April 28.' You know I have a contact with ECOSAN, so I could help interested parties to establish contact and get some information or do something together."

<asliddin.komilov@mail.uni-oldenburg.de>

**Udayan Pandya (India-PPRE92/93)** sends us a short mail: "I have moved to Delhi and joined yesterday DFID supported Sexual Health Resource Centre as technical officer. Our unit is designed to provide technical support initially five States of India in the area of HIV/AIDS. As you know I have been involved with DFID's project in Gujarat for managing and supporting targeted inter-

<sup>3</sup>Hans' re-inviation is now being processed and we expect him in Oldenburg in Summer 23003

ventions being implemented by partner NGOs (mostly) with vulnerable groups such as commercial sex workers, truckers etc.

rest is fine.

With regards,

Udayan.

<mailto:mail2udayan\_in\_india@rediffmail.com>

**Oliver Risse (Germany-PPRE-00/01)** is still responsible for big PV (grid coupled) projects in Southern Germany. The newest, a 4 MW site near Regensburg (a former military area) will be connected to the grid by the end of 2002.

<olr@suntechnics.de>



<<http://www.suntechnics.com/>>

**Godofredo Magpoc Jr. (Philippines-PPRE95/96)** <gb-magpoc@NAPOCOR.COM.PH>

**Konrad Lustig (Germany-PPRE-97/98)** who started his PhD-research at the Fraunhofer Institut of Solar Energy Research in Freiburg right after his studies at PPRE in Oldenburg, did successfully pass his final PhD-Presentation and Examination on 3 July 2002 and concluded with an excellent mark!! WELL done and Congratulations!!! After his successful PhD Konrad took off for a long trip to Australia.

<konti@ise.fhg.de>

**Loukas Pilalas (Greece-PPRE-01/02)** right after his return from Oldenburg, Loukas got a temporarily job in a small RE firm called Energotechniki for 3 month before he has to join the army end of February next year. In November Loukas will attend a conference on the latest advancements on RE in Greece at the University of Patras.

<darkblue@lycos.com>

**Anand Shukla (India-PPRE01/02)** wrote immediately after returning home: "I have a feeling that I am writing this mail from another world. Already started missing all of you just after two days. Everyone in my family are intended to wishes all of you (You, Edu, Dr Heinemann, Michael Globa, Hans Holtorf). No one initially believed that anyone could come up with a publication like ours in this short period. But I am feeding them with my words and now they have to/are believing me because publication is in front of them." He joined his department in TERI (Tata Energy Research Institute) right after his Oldenburg PPRE studies. Anand is now busy with proposal writing, project execution, field trips and report writing, those things which never let anyone free at any time. After coming back to TERI he mentioned, it has not taken even a single day in adjusting to local habits.

<anand\_s72@hotmail.com>

**Raul Niño(Venezuela-PPRE00/01)** is still working in the Netherlands and offers advice concerning ECN wind energy trainings: "I am open for any question you should have regarding the wind course at ECN.

First I strongly advise you to read the information available on the internet which is very clear and complete at

<http://www.ecn.nl/>

and more specifically at [http://www.ecn.nl/wind/products/training/-12thcourse\\_IWE.html](http://www.ecn.nl/wind/products/training/-12thcourse_IWE.html)

If you still have some doubts please do not hesitate in contact me.

<raul\_nino@hotmail.com>

**Ram P. Ghimire(Nepal-PPRE-00/01)** was visited by Oliver Risse and writes: "My Best wishes for all the PPRE group. Yes, Oli and I along with my family had a nice time here together. Also I visited Bangladesh and met with Mazhar and his family. Mazhar and myself were in a same seminar on energy efficiency." Ghimire now works with Water and Energy Commission, Kathmandu, Nepal.

<rnksghimire@hotmail.com>

**Thomas Jackson (USA-PPRE-96/97)** spent some years in Portugal, and writes: "Summer greetings from Portugal. Things are progressing here, even though slower than we hoped.

We're thinking of returning to the States when things are settled here. I'm eyeing Portland, Oregon, because it's a progressive city (for the States anyway) and has job opportunities for me, and I think lots of things (natural health courses, classes etc.) to interest Cati too. Maybe even some bike paths so we could just ride around like in Oldenburg! We miss that. Vestas is opening up a large factory in Portland, and I'd like to get my foot in the door somehow. Even if the first job isn't that special, they offer training for more interesting jobs. Wind is just coming of age, and has a long, interesting future ahead of it. That would be great for us. I'll keep you informed of any progress."

Thomas also gave us some ideas about the Energielabor wind turbine: "I was just going through "Wind Energy Explained" [Manwell et al, 2002] and I came across something that reminded me of the problems you had with the wind turbine there at the university. While I was aware that dirt, dust and pollen etc. could accumulate on the blades and lower

efficiency, I hadn't realized how serious this effect was. Kind of like a shadow on a PV panel! Designers began to realize that a better understanding of airfoil stall performance was important....Leading edge roughness affected rotor performance. For example, with early airfoil designs, when the blades accumulate insects and dirt along te leading edge, power output can drop as much as 40% of its clean value. Even the LS(1) MOD airfoils, which were designed to tolerate surface roughness, experienced a loss of power in the field once blades became soiled. One of the most used codes in wind energy engineering was developed by Eppler and Somers (1980). This code combines a variety of techniques to optimize boundary layer characteristics and airfoil shapes to achieve specified performane criteria. Using the Eppler code, researchers at the National Renewable Energy Laboratory (Spera, 1994) have developed 'special purpose families' of airfoils fpor three different classes of wind turbines (the SERI designated classification of airfoils). As reported by Tangler et al (1990) these S-Series airfoils have been tested on 8m long blades and have been shown to be relatively insensitive to leading edge surface roughness and contributed to increased energy production by allowing a larger rotor diameter without increased peak power. These airfoils are now used on some commercial wind turbines. These airfoils are now used on some commercial wind turbines. [Manwell et al, pp. 102-103] The only solution is frequent blade repair and cleaning or the use of airfoils that are less sensitive to surface roughness. [Manwell et al, p. 134]"

<jackson@oninet.pt>

**Gajanana Hegde (India-PPRE-96/97)** reports a move. He is now with the Centre for Renewable Energy and Sustainable Technologies Australia (CRESTA), Curtin University of Technology, Perth, Western Australia.

He writes: "I am finally here at CRESTA in

Perth and thanks for all the support during the application stage.

I will be working on a topic dealing with rapid biogas generation creating a rumen environment in the biogas digester to combine with other renewables for electricity, looking at predictive control strategies and demand side management. This is the topic as of now and my candidacy is due by November or so." Before, Gajanana was working for 3 years at IT Power, India.

<hegdeg@ece.curtin.edu.au>

**Zaccheus T. Tarh (Cameroon-PPRE89/90)** took part in the 11th African Regional Work Programme Meeting of the Johannesburg Conference, 27th February 2002. Mr. Tarh is still working with Ministry of Mines and Energy.

<zongabiang@yahoo.com>

**Carlos I. Zarate (Peru-PPRE87/88)** moved to Freiburg / Germany (with his family). He is still working as an independent consultant for renewable energy. <furtwangen88@hotmail.com>

**Ainea Kimaro (Tanzania-PPRE-88/89)** wrote in April: "Many warm greetings from Ainea, and really many thanks for all the information you keep mailing every body.

I am currently working as a lecturer, a researcher, and engineer at the Kigali Institute of Science Technology and Management - KIST. I have a one-year contract which is expiring in December. In the recent 2 years, We have made remarkable steps in the advancement of biogas plants where today a 150mcu. digester generates over 75 m<sup>3</sup> of gas daily with very simple techniques unknown before. The plants generate 2 - 3 times more biogas under given conditions. There is more information that I wish to share with the people

of Oldenburg, especially 3 months from now when another special design of bio-latrino comes to operation. I expect to contact Prof. Janssen<sup>4</sup> to whom I want to describe simple techniques we have used to realize the said results. Otherwise my address remains the same, and thank you once again,  
Ainea Kimaro"

In summer he wrote again and sent us an article about his biogas activities (see page 34).

<ainea\_2000@yahoo.com>

## LETTERS TO THE EDITORS

Dear Mr. Knagge,

I am in receipt of your wonderful News Letter of 1/2002 and wish to thank you for the same. I am sorry sending this mail delayed. Your News Letter contains quite a good amount of information of your programmes and about students who were with you and their activities. All is so subtle human necessity for enjoyable and fruitful life. You could include one page about the infrastructure and addition done time to time at your center with technical details. With best wishes. Thanking you.

Yours Sincerely

Prof.Dr.Y.C.Bhatt

Jaipur / India

<ycbhatt@recjai.ac.in>

Please have a look at <<http://www.energielabor.de>> to find the requested data and pictures.

Dear Dr. Blum,

you might have remembered me. I am Surendra Khuntia, Sr. Scientist and Head of Rural Technology Development Department of Regional Research Laboratory, (CSIR), Bhubaneswar, India. I had visited your department during the year 1989 under CSIR-

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<sup>4</sup>Prof. Sigrid Janssen, former Professor of Biotechnology at Univ. Oldenburg, long-time teacher of *Biomass Energy* in PPRE, is now President of the German section of ISES, DGS: <<http://www.dgs-solar.org>>

DADD Scientist exchange programme. I was associated with Dr. D. Heinemann, Dr. J. Schumacher, yourself, Mr. Edu Knagee and others of PPRE during my short stay in your department. I am also receiving your news letter regularly. I have remembered that you could not visit India and my Laboratory during the International Seminar organised by TERI New Delhi. In the mean time we have developed a number of useful devices and machineries to improve the quality of life of Rural people of developing countries.

My laboratory has decided to organize an international seminar next year on Appropriate technologies for Rural development of developing countries. The title is "International seminar on downsizing technology for rural development" and it will be held during 7th to 9th October 2003 at Bhubaneswar, India. This seminar aims at bring together various small scale, down-sized and traditional knowledge based sustainable technologies, as well as other improved technologies that are available in the world today for rural development, and present them in one forum before the planners, technologists, administrators, industry, and other implementing agencies for adoption & implementation. The seminar will have plenary lectures from eminent international experts in the fields apart from presentations of contributed papers. In addition there will be! exhibition of machineries and equipments, process models etc for meaningful interaction among the researchers, delegates, industries, agencies, NGO etc. The seminar will cover a wide areas, such as energy, renewable energy devices, drinking water, rural industrialization, rural transport, agriculture, watershed management, agricultural machineries, environment upgradation, health care etc. It aims at better living and employment generation in the rural sector.

The main patrons of the seminar are Dr.R. Chidhambaram, Principal Scientific Advisor to Government to India, Dr.R.L. Maselkar, Director General of Council of Scientific & Industrial Research (CSIR) & Dr.P.Singh, Di-

rector general of Indian Council of Agriculture Research (ICAR). CSIR & ICAR are the top notch research organization of Govt. Of India. The Chairman of the seminar is the Director, RRL Bhubaneswar, and myself being the Convener.

Please convey my regards to all your colleagues of PPRE.

With warm regards.

Yours Sincerely,

S. Khuntia – <[khuntias@yahoo.com](mailto:khuntias@yahoo.com)>

## NEWS FROM PPRE-L

### UK's first dung-fired power station

began production of electricity in July 2002. The pioneering £7m plant at Holsworthy in Devon will process 146,000 tonnes of slurry from 30 local farms every year. Methane gas from the fermented slurry will power the plant, Holsworthy Biogas, to produce electricity for the national grid. The process will also provide hot water for low cost heating around Holsworthy, and organic manure for farmers to use on their land. The German company behind the plant, Farmatic UK, is hoping it could be the first of a network of "green" energy plants in the UK. Managing director of Farmatic and the man behind the new plant, Jorgen Fink, from Denmark, said that it would take up to two months for the operation to reach full capacity. He said: "We are commissioning the gas engine and testing it at full capacity today, and electricity is going to be produced. I would say that the plant in Devon can actually produce enough energy to cover the whole of Holsworthy. We are planning to start power production and sell to the National grid now. What we are doing is very safe and a lot of people have shown an interest in the UK but they are waiting to see this one up and running first. We hope to build at least 100 farms in the UK."

The processed material which eventually leaves the plant, is safe for farmers to spread on their fields because it goes through a pas-

teurisation process to remove the risk of disease.

Dung-fuelled power stations are popular in Germany and Denmark, with each operating about 20 large-scale plants.

submitted by *Mazharul Islam*

### **Building a Global Village Energy Partnership – GVEP**

The Global Village Energy Partnership (GVEP) seeks to reduce poverty and enhance economic and social development through the accelerated provision of modern energy services to those unserved or underserved. GVEP brings together developing and industrialized country governments, public and private organizations, multilateral institutions, consumers and other stakeholders in a 10-year "implementation based" program to:

Catalyze country commitments to village power projects and programs and to guide policies and investment in this area.

Bridge the gap between investors, entrepreneurs and customers in the design, installation and operation of replicable energy-poverty projects.

Serve as marketplace for information, best practices and lessons learned on effective development and implementation of energy-poverty projects/programs.

Create and maintain an effective GVEP co-ordination mechanism amongst stakeholders and partners committed to addressing energy-poverty needs.

GVEP capitalizes on existing experiences and adds value to the work of the individual partners. It reaches out to non-energy organizations in the health, education, agriculture, transport or enterprise sectors, and offers a range of technology solutions to meet their needs (renewable energy, energy efficiency, modern biomass, LPG and cleaner fossil fuels). GVEP provides a means to achieve the Millennium Development Goals contained in the United Nations Millennium Declaration and the goals of Agenda 21.

Country Action Plans: to provide the 'implementation vehicle' for energy related activities set forth in National Sustainable Development Strategies, Poverty Reduction Strategy Papers or other instruments recording national development strategies.

Capacity Development: to enhance policy frameworks, entrepreneurial development, consumer organization, and credit systems aimed at expanding the number and the capabilities of enterprises operating in rural markets and increasing access to energy services. Funding Facilitation: to increase access to energy services for households and local enterprises and ensure a broader range of financial products are available at the global and local level. Globally, GVEP will work with key donors and financial institutions to modify existing programs and design new activities and lending instruments that better suit the needs of subject investors and customers. Locally, GVEP will work on education and training of local bankers, creation of local funds, strengthening of micro credit institutions, and design of consumer credit mechanisms and organizational models.

Knowledge Management and Transaction: to share information on innovative approaches, lessons learned and best practices for improved energy service delivery and provide a forum for networking among partner organizations. Knowledge activities include establishment of a GVEP website and data bases, linking to other information sources and networks, creation of innovative outreach tools to meet local entrepreneur and consumer needs, and provision of technical assistance and training, workshops and seminars on effective energy access and delivery.

Results and Impact Monitoring and Evaluation: to track energy services provided and enhance the partner accountability for tangible results.

Expected benefits are:

With increased access to modern energy services, households will gain increased incomes and jobs, and a better quality of life from

improved lighting, power, heating, and social services; communities would have more effective social services (health, education), linkages to markets (telecommunications), and enhanced opportunities for attracting enterprises and investments.

Participating country governments will experience countrywide benefits including a reduction in the poverty levels of the population; a potential increase in economic growth and employment, and possibly reduced fiscal burden from the energy sector; access to appropriate, effective and modern technologies and human capital; environmental protection, improved health and reductions in greenhouse gas emissions; potential for increased domestic and foreign investment; and enhanced energy security and independence.

Local community and civil society organizations, NGOs and entrepreneurs will benefit from training and inclusion in a network of service providers, technicians and project managers, and from increased business opportunities.

Domestic and international financial institutions will be able to expand investment portfolios.

Private sector companies will benefit from access to information, improved public sector partnerships, and expansion into new business areas (energy products, services, appliances). Multilateral and bilateral aid donors will benefit from improved access to critical information, lessons learned and enhanced effectiveness of their respective programs in all sectors.

Points of Contact:

GVEP Technical Secretariat at Energy Sector Management Assistance Program: Dominique Lallement (<dlallement@worldbank.org>); Judy Siegel (<judy@energyandsecurity.com>); Susan McDade (<susan.mcdade@undp.org>).

submitted by *Mazharul Islam*

## Request for info on animal power

Hallo friends,

I am seeking modern effective animal powered facilities for electro or other power generation. Please send me some information or manufacturer address. thanks for help

Enhbold Ulziisuren <ebdu@yahoo.com>

## Request for info on battery banks for an autonomous system

Loukas Pilalas <darkblue@LYCOS.COM> wrote:

Hello to all former and current PPRE people! I would like your opinion on a question concerning a battery bank for an autonomous system. This bank consists of 10 batteries of the same capacity which are connected as shown in the figure. The goal is to have energy input at 24V and to extract energy at 12 V. Is such a circuitry applicable? What is the flow of energy within the bank?

Kind regards,

Loukas Pilalas PPRE 2001-2002

The reply:

Hi Loukas,

You may need to add another piece of equipment- battery equaliser/DC autotransformer. Visit [www.solarconverters.com/equal1.htm](http://www.solarconverters.com/equal1.htm) to find info on a typical system.

Felix Nitz (cced) at IT Power India may be able to share his experience of using such an equaliser when connecting a 12 V Trace inverter to a 24 V battery bank.

regards

Gajanana Hegde (PPRE 96-97)  
<akh67@YAHOO.COM>

## EDUCATION

### International training course

*Sub: International training course on "Technology Selection for Small Hydropower Development" at Alternate Hydro Energy Centre (AHEC) during February 18-28, 2003 with*

*optional tour on March 1-2, 2003.*

Dear Sir,

Energy makes a substantial contribution to the well being & prosperity of our society. Hydropower is a renewable source of energy with no emission into the atmosphere but can have positive & negative effects on terrestrial and aquatic environment. But, small hydropower (SHP) projects having the advantages of short gestation period, low investment and minimum environmental effects are getting higher priority by governments of various countries.

Ministry of Non-Conventional Energy Sources (MNES), Govt. of India has accorded the priority to the development of SHP sector and since 1993, the Govt. of India has opened the SHP sector for private sector participation to further boost the development of this important renewable energy source. To exchange experience with the participants from developing and other countries having SHP potential, Alternate Hydro Energy Centre (AHEC) is organising an International course on the above aspects of SHP.

The course participants would be provided latest information on technical issues related to technology selection aspects for small hydropower development. Experts from the academic as well as industry will be invited to discuss for optimum selection of suitable technologies for civil works and the electro-mechanical equipment for small hydro projects.

The expenditure on course material, technical visits, boarding & lodging (in twin sharing non a/c room) during the course is sponsored by Ministry of Non-Conventional Energy Sources (MNES), Govt. of India. The participants are to bear/arrange the international travel expenses from their home country to Delhi International Airport and back.

We are pleased to enclose herewith information brochure for the above course. The same may kindly be circulated among the your institution/department at colleagues for their

possible participation.

Yours faithfully,

ARUN KUMAR

Head,

Alternate Hydro Energy Centre,  
Indian Institute of Technology, Roorkee  
Roorkee - 247 667

INDIA

Phone : Off.(01332) 74254, 85213

E-mail : akumafah@iitr.ernet.in

### **African Perspectives for Renewable Energy Education**

by *Francis Xavier Ochieng*

The rising importance of renewables during this century has been due to a variety of factors including: diversification of energy supplies, promotion of economic growth and environmental protection, to simple reasons of providing reliable energy source to people who have no access to grid power. On an equal strength or more, is the educational initiatives to equip a select group of people who will steer the field in terms of research, dissemination and promote general public awareness and acceptance of the same. To this end various course like the Postgraduate Programme Renewable Energy (PPRE) at Oldenburg University are continually evolving.

Increasingly Europe, America, and Australia lead the way in the development of such educational programmes, however it will be realised that due to the major impacts of seeking funding, attracting students from developed countries and the ever present international tools like Kyoto protocol , CDM and agenda 21. Some significant proportion of some to these courses tend to concentrate on renewables that are more or less technically advanced or high cost, and suited for medium to advanced developed countries. The suggestions thus offered below, seek to remind us of the need to, at times re-orient these courses with relevance to their appropriateness to Africa. Fur-

ther still, such efforts should seek to shorten the existing technology and educational imbalance in Africa-where there are very few dedicated courses on advanced levels on renewables.

An african student who plans to initiate many of the varied RETs, will of necessity be inundated by the too many or too little available organisations who may help. On the first approximation, many of such synergies will bear fruit if the other partner sees, a positive (usually economic) gain. But, for africa to develop sometimes the gain for organisations and companies in the north, may not be realisable or attractive. Consequently RETs courses should seek to enable the students form and nurture such synergies. Of first importance would be how they can develop attractive country/region specific plans for RETs development, and how it can be brought to the attention of the interested stakeholders including policy makers in influential and governmental positions.

How can one achieve a market based rural electrification? How does one deal with the issue of RETs financing in a generally poor economic region like Africa.? Such question are at times never answered. It is left to the imagination of the student to find out-by practical trial and error. The results of successful dissemination of RETs in Africa are many times given low profile in some courses. These case studies would provide a very welcoming change to the high tech advanced approach used. Further still it would give African students and even non-african ones, an approach to RETs in different environment. A more realistic one at that.

Case studies also on African RETs policies and economics could be tackled. Since the situation is not always the same as in developed nations. An example being for instance how debt relief strategies could be channeled towards RETs.

The idea behind any course is usually the first

attraction that makes or destroy the course. A course labelled as technical-should thus provide basic theory and develop most of ideas practically. However, it would be noted that for some of the courses, the theory-though important- does not really offer much in terms of practical field application. An example here will suffice. It is noted that in resource assessment of renewable e.g. measuring wind speed or solar irradiance over a time series, a data logger may become indispensable. However it is interesting again many of would be renewable energy experts may not really know how to program one. It sound simple, until one sits down to do it practically. When such students go back home, the idea is to transfer their knowledge to enable more people to benefit. But how can such capacity building be done if only a lot of theory has been ingested and not much practical work.

Generally the idea is to develop the practical work by doing lab work. However, such work may turn to be a fallacy. The aim of those experiments is to say determine the specific parameters like the characteristics of the solar module under one cell shading using a field array tester. More efforts to not understand the system, but even do repair work may be of importance in the light of capacity building. The final user and probably disseminator will not need 100% theory to repair. Crucial basics coupled with a long period of experience may be of worth.

key aspect of RETs course offered is that they attract different nationalities with different expectations. Not all of them want to learn the same kind of renewable energy source. A basic appreciation for them would be enough. Consequently modular course offers an attractive alternative.

However, a danger exist. In offering parallel or sequential modular courses, practice may be sacrificed for the sake of theory in order not to fail meeting the deadline. Further it is quite attractive to make the course online. But will african institutions be able to access them.

Thus the need to offer information and modularity has to take cognizance that linkages and synergies need be formed with african institutions to enable the benefits of the course to "trickle" down to Africa.

Unless individually pursued, little opportunities exist for african students undertaking RETs courses to present papers in seminars and fora's of significance. The course should provide information on upcoming meets and encourage students to develop concepts worthy of presenting there. If possible, due to limited opportunities for african students to access funding to attend such meetings, provision should be made for them.

Such forums provide a platform for these budding professional to aquire pose and experience in scientific reseach dissemination and more importantly bring to attention the needs of Africa as far as RETs.

As a last note, but probably not the last in terms of the reality facing Africans taking RETs courses in developed countries and of particularly of the PPRE. The need for african oriented advanced research needs looking into. In many of the available scholarship/fellowships and support, Usually Africans are excluded-probably because they are not members of the EU e.t.c And if they are lucky to get one-it is usually in some predefined research field, which may not have immediate relevance to the pressing African energy woes. A special consideration even if only one for each renewable energy course may be provided to Africans -for advanced research that has immediated relevance to Africa.

The paper has considered some suggestions at general improvement of RETs course. Such suggestion include synergesis, need for african case studies, more capacity building oriented course, aspects of information and modularity of the course structure, participants access to seminars/forums and lastly it has considered the need for provision for african oriented research.

Dilbert's Salary Theorem  
 Dilbert's "Salary Theorem" states that "Engineers and scientists can never earn as much as business executives, sales people, accountants and especially liberal arts majors." This theorem can now be supported by a mathematical equation based on the following two well known postulates:  
 Postulate 1: Knowledge is Power.  
 Postulate 2: Time is Money.  
 As every engineer knows:  $Power = Work / Time$ .  
 Since:  $Knowledge = Power$ ,  
 then  $Knowledge = Work / Time$ ,  
 and  $Time = Money$ ,  
 then  $Knowledge = Work / Money$ .  
 Solving for Money, we get:  $Money = Work / Knowledge$ .  
 Thus, as Knowledge approaches zero, money approaches infinity, regardless of the amount of work done.

In itself, the PPRE programme, being an international course cannot just cater for Africans, nor can it wholly concentrate on RETs available and applicable in developed nations. A balance should be struck between the varied nationalities gathered there. Striking such a balance is not easy, but it is also not impossible. For Africa to develop, it may have to develop its own course specifically targeting its problems. But until such a time, one has to look far outside Africa for help.

It is my conviction that forming synergesis with african educational instutions, like has already been formed in the Zimbabwe PPRE is only the first step. The second could be the tailoring of the course to the local situation there in terms of content and practicality. Such, should then be replicated in various countries.

With the advent of such courses over Africa, the need to come to learn here and the costs involved to deliver the course would significantly change. An interesting concept would for instance, be the allowing of sponsored and able students to spend a time in such sister institutions in Africa sharing their experiences, and gathering more!



## PROJECTS

### Undersizing inverters for grid connection – What is the optimum?

by *Saiful Islam, Achim Woyte, Ronnie Belmans and Johan Nijs*

**ABSTRACT ONLY**<sup>1</sup> — In grid-connected photovoltaic systems in moderate climates, the inverters usually are undersized. This is motivated by the attempt to utilise the inverter's power range as good as possible. Technically, undersizing can increase the system performance as it causes the inverter to operate as little time as possible at low partial load efficiency, without application of complex master slave configurations. Economically, undersizing leads to significantly lower balance-of-system (BOS) costs per installed kilowatt peak power. On the other hand, when the potential solar supply exceeds the inverter's power rating, only the maximum rated power can be supplied to the grid. Based on 5 second measured irradiance values for one year, the characteristic frequency distribution of ten-second average solar irradiance measurements has been determined. These data serve as a basis for the calculation of annual system performance as a function of the inverter-PV ratio. Simulations have been carried out for various up-to-date types of inverters with regard to different economic boundary conditions. Key words: Grid-Connected, Inverter, PV System

### From Wind to Biomass

by *Björn Kuntze*

In March 2002 I quitted my job at EBV, Oldenburg. I was working for this company exactly 4 1/2 years. My main tasks had been: planning of wind farm projects here in Ger-

many and managing the operation of 86 wind turbines and a 408 kW micro-hydro power plant. Besides that I was involved in project identification processes in the biogas and the woody biomass sector. Wind energy is still a very fast growing business, but for myself, I think, it became already to big. In my opinion, there is too much business, too big worldwide acting companies, too much fast money making, too little conviction, too little human reliability?

So I decided to start again from the beginning in my most favorite subject: gasification. I had good luck to find another expert in gasification, Wifried Richter, with whom I work together since April 2002. The ones of you who had joined the 94/95 session should remember him: Uli Graf managed a trip to MHB company, Fürstenwalde, where Wilfried was explaining the working 30 kW<sub>el</sub> gasifier-engine system to us. One year before, Wilfried had installed this system together with Doug Williams, Fluidyne Gasification, New Zealand. Later on, Wilfried operated that gasifier for some 1000 operating hours gaining valuable experience in gas conditioning and engine operating. In October 2002 we managed to sell our first small experimental pyrolysis reactor to a company in Berlin, which is doing a gasification research project. Originally this reactor was planned to be the first stage of our actual three stage concept, which bases on my 40 kg/h wood-chips reactor in Siegen from 1997. But, since Wilfried is working with this company, we can do some test runs over there.

Now we are planning a 200 kW<sub>el</sub> demonstration plant in Bremen. As usual, we are more busy with acquisition of funds than with engineering the plant. Also the location of the project causes some trouble, since the district heating system, where we want to feed the heat in, is also in a planning stage and its realization is not sure in the moment. If everything comes out fine, we will start with operating the plant in December 2003. Further

<sup>1</sup>full article is available as PDF file from <saiful70@yahoo.com>



Figure 5.1: Biogas plant of the authors design

on we are very interested in equipping pilot projects in the range of 100 - 1.000 kW<sub>el</sub>. For any further information, you are invited to contact me.

## Nuclear Reactor For All

by Ainea Kimaro

Nuclear fission is not my area, but biogas technology is, in the respects of planning, designing, installation, operation and maintenance of the plants, gas utilization, effluent reuse, continuous research and developments, etc. If you feed anaerobic plants with organic materials in the right proportion and under favourable conditions, you will get energy in the form of gas. You will also remain with a bio-effluent, which exists in much simpler organic forms. Where organic wastes form the feedstock, the inherent pathogens will be decimated or completely eliminated for the good of health and environmental aspects. Usually, biogas will be used for cooking and generation of motive power including electricity. It can be used too, however, as an alternative to pesticides when storing food grains like maize. The bio-effluent will be used to supply plants with nutrients and water but also, reconditioning soils for sustainable crop production. Energy and agriculture! Evolution

therefore of more effective bio-digesters, that are simple to operate and simple to maintain should be the common desire of all of us; biogas plants that have higher bio-degradation rates, and that correspondingly generate more gas per unit mass of the feedstock. It's in the above light, we began 10 years ago re-assessing and refining the main components of non-stirred fixed dome biogas plants (inlet, digester, compensating chamber & outlet), with the objective to enhance the biodegradation processes while keeping the system simple and reliable. But preliminary discussions were already there in 1989, with Prof. Joachim Luther and Prof. Sigrid Janssen during my term of study at Oldenburg. For systems feeding on animal and toilet wastes, the inlet conduits of diameter size 4"- 6" have worked well for a wide range of digester volumes up to 100m<sup>3</sup>. A series of small hemispherical digesters has generated more gas per unit feed, under same conditions, than a single hemispherical shell of same volume - perhaps owing to the plug-flow phenomenon. When the compensating chamber is placed at the inlet point, and not on the opposite direction, the results are even more exciting (see photograph in figure ). Gas production is almost doubled - compared to similar plants operating under the same conditions - and apparently so, when integrated with a series of inoculation conduits connected to compensating chambers in the direction of flow. Shifting the compensating chamber towards the inlet point does not entail further costs comparatively, by design and in practice. The exit point however, remains at the furthest point from inlet, and hence making the interaction journey of the organic wastes with the "hungry bacteria" the longest possible in the anaerobic conditions. As found in psychology, by inoculation theory, a weak shock leads into a pronounced reaction; and possibly the same phenomenon is taking place too in the biological processes. It is how the Kigali Institute of Science and Technology (KIST) has built the biogas systems at Cyangugu prison (near Lake

Kivu), for the treatment of toilet wastes and gas production; 150m<sup>3</sup> during project phase I in 2000, and 400m<sup>3</sup> as project phase II - currently under construction.

For phase I, we connected two 75m<sup>3</sup> plants, whereas the 400m<sup>3</sup> is a chain of four 100m<sup>3</sup> plants that are linked by connecting windows of size 170 x 120cm. The plants feed in series, allowing the windows to establish a common corridor where anaerobic digestion takes place as the materials propel to the outside world.

Each window is closely followed with an inoculating conduit that runs from a compensating chamber made almost aeration-free, so as to minimize the inhibitory aeration effects to the digestion process.

Basing on the present level of 75m<sup>3</sup> gas production per day, it's expected eventually to have a total of 275m<sup>3</sup> of gas per day, and reduce firewood demand at the prison substantially. Improved sanitation and benign disposal of the wastes will constitute additional benefits to the environment.

In regard to gas use, we are using injector burners because of their advantage in pre-mixing gas with air for good combustion, which nevertheless is complemented by secondary air. Without adequate primary air, the gas would naturally burn with long flames in search of air, and in so doing that would reduce heat intensity under the pot.

So, with continued developments in the biodegradation processes and use of effective appliances, will liken the biogas systems to nuclear reactors, since they will serve more people for their energy needs in varied economic conditions, and yet, retaining spin-offs, all positive to the environment. Remarks will be highly valued by the author (<ainea\_2000@yahoo.com>).

## Wind Energy Resource Assessment - Puttalam and Central Regions of Sri Lanka

by *P.L.G. Kariyawasam*, Chief Engineer (Pre-Electrification Unit), Ceylon Electricity Board  
(*This is an extract from the Final Report published by the CEB on "Wind Energy Resource Assessment - Puttalam and Central Regions of Sri Lanka" - April, 2002 Co-Authors - K.S. Fernando, Resource Management Associate (Pvt.) Ltd., Sri Lanka, P.L.G. Kariyawasam and A.M.A. Alwis, of Ceylon Electricity Board, Sri Lanka*)

**Introduction** Wind Resource Assessment and Project Preparation is a sub-project of the overall project on "Sri Lanka Capacity Building in Renewable Energy and Energy Efficiency". The project is funded by the United Nations Development Programme/Global Environment Facility and the Government of Sri Lanka. Implementation agency of the sub project is Pre Electrification Unit of Ceylon Electricity Board (CEB), which is the arm of CEB that undertakes activities related to renewable energy development. The sub-project on wind resource assessment and project preparation is expected to deliver five key outputs. This brief report concerns the output 1, which deals with the assessment of wind resources on the Puttalam and Central Regions and development of a wind map for these two regions.

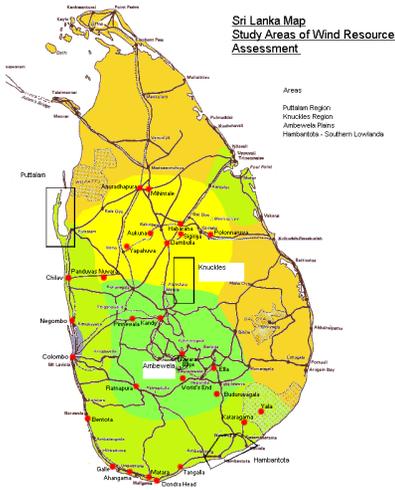
**Wind Climate in Sri Lanka** Wind climate in Sri Lanka is largely characterised by the Asian Monsoon system described earlier and could be broadly classified as:

North East (NE) Monsoon — December - February

1st Inter Monsoon — March - April

South West (SW) Monsoon — May - September

2nd Inter Monsoon — October - November



Of the two monsoon wind systems found in Sri Lanka, SW monsoon is the strongest and more persistence wind regime. It is felt across the entire country with varying degree of intensity. Regions where strong SW winds occur are the coastal belts in the south east, north west, north and the north east as well as the Central and Sabaragamuwa mountain ranges. NE winds are weaker and last during the short period of December - February. Modest NE winds are found along the coastal regions referred to earlier but they rarely reach the mountainous regions with any strength.

**General Overview of the Study Area**

Present study was undertaken to assess wind energy resources in the Kalpitiya peninsula, Knuckles Range and Ambewela Plains. Kalpitiya peninsular is generally a flat land comprising sandy tracts, low-grown vegetation and patches of coconut plantations. On the whole, the coastal strip of this region is well exposed to prevailing winds and is devoid of thick vegetation.

Although measured wind data is absent in any location in the Knuckles Range, traditional knowledge says that some parts of the mountain range do experience strong winds during

the May - September period. Besides these specific sites, several other parts in the region have natural indicators to confirm the prevalence of strong winds. Windy sites are found mostly on the leeward side of the Knuckles Range.

Ambewela is part of the High Plains (≈ 2200 m above MSL) and is characterised by flat and undulating landscape with large tracts of grasslands interspersed with gnarled trees. Previous studies by CEB and natural indicators, such as deformed vegetation, seem to indicate that the region is exposed to strong winds.

**Wind Data Collection System**

Wind measuring system used in the study comprises three cup-anemometers (# 40 maximum anemometer) installed at 10m, 20m and 40m above ground level, one wind direction sensor (# 200 P NRG wind Direction vane) mounted at 40m, and a data logger (NRG logger # 9200 plus). These are installed on a locally fabricated 40 m high mast.

All the data collected by sensors are processed into average values and stored in two removable data chips mounted on the front panel of the data logger. Averaging intervals used in the present study is 10 minutes, which is the internationally accepted averaging interval for wind data. Logged data contain the average values of the wind speed and standard deviation at each height of measurement, wind direction at 40m, and the 2-second gust recorded by the anemometer at 40m. Data collection is done by removing the data chips and downloading data through a chip reader that gives out data as xxx.a00 files. This is not a readable file and needs to be converted into xxx.n00 file format using the software supplied with the logger. Latter file type is in ASCII format and could be saved as an EXCEL file or converted into xxx.dat files to be fed into the WaSP Software.

**Wind Mast Locations** Date of commissioning and period of wind data monitoring for the present study report are listed below with the mast locations.

### **Analysis of Results obtained during the Study Period**

The seasonal wind pattern in Narakkalliya conforms to the general monsoon wind climate experienced in Sri Lanka — SW monsoon from May to October and NE monsoon from December to February. Data from 19th January 2000 to 18th January 2001 give an annual average wind speed of 7.15 m/s at the measuring height of 40m. Winds are strongest from June to August giving a mean wind speed of 10.0 m/s. On the whole, monsoon winds remain steady during both seasons giving Weibull Shape Factor (k) values of 5 for SW winds and 3 for NE winds. It should, however, be mentioned that the two distributions do not fit well with the Weibull curve. Due to the existence of two persistent wind regimes, the annual wind regime shows a slightly bimodal distribution. For the inter-monsoon winds during March/April and November, the k value works out to  $\approx 2$ .

Winds in Narakkalliya display a remarkable directional persistence. Percentage duration that winds blow from the direction sector 180-270 degrees, which is the predominant direction of SW winds, accounts for 60%, while winds blowing from 0 to 90 degrees (NE monsoon winds) accounts for 25%.

There is very little diurnal variation in the strength of winds during both monsoons. Contrasting diurnal variation (with strong daytime winds) is observed during the inter-monsoon month of March when sea-land breezes, which are driven by the local pressure gradients, dominate the wind system.

Turbulence intensity of the wind regime shows marked difference along different directions. As is to be expected, SW winds blowing over the ocean show very low tur-

bulence intensity - 0.05 - 0.1 within the sector 120-300 degrees while NE winds blowing over land along the sector 0-100 degrees record comparatively higher values of 0.2.

The wind mast in Karathivu is located on the eastern shoreline of the Puttalam lagoon. The mast was sited in this manner primarily to record SW winds blowing over the lagoon, as the lagoon could be considered a potential site for off-shore wind development in the future.

SW winds entering the land along the west coast blow over the Kalpitiya peninsula and then over the lagoon before reaching the mainland. Based on this description of the main path of SW winds in the Puttalam region it is logical to expect that during its passage over the peninsula winds would get retarded to some extent and regain its strength when blowing over the 10 km wide lagoon. However, data collected in Karathivu do not seem to support this view and show consistently lower wind speeds - almost 90% of the speed in Narakkalliya during SW monsoon and 80% during the NE monsoon. The annual wind speed frequency distribution in Karathivu is similar to Narakkalliya and displays two peaks characterising the two monsoon wind regimes.

As the wind mast in Puttalam meteo station was set up only in late September 2000, it is not possible to make any comparative analysis of wind data from the Puttalam meteo station and Narakkalliya & Karathivu which cover the year 2000 with only two weeks of data from January 2001. Therefore reference to these two stations will be made only for qualitative analysis of the wind climate.

Puttalam meteo station is situated on the eastern edge of the Puttalam town. SW winds, which enter the landmass after crossing the lagoon, blow over the town before reaching the meteo station. Thus, it is logical to expect considerable retardation of SW winds when they reach the meteo station and data indeed confirms this trend though there is a large data

| Name of Station        | Latitude   | Longitude  | Date of Commissioning | Period of available data |
|------------------------|------------|------------|-----------------------|--------------------------|
| Narakkalliya           | 80° 0.70'  | 790 43.34' | 18th January 2000     | 23 months                |
| Karathivu              | 80° 12.61' | 790 48.95' | 17th January 2000     | 23 months                |
| Puttalam Meteo station | 80° 1.64'  | 790 50.47' | 24th September 2000   | 14 months                |
| Wellammalal            | 80° 14.08' | 790 43.89' | 15th February 2000    | 6 months                 |
| Mahailluppallama       | 80° 6.71'  | 800 28.19' | 25th September 2000   | 14 months                |
| Ratminda               | 70° 32.21' | 800 45.16' | 18th October 2000     | 14 months                |
| Hare Park              | 70° 21.50' | 800 50.83' | 2nd November 2000     | 12 months                |
| Ambewela               | 60° 53.48' | 800 48.42' | 16th October 2000     | 14 months                |

scatter. Similar trend is noticed during the NE monsoon.

Wind speed frequency distribution in Puttalam bears a similar character to that in Karathivu. In common with Narakkalliya and Karathivu, Puttalam also shows a slightly bimodal annual frequency distribution. Diurnal wind pattern in Puttalam is similar to other two stations during the NE and Inter-monsoon seasons. However it shows a slight daytime peak during the SW monsoon, which was not noticeable in Narakkalliya and Karathivu.

Wind mast in Ambewela is situated in the cattle farm of the National Livestock Development Board. The farm, which lies at an elevation of about 1800 m, is characterised by an undulating landscape covered largely by grasslands. Ambewela lies on the leeward side of the 2100 m high Horton Plains.

The overall wind pattern in Ambewela follows the general monsoon wind climate in Sri Lanka, which is characterised by the SW and NE monsoons. SW winds in Ambewela are stronger than Narakkalliya on the west coast, but it appears that NE winds do not reach the high plains in Ambewela with great force. Based on data from November 2000 to October 2001, the annual wind speed in Ambewela is 7.31 m/s at the measuring height of 40 m.

Unlike in the Puttalam region, Ambewela shows great variation in wind speeds during both monsoons resulting in a comparatively lower Weibull shape factor:  $k = 2$ . However, the frequency distributions do not fit well with the Weibull curve. Perhaps data collected over longer term might give a better fit.

In terms of direction, winds in Ambewela show a remarkable degree of persistence – 52% of the time winds blow from a narrow direction band of 240-270 degrees during SW monsoon and 28% from the 30-60 degree sector during NE monsoon.

There is very little diurnal variation in the strength of SW winds in Ambewela except the slight drop in wind speed around mid afternoon. During other seasons a marked daytime peak is discernible.

Turbulence intensity in Ambewela is about 0.1 during SW monsoon, i.e. corresponding to the direction sector  $\pm 240$  degrees, while it varies from 0.1 to 0.15 along the 50-100 degree sector.

Although the mean annual wind speed in Ambewela is higher than in Narakkalliya, due to the lower air density ( $\approx 1 \text{ kg/m}^3$ ) at the high elevation of Ambewela, available power in the wind would be about 15% less as compared to sea level.

Wind mast in Mahailluppallama (MI) is located in the agro-meteorology station of the Central Agricultural Research Station. Mahailluppallama is situated in the dry zone where intensive rainfall is experienced only during the short period of November - January. The general landscape is characterised by extensive flat and moderately open terrain interspersed with clusters of thick vegetation.

Wind regime in Mahailluppallama follows the general monsoon wind climate - SW winds from May to September and NE winds from December to February. Winds blow from the direction sector 180° - 270° (SW winds) for

53% of the time while NE winds blowing from 30° - 90° account for 20% of the time.

The diurnal wind pattern in Mahailluppallama is marked by stronger daytime winds and weak night-time winds during all seasons.

On the whole, the wind regime in Mahailluppallama is much very weaker than those prevalent in the Puttalam region and Ambewela and does not offer the potential for harnessing wind for wind electricity generation. Modest winds, which prevail during the SW monsoon in this region, might offer the potential to use small wind pumps for irrigation purposes.

## CONFERENCES

From 14<sup>th</sup>-19<sup>th</sup> June 2003 the next ISES World Congress will take place in Gothenburg / Sweden. See <http://www.ises.org> for details.

In the educational session on Sunday, 15<sup>th</sup> June, you will find two papers/presentations by PPRE staff and at least one from alumni.

## RENEWABLE ENERGY JOBS

**Technical Wind Specialist** Technical Wind Specialist with at least 2-3 years experience required for leading Energy group currently expanding its wind energy team. The position will involve project management and reporting, resource assessment, design and technical analysis, and will require good communication skills. The applicant will preferably have experience of resource assessment, design and project commissioning.

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## PPRE THESIS TITLES 2002

Please find below the titles of the theses submitted in PPRE 01/02 (in brackets the names the supervisors). If you want to receive an abstract, please send e-mail to [kblum@uni-oldenburg.de](mailto:kblum@uni-oldenburg.de).

*Bahy Saad Abdalla Abd El Mesih*—Utilisation of Solar Energy in Remote Areas (Dr. K. Blum, Dr. D. Heinemann)

*Jordi Avellaneda de la Calle*—Sensitivity Analysis with State-of-the-Art Energy Scenario Models for Africa (Dr. D. Heinemann, Dr. K. Blum)

*Vivian Ebote Belle*—Increasing the Yield of Biogas from Biomass and its Application for Energy Production (Dr. K. Blum, Prof. Dr. R. Lohmüller)

*Ram Prasad Dhital*—Financial Sustainability of Micro-Hydro Power Plants in Hilly Region A Study of Nayagaun / Nepal (Prof. Dr. W. Pfaffenberger, Dr. K. Blum)

*Butchaiah Gadde*—A Concept for the Economic Utilisation of Biogas as a Renewable Fuel for Fuel Cells (Dr. K. Blum, Prof. Dr. W. Pfaffenberger)

*Bora Heang*—Small PV Systems for Rural Electrification in Cambodia (Dr. K. Blum, Dr. D. Heinemann)

*Asliddin Gulomovich Komilov*—Temperature Dependence of Organic Solar Cell Parameters (Dr. V. Dyakonov, Dr. J. Schumacher)

*Thomas Frank Manssen*—Economic and Ecological Importance of Purified Biogas Feeding into the Public Gas Supply Systems in Comparison with Other Energetic Uses of Biogas (Dr. K. Blum, Dr. D. Heinemann)

*Mazimpaka Ernest*—Solar Home System Integration in Rural Area Case of SSD-EN-SA in Mali (Dr. K. Blum, Dr. D. Heinemann)

*Ibrahim Ahmad Shafi Al Mohtad*—Numerical

and Experimental Photoluminescence Studies of a-Si:H/ c-Si Heterodiodes (Prof. Dr. G.H. Bauer, Dr. K. Blum)

*Henry Nota Nanji*—A Methodical Approach for the Development and Planning of Micro-Hydro Schemes for Rural Electrification (Dr. K. Blum, Dr. D. Heinemann)

*Francis Xavier Ochieng*—A Correction Scheme for Silicon Solar Cell Irradiance Sensors (Dr. D. Heinemann, Dr. K. Blum)

*Loukas Pilalas*—Description and quantification of uncertainties in the wind energy yield calculation on base of the European Wind Atlas methods (Dr. D. Heinemann, Dr. K. Blum)

*Om Prasad Poudel*—Micro- and Pico-Hydro Power for Rural Electrification in Nepal Options, Opportunities and Challenges for Sustainable Energy Development (Dr. K. Blum, Dr. D. Heinemann)

*Santiago Sánchez Miño*—Introduction of Distributed Electricity Generation in Developing Countries: A Proposal for Ecuador (Prof. Dr. W. Pfaffenberger, Dr. D. Heinemann)

*Sayed Faruque Shah*—Sustainable Development through Renewable Energy in Rural Area of Bangladesh (Prof. Dr. W. Pfaffenberger, Dr. K. Blum)

*Anand Shukla*—Irrigation in India: Energy Efficiency and Scope of Alternative Fuels & Technologies (Dr. D. Heinemann, Dr. K. Blum)

*Panagiotis Triantafyllos*—Wind Potential and Energy Calculation (Dr. H.P. Waldl, Dr. K. Blum)

*Alejandro Umaña Echavarrá*—Modelling of Wakes in Offshore Wind Farms - A Comparison of Current Models with Data from the Vindeby Wind Farm (Dr. D. Heinemann, Dr. Wolfgang Schlez)

## WEB SITES OF INTEREST

**Power to the People** The ITDG Seminar Report "Power to the People: Sus-

tainable Energy for the World's Poor" can be downloaded from the ITDG website at <[http://www.itdg.org/html/advocacy/docs/p2p\\_report.pdf](http://www.itdg.org/html/advocacy/docs/p2p_report.pdf)>

(submitted and recommended by Mazharul Islam)

**IISD Linkages** A very useful multimedia resource for environmental and development policy makers can be found at <<http://www.iisd.ca>>.

**AFREPREN Newsletter** Attached kindly find the May, 2002 issue of the African Energy Policy Research Network (AFREPREN/FWD) Newsletter. The Newsletter is in Microsoft Word 97 (filename: Newsletter.doc) and it includes the following items:

1. Modern Energy Use and the Urban Poor in Ethiopia
2. The Socio-Economic Impact of Geothermal Energy Development on the Poor in Kenya
3. AFREPREN Training Course on Proposal Preparation & Presentation
4. AFREPREN National Policy Seminars
5. New Publications
6. Regional Energy News
7. Energy Events Agenda

Please note that an electronic version of the above Newsletter can be downloaded from the following web page: <<http://www.afrepren.org>>

Warmest regards,  
Stephen Karekezi, Director,  
AFREPREN/FWD

**BP Statistical Review of World Energy 2002** BP released its annual statistical review of world energy in June. According to BP, the world has at least 40 years of oil supply left and 60 years of natural gas. While noting that new forms of energy will eventually come along, BP maintains

that oil and gas will remain the predominant fuels for at least the next 30 years.

If 30 years doesn't sound like long to you, perhaps you should peruse the company's renewable energy section. According to BP, installed wind power generation capacity has increased more than ten-fold over the last decade, to 25 gigawatts. "For the last three years, wind power capacity additions have exceeded those of nuclear power," says BP, "signaling wind's emergence as a mainstream energy source."

Installed solar electric capacity has increased more than ten fold over the last decade, but from a low starting point. BP estimates just over 0.7 gigawatts of solar electric capacity installed worldwide in 2000, but that represents a 37 percent increase over the previous year's capacity. Geothermal capacity is nearly 6 gigawatts worldwide, and has grown about 37 percent over the past ten years. And hydroelectric power production increased just 16 percent in the past decade (although China aims to remedy that soon).

BP presents one of the most comprehensive views of world energy production and use by drawing on worldwide information sources, and with its 2002 issue, the publication reaches its 51st annual edition. See the BP press release at: [http://www.bp.com/centres/press/p\\_r\\_detail.asp?id=904](http://www.bp.com/centres/press/p_r_detail.asp?id=904).

See the BP Statistical Review of World Energy 2002 at: <http://www.bp.com/centres/energy2002/>.

And last but not least, be sure to see the Renewable Energy page (and note the left-column links to solar and wind information!) at: <http://www.bp.com/centres/energy2002/renewables/index.asp>.

*(submitted by Mazharul Islam)*

**Renewable energy project analysis software** RETScreen is a pre-feasibility software package, which enables users to assess energy production, costs and financial vi-

ability of renewable energy projects anywhere in the world.

The package currently provides for evaluation of eight renewable energy technologies through a series of modules, which run within the main Excel-based program. The PV-specific module can assist with technical and economic analyses of grid-connected projects, ranging from centralized plants to smaller-scale distributed applications. The tool can also be used to determine radiation data in the plane of the array based on known horizontal insolation data.

The latest version of the software incorporates a link to NASA's Solar Energy Data Website to allow retrieval of insolation and near-surface air temperature data for any location world-wide. An integrated on-line database of renewable energy products provides information such as product specifications and performance data on equipment that may be used in the project, enabling comparison of alternative components.

The program, which is the work of Canada's CANMET Energy Diversification Research Laboratory (CEDRL) with input from many international renewable energy experts, can be downloaded free of charge from <http://www.retscreen.gc.ca>.

## **World Wind Energy Association**

The WWEA promotes the use of wind energy worldwide through its efforts to improve communication among the wind energy industry, influence national and international policies, and provide avenues for international technology transfer. Its activities include sponsoring the World Wind Energy Conference and Exhibition, which was held in Berlin in early July. A short manifesto, "A Global Strategy for Wind Energy," was released during the conference and is available on the Web site. <http://www.wwindea.org/default.htm>

*(submitted by Mazharul Islam)*

**Asian Energy News** have a New Home (<http://aen.ceerd.net/#editorial>) The Center for Energy-Environment Research & Development (CEERD) has moved to a new home. To ensure that CEERD will continue to achieve its goals and realize its new vision, it has affiliated with the Foundation for International Human Resource Development (FIHRD), a Thai foundation with an international orientation.

NEWS IN BRIEF / AT A GLANCE .

(<http://aen.ceerd.net/#news>)

a. ASIA: Transport, Environment Declaration Adopted in Tokyo

([http://aen.ceerd.net/aen\\_0102b.html#ASIA](http://aen.ceerd.net/aen_0102b.html#ASIA))

b. BHUTAN: Basochu Upper Stage Inaugurated

([http://aen.ceerd.net/aen\\_0102b.html#BHUTAN](http://aen.ceerd.net/aen_0102b.html#BHUTAN))

c. INDIA: IDBI Invites Bids for Enron's India Plant

([http://aen.ceerd.net/aen\\_0102b.html#INDIA](http://aen.ceerd.net/aen_0102b.html#INDIA))

d. INDONESIA: Approval of New Power Law Seen in March

([http://aen.ceerd.net/aen\\_0102b.html#INDONESIA](http://aen.ceerd.net/aen_0102b.html#INDONESIA))

e. NEPAL: IPC'S Technical Bid Approved

([http://aen.ceerd.net/aen\\_0102b.html#NEPAL](http://aen.ceerd.net/aen_0102b.html#NEPAL))

g. PAKISTAN: Nine Oil, Gas Fields Up for Bids on April 15

([http://aen.ceerd.net/aen\\_0102b.html#PAKISTAN](http://aen.ceerd.net/aen_0102b.html#PAKISTAN))

h. SOUTH KOREA: MOCIE to Finalize Power Industry Privatization Plan

i. TAIWAN: Government Lets Foreign Investors Own Power Plants ([http://aen.ceerd.net/aen\\_0102b.html#TAIWAN](http://aen.ceerd.net/aen_0102b.html#TAIWAN))

EU ENERGY, ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

[http://aen.ceerd.net/#EU\\_EESD](http://aen.ceerd.net/#EU_EESD)

### **Energy for Sustainable Development**

Editors: Thomas B. Johansson and José Goldemberg

*Energy for Sustainable Development: A Policy Agenda* discusses critical energy policies, illustrated with concrete examples, necessary to address multiple development objectives, including economic growth, equity and environmental protection. The purpose of the publication is to follow-up on the 2000 report *World Energy Assessment: Energy and the Challenge of Sustainability*, a collaborative work to which more than 100 scientists and development experts contributed, and to offer informed guidance on how to shape public policy so that it accelerates the growth of energy systems that support sustainable development.

As the publication describes, policy makers are struggling to understand how to intervene most effectively to stimulate technological innovation, attract private investment, and refocus regulation to advance the economic, social, and environmental objectives of sustainability. Regrettably, there are no simple blueprints that will work in all situations, but experience over the last several decades has provided valuable insights and it is possible to extract many lessons that can be instructive to policy makers. Case studies throughout the volume provide examples of what has succeeded, and more often, what has failed, and why.

The document can be downloaded from <http://www.undp.org/seed/eap/html/publications/2002/20013108FNRapport.pdf>

### **Centre of applied research "sustainable energy technology NET" Baden-Württemberg**

The goal of the research alliance Sustainable Energy Technology (NET=Nachhaltige Energietechnik) is to combine and focus available skills from the universities of applied science and research institutes of Baden-Württemberg and to develop and to make available user-friendly, integrated energy concepts for buildings and regions in order to make economic and energy-

efficient solutions possible. The structure of the Centre for applied research NET is comprehensive, including five universities of applied science, inter-disciplinary and international. NET carries out application-oriented research on new technologies in year-round solar energy use for cooling, heating and electricity production as well as integrated energy management and information systems within buildings. The whole project is divided into five work packages that are to be dealt with over a period of three years. In the first package, an overall concept for sustained building climate control and the information technology within a building are to be developed as well as specifying the testing installation to be set up in the College of Technology at the University of Applied Science in Biberach. In the second step, all partial projects of the individual partners in system technology, building information, controlling and simulation are to be developed conceptually and documented. The demands of building technology as well as concepts for solutions towards a year-round, effective, low-energy concept will be summarized at the end of the first project year in a conceptual study. Initially, the concept study will include - as a function of the building type (with living and administrative building types being treated individually) - the energy-related demands for new and already existing buildings within German and Southern European climatic conditions. In the second part of the study, strategies for the year-round fulfilling of energy needs will be documented. In work package three, concrete development of components and software solutions are to be carried out within the first two years of the project: the development of components for solar thermic cooling will be under the overall control of the University of Applied Science in Stuttgart.

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**Electricity Systems Analysis**

Adica Consulting has recently finalized agreements through which we can offer an impressive suite of software products, along with training and consulting services for energy-environmental assessment and strategic analysis of electricity systems.

Adica is the exclusive commercial distributor of electricity system analysis software (ENPEP, GTMax and EMCAS) developed by Argonne National Laboratory.

ENPEP is used in over 70 countries for energy-economic-environmental assessment and greenhouse gas (GHG) mitigation assessment. A guidance document, published in 2002, provides guidelines on how the model can be used for national GHG studies.

The GTMax software is Argonne's premier tool for analysis of deregulated electricity markets. Under a current project sponsored by USAID, staff from Argonne are using GTMax for a multinational power market study in the Balkans. In addition, the University of Illinois - at Chicago, took advantage of Adica's educational discount when licensing GTMax for use in analyzing the Illinois electricity market.

In April 2002, Adica took part in the American Power Conference. During the APC, Argonne's new Electricity Market Complex Adaptive System (EMCAS) was presented under a session on electricity pricing in deregulated markets. The conference attendees were very interested in this new approach for analyzing electricity markets. One of the strengths of EMCAS is its ability to simulate different market operating rules ranging from those associated with a conventional vertically integrated

utility to those for a fully deregulated market operating under forward bidding procedures. The software is particularly well suited for countries (or States) that are moving from centrally regulated electricity systems to decentralized markets, which can use this tool to test regulatory structures before they are applied to real systems.

Following a successful round of meetings with power companies around the US, Adica and IRM (an European consulting firm) agreed to work together in marketing IRM's trading and risk management software. Under this agreement, Adica will serve as the North American Product Manager for IRM's system for Integrated Optimization of Power and Trade (IOPT). Adica has secured additional capital that will allow us to staff-up to support IOPT applications in the US.

Please visit the Adica website for additional information on our strategic analysis software. I would be happy to answer any question you may have and look forward to identifying opportunities for productive collaboration.

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**WAsP Team at Risø** The WAsP team at Risø announce that a one and a half day course in WAsP Engineering (not WAsP) will be held from time to time at Risø National Laboratory, Roskilde, Denmark. The course provides practical experience and confidence in using WAsP Engineering for the estimation of extreme winds, flow angles,

shear and turbulence in complex terrain. It also explains, in simple terms, some of the theoretical background for the calculations and provides an understanding of the limitations of the program.

If you are interested, please visit  
<http://waspengineering.dk>

**GTZ-MHPP in Indonesia** Chayun Budiono informed us about an interesting website of the Mini-Hydro Power Project Indonesia: <<http://www.mhpp.org/>>. There you will find their newsletters als PDF files. GTZ-MHPP is a cooperation project between the German and Indonesian Governments. The 'Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ)', a government-owned company, is entrusted by the German Federal Ministry for Economic Cooperation and Development (BMZ) with the responsibility for implementing the German contribution to the project.

The Project Holder is the Directorate General of Electricity and Energy Utilization (DitjenLPE) within the Indonesian Ministry of Energy and Mineral Resource.

**British Ocean Generator expected to start** A British company is preparing to install a prototype of its marine current turbine. Installation of a 300 kW unit should start this month if the weather is favourable, according to Peter Fraenkel of Marine Current Turbines Ltd. The company hopes to complete installation and start testing by late October. The facility was intended to be the world's first grid-connected marine current turbine, but MCT now plans to dump the electricity into heaters to avoid the cost of building a 3 km underwater cable. "The aim of the exercise is to gain test results rather than to sell electricity," explains Fraenkel. <<http://www.re-focus.net/>>

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