



**Workshop on Electricity and Development**  
**28 – 29 April 2005**  
**AIT Conference Center, AIT, Thailand**

## **Workshop Summary Report**

**(Draft)**

### **1. Introduction**

The Global Network on Energy for Sustainable Development (GNESD) in collaboration with UNEP, UNDP and the IEA are organizing a series of regional engagements and workshops focused on the role of electricity for promoting sustainable development. The dual challenge of linking electrification enhancement with national development goals, while providing increased electricity access to the poor, is the key theme for these series of workshops. The Asian regional workshop organised by the Asian Institute of Technology (AIT), the second of a series of 3 regional workshops, was aimed at bringing together the best minds in economic development, energy infrastructure and technology, finance and public policy to forge new, cost affective approaches to help create a sustainable energy future. The Asian regional workshop followed the “Electricity & Development” global workshop held at the IEA headquarters in Paris on 17-18 January 2005. As part of the same series, the Latin American and African regional workshops are being held in April and May in Rio and Nairobi respectively.

### **2. Organization and Objectives**

The Regional workshop on Electricity and Development was organized at the Asian Institute of Technology Conference Center (AITCC), Thailand with financial support from United Nations Environment Programme, UNEP Risoe Centre (URC), United Nations Development Programme (UNDP) and the International Energy Agency (IEA).

The workshop was coordinated by the Asian Institute of Technology (AIT), Thailand in collaboration with the Global Network on Energy for Sustainable Development (GNESD) and was held on 28-29 April, 2005. **58** participants coming from **13** countries and **6** international organizations and donor agencies attended the workshop. A detailed workshop program is provided in *Annex I*. List of the participants is given in *Annex II*.

The presentations and papers prepared by the speakers for the workshop are given in a CD enclosed with this report.

The **main objective** of the workshop was to discuss **the challenge of increasing the electricity access of the poor in a sustainable way**. **The role of electricity in the whole development process**, i.e. the way electricity can help to increase development indexes, was also **one of the main issue** addressed during the workshop. The issues, approaches, recommendations to deal with these two main themes, emerging from presentations and floor discussion are presented in the sections below.

### **3. Electricity and Development: Status and prospects in Asia**

Out of the 1.6 billion people still lacking of electricity access worldwide, more than one billion live in Asia. The status of electrification varies significantly within Asian countries. Less than 20% of the population have access to electricity in countries like Bhutan, Cambodia or Myanmar, whereas in Singapore or Thailand almost 100% of the people have access to electricity. Similarly, dependence on traditional biomass is still very high in countries like Cambodia and Laos.

Demand for power is expected to grow tremendously in the coming years and the International Energy Agency (IEA) is estimating that an additional capacity of 2,437 GW will have to be installed by 2030 in developing countries. China alone is expected to increase its installed power capacity by almost 900 GW and the rest of Asia by almost 500 GW. This increase of demand for power creates two major challenges that have to be addressed: investment and sustainability.

IEA estimates that for all developing countries worldwide an investment of more than 5.2 trillion dollars by 2030 will be needed to satisfy the power demand. Even with such investments, the total population without access to electricity would still exceed 1.5 billion people in 2030. To reduce this figure below 1 billion, another 202 billion dollars will be necessary.

The second challenge is related to environmental implications of proving electricity access. For example in South-East Asia, the ASEAN Centre for Energy (ACE) estimates that the power demand in 2020 will be met mainly by fossil fuels, namely coal (44.84%) and gas (39.83%). The adverse impacts on, both, the local and global environment of these two fuels are well known.

Electricity consumption varies tremendously from a country to another. Various studies have reported the linkages between economic growth and energy consumption or development (measured by the Human Development Index (HDI)) and energy/electricity consumption. However, it is now acknowledge that electricity alone may not be a sufficient condition to improve development of the poorest of the poor. Issues related to enhancement of electricity access and development process are presented and discussed in section 5.

#### **4. The challenge of increasing the electricity access of the poor in a sustainable way (economically and environmentally)**

The current trend for power sector development is interconnectivity of grid within different countries. In South-East Asia, four such interconnected grids will be in operation by the end of 2005 and 10 more are planned in the near future. However, large scale power generation and grid transmission will not necessarily enhance electricity access of the poor, especially for those located in the most remote areas, inaccessible by grid. The role of communities in enhancing energy access of the poor has to be emphasized. Multilateral and bilateral donor agencies, government and NGOs will have to include communities in their power sector development plans. It is not yet the case.

The paradox of development and environment was also recognised during the workshop. Electricity is essential for development but its generation, transmission and utilisation affects environment. Theoretically, the reconciliation between electricity and environment can happen if the electrification is coupled with energy efficiency and renewable energy to reduce the environmental impacts.

Renewable energies are perceived to be more expensive than conventional energy sources. In South-East Asia, as pointed out by a participant, due to the cost factors the transition to greater dependence on renewable energy technologies is slow, but these technologies might get greater focus after 2010. However, renewable energy technologies (RETs) can be a cheaper alternative for rural electrification. In the case of remote areas in Nepal for example, decentralised RETs (in this case solar PV and micro-hydro) cost around one fourth as much as grid extension. A careful assessment of each specific situation is therefore required before selecting one or the other option for rural electrification.

In that respect, the policies in place can play a crucial role. For example, in Thailand the least cost option for power generation is currently coal. This might change if pricing policies reflecting its real cost to the society are implemented.

It appears that power sector policies are often biased in favour of centralised generation. Grid electricity is often heavily subsidised and decentralised options cannot compete if not equally subsidised. The ultimate possibility to level the playing field would be to allow for a competitive bidding for electrification subsidy. Since in any case both grid and decentralised options require subsidy to provide electricity access to the poorest, the use of competitive bidding would allow to propagate the systems that can provide the best quality and coverage for same level of subsidy. However, in many countries, the present institutional power sector structure does not allow that kind of situation.

The question of subsidies to make electricity affordable for the poorest has been raised in several occasions. For some participants, subsidies are necessary to enhance electricity access for all whereas for other participants they should not be used because they create a market distortion. Thailand provides a good example where cross subsidies in electricity tariffs had a good impact to enhance electricity access by the poor.

One of the issues raised to explain the relatively low development of renewable energy technologies in the region is the lack of capacity available in this field. More emphasis should be put on training and capacity buildings for renewable energies. One of the important points quoted for the successful development of RETs is the need of a good coordination among institutions dealing with these issues at the national level. The Ministry of Non-Conventional Energy Sources (MNES) in India was quoted as a good example of a strong national institution promoting RETs. Such a body can set a favourable framework policy for RETs, such as subsidy schemes, certification of RETs agencies, etc.

The question of financing is of primary importance. In developing countries, donor agencies are often directly funding the electrification programmes through grants or loans. These agencies could play a major role in influencing the choice of technologies or the policies (tariffs, infrastructure, etc.) to implement along with electrification programmes.

To reduce dependency on donor agencies, the issue of financing can be addressed by government policies that are conducive to enable private sector to come in for private-public partnership. However, as pointed out by some of the participants, electricity access should remain a public service and states should play a dominant role.

For small scale decentralised power generation, micro-financing institutions can provide a good solution to overcome the investment barriers. Unfortunately, these financial intermediaries have often a very different culture from that of technology vendors. However, some successful examples can be quoted: Grameen Shakti provides Solar Home System combined with micro-credit schemes in Bangladesh. In Nepal, Winrock International is working with 300 microfinance institutes to finance renewable energy technologies.

The role international mechanisms such as Clean Development Mechanisms (CDM) can play was pointed out as a way to promote cleaner power plants. However, it was mentioned by some that this process takes a long time to be accepted and that sometimes the capacity to implement such processes is lacking.

It has been pointed out that in the region, there is opposition from local communities in recent years to coal and large hydro projects. This could help to promote renewable energies.

## **5. The role of electricity in the whole development process**

If it can be said that electricity is one of the required element to insure development of the poor worldwide, access to electricity per se is certainly not sufficient to alleviate poverty. Enhancement of electricity access for the poor should be accompanied by other measures promoting use of electricity for development. Consideration of macro indicators like GDP, HDI at the country level to assess impact of electricity in development does not allow to consider disparities within the country.

The causality of electricity to the development was strongly debated during the workshop. Within a country, socio-economic data of electrified and non-electrified villages can be compared, but it is probably too simplistic to say that the better development indexes are only due to electricity. Electricity can also make rich people richer, hence increasing global development indexes whereas the effect on the poor remains marginal.

Rural electrification programmes, are often not targeted specifically to poor. In India for example, a village is considered as electrified if all public structures (schools, health centres, community houses, etc.) and 10% of the households are electrified. This 10% of population often do not include the poor.

It appears that when the grid reaches a village, the connection charges are often too high for poor household to get connected. Electricity appliances are also sometimes not affordable for the poorest of the poor, making electricity not useful for them. Another issue raised is that some poor households sometimes do not have necessary legal documents (property rights, etc) to get a connection. Finally, in rural areas, income flows are often cyclical and do not necessarily match the electricity bill payment cycle. For all these reasons, enhancement of access should be accompanied by other measures, making it possible for the poor to use and benefit from electricity.

It appears that electricity should be seen as a vehicle to provide services, rather than an end in itself. As pointed out by a participant in the workshop, "The main issue is electricity for what?". To have a better impact on development, electricity should allow the development of income generating activities for poor and non-poor alike. This is the only way to insure that grid connected people will be able to pay for their electricity bill and that investment can be reimbursed in the long run. For utilities, productive uses of electricity is also a way to insure a minimum load. To facilitate this process small entrepreneurs coming to invest in rural areas should be encouraged by adequate policies.

In Nepal, several examples showed that decentralized power plants became viable when users started using the electricity to pursue income generating activities. A holistic package where each household undertakes a commercial activity to generate additional income which corresponds to the minimum payment of electricity has been developed.

In Thailand, the agency responsible for the rural electrification programmes tried to pursue the villager to use electricity in rice mills, to irrigate their fields and in other village level activities. The staff showed them that they could save/earn more money by using electricity. At some local levels financial institutions were roped in to provide funds.

For renewable energies, mixing productive and consumptive uses can be away to insure the financial viability of the project and to attract the support of financial institutions. For example, in Indonesia, a renewable energy project has been designed in a way so that for each kW of capacity created in the village 10,000 Rs is given as the seed money to create revolving fund to initiate income generating activities. Another important lesson from

this Indonesian project is the fact that projects owned by individual were not successful as they resulted in growing disparity and which resulted in disruption of projects by groups not benefiting from it. The community projects were found to be more sustainable.

Assessing the electricity access of the poor is a difficult task, as segregated data is not readily available. Proxies have to be used either geographical (rural vs urban) or in terms of electricity consumption (under a certain consumption, users are considered as poor). These proxies might affect the findings of such assessments.

Finally, the role of electricity in gender development needs to be further studied. Data is not readily available, as it is difficult to desegregate electricity consumption between males and females. Gender usually does not appear as an issue as such in electricity development programmes. However, in developing countries, women are important household electricity consumers as they often stay at home to look after the children and cook.

If electricity can certainly play an important role in gender development, it cannot empower woman as such. Electrification programmes should include gender dimensions and be linked with social development issues.

## **6. Conclusion**

Electricity and development are linked but electricity itself is not enough to insure sustainable development of the poorest areas in the world. New and innovative policies should be implemented, along with rural electrification programmes, to insure that electricity will positively affect lives of the poorest, still lacking access to a modern form of energy. Electricity should be affordable and reliable and allow the development of income generating activities. The appliances allowing to convert electricity into a useful application should be also available at the local level and affordable for the poor. Electricity can also have a very positive impact on gender development, if social dimension is addressed in electrification programmes.

Innovative policies to finance and implement in a holistic way electrification programmes have to be designed and approved by governments. As pointed out by a participant in the concluding session: "Our education is traditional, governments are traditional and traditional paths are usually followed. There is a need to get away from this and think of new ways of integrating electricity into development." Innovative ways of using subsidy to stimulate the markets to make the investment and change should also be found. This requires a close international cooperation among stakeholders.

There is a need to develop a new way of thinking. Electricity should be seen as a way to provide services and not as an end in itself. Electricity expansion programmes will not positively impact development of the poor, if electricity is not an affordable and reliable vehicle to provide services benefiting all. The traditional top-down approaches should be

replaced by bottom-up ones. Communities should be at the centre of the decision making process.

One also has to make sure that policies are really implemented in the field. Too often in developing countries, good ideas remain only as objectives but the policies to reach this target are not in place.

As put by one of the speaker, the blame for a quarter of population deprived of energy cannot be nature or technology, as there is the abundance of energy provided by nature, but the lack of appropriate policies creates such islands of deprivation.

# **Annex 1**

### About the Workshop

The Global Network on Energy for Sustainable Development (GNESD) in collaboration with UNEP, UNDP and the IEA are organizing a series of regional engagements and workshops focused on the role of electricity for promoting sustainable development. This workshop organised at AIT is the second of a series of 3 regional workshops, with the aim to bring together the best minds in economic development, energy infrastructure and technology, finance and public policy to forge new, cost effective approaches to help create a sustainable energy future. The dual challenge of linking electrification enhancement with national development goals, while providing increased electricity access to the poor, is the key theme for these series of workshops.

The Asian regional workshop follows the "Electricity & Development" global workshop held at the IEA headquarters in Paris on 17-18 January 2005. As part of the same series, the Latin American and African regional workshops are being held in April and May in Rio and Nairobi respectively.

The Asian Institute of Technology (AIT), located in Bangkok, Thailand, one of the 10 Centres of Excellence of GNESD, is organising the Asian regional workshop of the series. This event aims to bring to the attention of Asian policy makers the various issues related to electricity access and national development.

### Programme

**Venue:** AIT Conference Centre (AIT CC), Room B108

#### **Wednesday, 27 April 2005:**

19:00-21:00 Registration

#### **Thursday, 28 April 2005**

8:00 – 8:30 Registration (contd)

#### 8:30 – 9:00 **Inauguration Session**

Welcome Address by *Chongrak Polprasert*, Dean, SERD, AIT

Address by *Surendra Shrestha*, Regional Director, UNEP/ROAP

Opening Address by *Mario T. Tabucanon*, Acting President, AIT

9:00 – 9:30 **Group Photo Session**

#### **Coffee/Tea Break**

9:30 – 10:50 **Session 1: Electricity and Development – setting the scene**

**Chairperson:** *Ram M. Shrestha*, AIT

*Romeo Pacudan*, UNEP-URC, Electricity and Development: Global Trends and Key Challenges

*Kelly Hayden*, UN/ESCAP, Electricity and development: the Asian perspective.

*Weerawat Chantanakome*, ASEAN Centre for Energy, Electricity and Development: key challenges for ASEAN

*Darayes Mehta*, World Bank, Electricity and Development: The Role of the World Bank Group

10:50 – 11:10 Discussion

11:10 – 11:25 **Coffee/Tea Break**

11:25 – 12:25 **Session 2: Electricity Access and Millennium Development Goals**

**Chairperson:** *S. Kumar*, AIT

*Abul Barkat*, University of Dhaka, Bangladesh, Access to Electricity in Rural Bangladesh: Some Empirical Evidences of Socio-Economic Impact

*Bir Bahadur Ghale*, Barpak Rural Electrification(Pvt). Ltd, Nepal, Productive end-use of Micro Hydro power: Promoting cottage industries in remote areas in Nepal.

*Sadaka Halim*, University of Dhaka, Bangladesh, Gender and Rural Electrification : A Case from Bangladesh.

12:25 – 12:45 Discussion

12:45 – 14:30 **Lunch**

14:30 – 15:45 **Session 3: Grid Connected and Decentralized Power Generation**

**Options: How to Level the Playing Field?**

**Chairperson:** *Weerawat Chantanakome*, ASEAN Centre for Energy

**Panellists:**

*Lalith Gunaratne*, LGA Consultants (Pvt) Ltd, Sri Lanka

*Bikas Pandey*, Winrock International, Nepal

*Vishaka Hidellage*, ITDG South-Asia, Sri Lanka

Discussion

15:45 – 16:00 **Coffee/Tea Break**

16:00 – 17:00 **Session 4: Innovative Decentralised Electricity Supply Programs: Sharing the Experience**

**Chairperson:** *Pradeep Jain*, Rural Electrification Corporation

Limited, India

*Sanjit Bunker Roy*, Barefoot College, India, Solar Energy to Generate Income: The Barefoot Approach

*Dipal Barua*, Grameen Shakti, Bangladesh, Rural Electrification with Solar Home Systems: Lessons Learned from Grameen Shakti

*Kiran Man Singh*, Rural Energy Development Programme, Nepal, The Success Story of Micro-Hydro in Nepal

17:00 – 17:15 Discussion

18:30 **Reception Dinner, AIT CC**

Friday, 29 April 2005

8:30 – 9:50

**Session 5: Electricity and Poverty: GNESD key findings**

**Chairperson:** Pipat Hongladarom, Electricity Generating Authority of Thailand (EGAT), Thailand

*Neha Misra, TERI, India*, Power sector reforms and their impact on the poor: GNESD key findings focussing on India and the Philippines cases study.

*Ram M. Shrestha, AIT*, Institutional Reforms and their Impact in Rural Electrification: Case Study From South and South-East Asia

*Gao Hu, ERI, China*, Policy Options for Cleaner Energy Services for the Poor: The Case of China

*Mila Jude, Global Network on Energy for Sustainable Development*, Opportunities, Barriers and Policies to promote the use of RETs for Poverty Alleviation and Rural Development

9:50 – 10:10

Discussion

10:10 – 10:30

**Coffee/Tea Break**

10:30 – 11:50

**Session 6: Electricity development and the investment challenge**

**Chairperson:** Chrysanthus S. Heruela, Department of Energy, Philippines  
*Anthony J. Jude, ADB*, Power Development & Investment Challenges: A GMS Region Perspective

*Sat Samy, Ministry of Industry Mines and Energy, Cambodia*, Investment for Rural Electrification Development: The Case of Cambodia

*Pipat Hongladarom, Electricity Generating Authority of Thailand (EGAT), Thailand*, Thailand Power Development For Sustainable Energy

*Bharat Tamang, Ministry of Trade and Industry, Bhutan*, Investment for Hydropower Development: The Case of Bhutan

11:50 – 12:10

Discussion

12:10 – 13:40

**Lunch**

13:40 – 15:00

**Session 7: Enhancement of electricity access and sustainable power sector development: The dual policy challenge**

**Chairperson:** Anthony J. Jude, A

*Helianti Hilman, YBUL, Indonesia*, Innovative financing mechanisms for a sustainable development of the power sector

*Chrysanthus S. Heruela, Department of Energy, Philippines*, The dual policy challenge in the Philippines

*Benhur P. L. Tobing, Ministry of Energy and Mineral Resources, Indonesia*, Enhancement of Electricity Access in Indonesia

15:00 – 15:20

Discussion

15:20 – 15:40

**Coffee/Tea Break**

15:40

**Concluding Session**

Concluding remarks by *Surendra Shrestha, Regional Director, UNEP/ROAP*  
Vote of thanks by *S. Kumar, Professor, Energy Field of Study, AIT*

## WORKSHOP

on

### Electricity and Development

28-29 April 2005

Asian Institute of Technology  
Bangkok, Thailand



**Organised by**

Asian Institute of Technology (AIT)  
Global Network on Energy for Sustainable Development (GNESD)

**Sponsored by**

United Nations Environment Programme (UNEP)  
UNEP Risoe Centre (URC)  
United Nations Development Programme (UNDP)  
International Energy Agency (IEA)

# **Annex 2**

**Electricity and Development Workshop**  
**28-29 April 2005**  
**List of Participants**

**Prof. Abul Barkat**

Economics Department  
University of Dhaka  
Human Development Research Centre (HDRC)  
House 5, Road 8, Mohammadia Housing Society  
Mohammadpur, Dhaka 1207, Bangladesh  
Tel (off): +88 02 811 6972, 815 7621  
Tel (res): +88 02 815 7620  
Fax: +88 02 815 7620  
E mail: [info@hdrc-bd.com](mailto:info@hdrc-bd.com), [hdrc@bangla.net](mailto:hdrc@bangla.net)  
Website: [www.hdrc-bd.com](http://www.hdrc-bd.com)

**Mr. Dipal Chandra Barua**

Managing Director  
Grameen Shakti  
Grameen Bank Bhaban  
Mirpur -2, Dhaka -1216, Bangladesh  
Tel (off): +8802 8011222  
Tel (res): +8802 8011087  
Fax: + 8802 801 3559  
E-mail: [dipal@grameen.com](mailto:dipal@grameen.com)

**Dr. Sadeka Halim**

Associate Professor  
Department of Sociology  
University of Dhaka, Arts Building  
Ramna, Dhaka 1000, Bangladesh  
Tel (off): +88 02 966 1920/Ext 4504  
Tel (Res): 88 02 8129986  
Mobile: 0171 538560  
Fax: +88 02 861 5583  
Email: [sadeka@bangla.net](mailto:sadeka@bangla.net)

**Mr. Mahfuzur Rahman**

Member ( PBS Training)  
Rural Electrification Board  
Dhaka, Bangladesh  
Joar Shahara, Khilkhet, Dhaka – 1229  
Bangladesh  
Tel (off): 88 02 891 6416  
Tel (res): 88 02 8917491  
Fax: 88 02 8916400  
Mobile: 88 017 595470  
Email: [mbrpbst@citecho.net](mailto:mbrpbst@citecho.net)

**Mr. Bharat Tamang**

Head, Planning & Coordination Division  
Department of Energy, Bhutan  
Ministry of Trade & Industry  
Royal Government of Bhutan  
Thimphu, Bhutan  
Tel (off): +975 232 5097  
Fa (res): +975 2351506  
Email: [pcd1@druknet.bt](mailto:pcd1@druknet.bt), [btyonzen@yahoo.com](mailto:btyonzen@yahoo.com)

**Mr. Gem Tshering**

General Manager, Transmission Department,  
Bhutan Power Corporation.  
Thimbu, Bhutan  
Te (off): +00975 2 325095 (ext- 301)  
Tel (res):+975 2 351307  
Fax: +975 2 322279  
Mobile: +975 1762758  
Email: [gemtshering@bpc.com.bt](mailto:gemtshering@bpc.com.bt)

**Dr. Chulasa Praing**

Deputy Director  
Corporate Planning  
Electricite du Cambodge 9 EDC  
St.19 Wat Phnom, Daun Penh District  
Phnom Penh, Cambodia  
Tel: +855 12 444 968  
Fax: +855 23 426 018  
Email: [Chulasa@online.com.kh](mailto:Chulasa@online.com.kh)

**H.E. Dr. Sat Samy**

Under Secretary of State  
Ministry of Industry, Mines and Energy  
45 Preah Norodom Building  
Phnom Penh, Cambodia  
Tel (off): +855 12 299399  
Tel (res): +855 23 990602  
Fax: +855 23 990 602  
Email: [mimedet@forum.org.kh](mailto:mimedet@forum.org.kh)

**Dr. Gao Hu**

Energy Research Institute of National Development and  
Reform Commission, P. R. China  
B – 1418, GuaHong Mansion  
Muxidibeili Jia – 11, Xicheng District  
Beijing, 100038, China  
Tel: 86 10 63908468  
Fax: 86 10 63908468  
Email: [gaohu@amr.gov.cn](mailto:gaohu@amr.gov.cn)

**Ms. Sun Yaqin**

Deputy Section Chief  
Bureau of Rural Hydropower and Electrification  
Development  
The Ministry of Water Resources  
2, Lane 2, Baiguang Rd, Beijing, China  
Tel: 86-10- 632 02935  
Fax: 86-10- 63202949  
Email: [yqsun@mwr.gov.cn](mailto:yqsun@mwr.gov.cn)

**Ms. Mila J. Jude**

Programme Officer Secretariat  
Global Network on Energy for Sustainable Development  
(GNESD)  
Risø National Laboratory  
P.O. Box 49  
DK-4000 Roskilde, Denmark  
Mobile: +45 2063 3979.  
Email: [mila.jude@risoe.dk](mailto:mila.jude@risoe.dk)

**Dr. Romeo Pacudan**

Senior Economist  
UNEP Risoe Centre on Energy  
Climate and Sustainable Development (URC)  
Riso National Laboratory, Bldg.142  
Frederiksborgvej 399  
P. O. Box 49, DK 4000 Roskilde, Denmark  
Fax: +45 4632 1999  
Email: [romeo.pacudan@risoe.dk](mailto:romeo.pacudan@risoe.dk)

**Mr. Pradeep Jain**

Executive Director (Administration & Business  
Development)  
Rural Electrification Corporation Limited  
Core 4, SCOPE Complex, 7 LODHI ROAD  
Residence Address & No.: A-9/12  
Vasant Vihar  
New Delhi, India  
Tel: 91 11 24362483 (O)  
Fax: 91 11 24365329  
Mobile: 91 99402256  
Email: [pradeepjain@recl.nic.in](mailto:pradeepjain@recl.nic.in)

**Ms Neha Misra**

Area Convener  
Energy Reforms  
Regulatory Studies and Governance Division  
The Energy and Resource Institute (TERI)  
Darbari Seth Block, IHC Complex  
Lodhi Road, New Delhi - 110 003n INDIA  
Tel. +91 11 2468 2100  
Fax +91 11 2468 2144  
Email : [neha@teri.res.in](mailto:neha@teri.res.in)

**Mr. Sanjit Bunker Roy**

Barefoot College, Village Tilonia 305816  
Madanganj Ajmer, Rajasthan, India  
Tel: +91 1463 88204  
Fax: +91 1463 288206  
Email: [bunker@ndb.vsnl.net.in](mailto:bunker@ndb.vsnl.net.in)  
[bunker\\_roy@yahoo.com](mailto:bunker_roy@yahoo.com)

**Dr. Weerawat Chantanakome**

Executive Director  
ASEAN Centre for Energy (ACE)  
Directorate General of Electricity and Energy Utilization  
Complex  
Jl. HR Rasuna Said, Block X-2, Kav.07-08  
Kuningan, Jakarta 12950  
Indonesia  
Tel (off): + 62 21 527 9329  
Tel( res): + 6221 8379 9597  
Fax: + 62 21 527 9350  
E-mail: [weerawat@aseanenergy.org](mailto:weerawat@aseanenergy.org)

**Mr. Helianti Hilman**

Executive Director  
Yayasan Bina Usaha Lingkungan  
Jalan Hang Lekir VI No. 1, Kebayoran Baru  
Jakarta 12120  
Indonesia  
Fax: + 62-21-722 0905  
Tel: + 62-21-720 6125  
Email: [admin@ybul.or.id](mailto:admin@ybul.or.id)

**Mr. Benhur P. L. Tobing**

Sub Directorate of Social Electricity  
Directorate General of Electricity & Energy Utilization  
Jl. HR Rasuna Said Block X 2 Kav. 7 - 8  
Kuningan, Jakarta Selatan  
Indonesia  
Tel: 5255180/5256084  
Fax: 5279348  
Email: [bz032003@yahoo.com](mailto:bz032003@yahoo.com)

**Mr. Keovongsouk Souliyadeth**

Assistant Manager  
General Manger's Office  
Electricite du Laos (EDL)  
Nongbone Road, P.O. Box 309  
Vientiane, Laos  
Tel: 856-21 451519 ext. 134,  
Fax: 856-21 460531  
Email: [edlgmo@laotel.com](mailto:edlgmo@laotel.com)

**Mr. Farooq Mohamed Hassan**

Assistant Director General  
Republic of Maldives  
Ministry of Communication, Science and Technology  
4th Floor, Aage, Boduthakurufaanu Magu,  
Malé, Republic of Maldives, Maldives  
Tel: +960 7733693396/331696  
Tel: +960 322087 10 88 (O)  
Mobile: +960 77 33 69  
Fax: +960 331694  
Email: [farooq@mcst.gov.mv](mailto:farooq@mcst.gov.mv)

**Mr. Bir Bahadur Ghale**

Owner/President  
Barpak Rural Electrification ( Pvt) Ltd/ Nepal MHPE  
Federation, Samakhusi  
Kathandu, Nepal  
Tel: 0977-1435 6026  
Fax: 0977-1-436 1366  
Email: [ghalebir@hotmail.com](mailto:ghalebir@hotmail.com)  
[nmhefnepal@hotmail.com](mailto:nmhefnepal@hotmail.com)

**Mr. Bikas Raj Pandey**

Country Representative  
Winrock International Nepal  
1103/68 Devkota Marga, Baneshwor  
P. O. Box 1312  
Kathmandu, Nepal  
Tel (off): +977-1-4467087  
Tel (res) : +977-1-4280676  
Fax: +977 1 447 6109  
Email: [bpandey@winrock.org.np](mailto:bpandey@winrock.org.np)

**Mr. Balaram Shrestha**

General Manager  
Nepal Electricity Authority  
Durbar Marg, Kathmandu, Nepal  
Tel (res): +977 1 422 5499  
Tel (res): +977 1 4474267  
Fax: +977 1 422 5298  
Email: [rashmi@mail.com.np](mailto:rashmi@mail.com.np)

**Mr. Kiran Man Singh**

National Programme Manager  
Rural Energy Development Programme (REDP)/UNDP,  
P.O. Box #107  
Kathmandu, Nepal  
Tel: +977 1- 552 0048  
Res : 977 1 552 9049  
Fax: +977 1 552 1547  
Email: [Kiran@redp.wlink.com.np](mailto:Kiran@redp.wlink.com.np)  
[redpctm@mos.com.np](mailto:redpctm@mos.com.np)

**Mr. Anthony J. Jude**

Senior Project Engineer, Project Administration Unit,  
Head  
Asian Development Bank  
6 ADB Ave. Mandaluyong City  
Manila, Philippines  
Tel (632) 632-6409  
Email: [ajude@adb.org](mailto:ajude@adb.org)

**Mr. Rafael Abergas**

Department Manager Planning  
National Power Corporation  
Cor. Agham Rd & Quezon Ave, Dilman, Quezon City,  
Philippines  
Tel: 02-921-3319  
Fax: 02-921-3319  
Email: [rlabergas@napocor.gov.ph](mailto:rlabergas@napocor.gov.ph)

**Mr. Chrysanthus S. Heruela**

Director  
Department of Energy  
Merritt Road, Fort Bonifacio, Taguig City, Metro Manila,  
Philippines  
Tel: +632-840-21-73  
Fax: +632-8402173  
Email: [cheruela@doe.gov.ph](mailto:cheruela@doe.gov.ph)

**Mr. Lalith Gunaratne**

Director  
LGA Consultants (Pvt) Ltd / Sage Training (Pvt) Ltd  
7 Skelton Gardens  
Colombo 5, Sri Lanka  
Tel (off): +94-11-4519744  
Tel (res)): 91 11 2574722  
Mobile: 94 777 283837  
Fax: +94-11-4518944  
Email: [lga@diamond.lanka.net](mailto:lga@diamond.lanka.net) , [lalithg@sri.lanka.net](mailto:lalithg@sri.lanka.net)  
URL: [www.sagetraining.org](http://www.sagetraining.org)

**Dr. Vishaka Hidellage**

Director  
ITDG South Asia  
5, Lionel Edirisinghe Mawatha, Kirulapone, Colombo 05,  
Sri Lanka  
Tel (off): +94 11 2829 412 – 5  
Tel (res): 94 11 2 835966  
Fax: +94 11 2856 188  
e-mail: [itdg@itdg.slt.lk](mailto:itdg@itdg.slt.lk)  
[NilanthiG@itdg.slt.lk](mailto:NilanthiG@itdg.slt.lk)

**Mr. Damitha Kumarasinghe**

Senior Professional  
Public Utilities Commission of Sri Lanka  
Level 6, BOC Merchant Tower  
St. Michael's Road, Colombo 03, Sri Lanka  
Tel (off): +94-11-2392607  
Tel (res):+94-777-572958  
Fax: +94-11-2392641  
E-mail: [damitha@puosl.gov.lk](mailto:damitha@puosl.gov.lk)

**Ms. Ana Sawad Kebasen**

Project Assistant  
Energy Field of Study  
School of Environment, Resources and Development  
Asian Institute of Technology  
P.O Box 4, Klong Luang, Parthumthani 12120  
Thailand  
Tel: +66 2 524 6582  
Fax: +66 2 524 5419/5439  
Email: [anasawad@ait.ac.th](mailto:anasawad@ait.ac.th)

**Ms. Anuja Baidya**

Research Assistant  
Energy Field of Study  
School of Environment, Resources and Development  
Asian Institute of Technology  
P.O Box 4, Klong Luang, Parthumthani 12120  
Thailand  
Tel: +66 2 524 6582  
Fax: +66 2 524 5419/5439  
Email: [anuja@ait.ac.th](mailto:anuja@ait.ac.th)

**Dr. Bundit Limmeechokchai**

Associate Professor  
Sirindhorn International Institute of Technology  
P.O.Box 22, Thammasat-Rangsit Post office  
Klong Luang, Pathumthani 12121, Thailand  
Tel: +66-2-986 9009, Ext 2206  
Fax: +66-2-986 9009 ext 2201  
Email: [bundit@siit.tu.ac.th](mailto:bundit@siit.tu.ac.th)

**Mr. Darayes Mehta**

Consultant Power  
The World Bank  
30<sup>th</sup> Floor, Siam Tower  
989 Rama 1 Road, Pathumwan, Bangkok 10330  
Bangkok 10330, Thailand  
Tel: 66 02 686 8355  
Fax: 66 02 256 7794  
Email: [dbmehta@vsnl.com](mailto:dbmehta@vsnl.com)

**Mr. Francisco Quintana**

Research Analyst  
World Bank  
30<sup>th</sup> Floor, Siam Tower, 989 Rama 1 Road  
Pathumwan, Bangkok 10330, Thailand  
Tel: 66 02-686 8355  
Fax: 02 256 7794  
Email: [fquintana@worldbank.org](mailto:fquintana@worldbank.org)

**Mr. Janak Shrestha**

Research Associate  
Energy Field of Study  
School of Environment, Resources and Development  
Asian Institute of Technology  
P.O Box 4, Klong Luang,  
Parthumthani 12120, Thailand  
Tel: +66 2 524 6582  
Fax: +66 2 524 5419/5439  
Email: [janaks@ait.ac.th](mailto:janaks@ait.ac.th)

**Ms. Kelly Hayden**

Associate Economic Affairs Officer  
UNESCAP  
United Nations Building, Rajadamnern  
Nok Avenue, Bangkok, Thailand  
Tel: 02 288 1544  
Fax: 02 2881059  
Email: [haydenk@un.org](mailto:haydenk@un.org)

**Mr. Migara Liyanage**

Research Associate  
Energy Field of Study  
School of Environment, Resources and Development  
Asian Institute of Technology  
P.O Box 4, Klong Luang  
Parthumthani 12120, Thailand  
Tel: +66 2 524 6582  
Fax: +66 2 524 5419/5439  
Email: [migara@ait.ac.th](mailto:migara@ait.ac.th)

**Prof. Ram M. Shrestha**

Professor  
Energy Field of Study  
School of Environment Resources and Development  
Asian Institute of Technology  
P.O Box 4, Klong Luang  
Parthumthani 12120, Thailand  
Tel: +66 2 524 5406  
Fax: +66 2 524 5439  
Email: [ram@ait.ac.th](mailto:ram@ait.ac.th)

**Mr. Rene Andersen**

Environmental Counsellor  
Danida  
c/o Royal Danish Embassy  
Sathorn, Soi 1  
Bangkok, 10120, Thailand  
Tel: (66 2) 343 1100-10  
Fax: (66 2) 213 1752

**Mr. Kanchana K. W. Siriwardena**

Research Associate  
Energy Field of Study  
School of Environment, Resources and Development  
Asian Institute of Technology  
P.O Box 4, Klong Luang  
Parthumthani 12120, Thailand  
Tel: +66 2 524 5423  
Fax: +66 2 524 5439/524 5419

**Mr. Mads Korn**

Senior Programme Officer  
European Union  
Kian Gwan House II-19th Floor  
140/1 Wireless Road  
Bangkok 10330, Thailand  
Tel 02 305 2600 ext 2736  
Fax: 02 255 9113/ (66 2) 255 9110  
Email: [mads.korn@cec.eu.int](mailto:mads.korn@cec.eu.int)  
[somporn.na-lampang@cec.eu.int](mailto:somporn.na-lampang@cec.eu.int)

**Mr. Pipat Hongladarorn**

Assistant Governor-System Control  
Electricity Generating Authority of Thailand (EGAT)  
53 Charan Sanitwong Road Bang Kruai  
Nonhtaburi 11130, Thailand  
Tel: 02 436 2021  
Fax: 02 636 2095/ 02 436 2095  
Email: [pipat.h@egat.co.th](mailto:pipat.h@egat.co.th)

**Mr. Rudolph Rauch**

Principal Advisor  
Energy-Eco-Efficiency in Agro-Industry,  
(E-3 Agro Project)  
GTZ Office Bangkok, Thailand  
193/63 Lake Rajada Bldg., 16th Fl New Ratchadapisek  
Rd.,  
Bangkok 10110, Thailand  
Tel No: 02-226-1491  
Fax: 02-226-1592  
Email: [rudolph.rauch@gtz.de](mailto:rudolph.rauch@gtz.de)

**Dr. Pongpisit Viseshakul**

Director  
Natural Resource, Environment  
Science and Technology  
National Economic and Social Development Board  
(NESDB)  
962 Krung Kasem Rd Pombrap District  
Bangkok 10100, Thailand  
Tel (off): 01 909 05 0512  
Tel (Res): 02 241 1441  
Email: [pongpisitv@yahoo.co.uk](mailto:pongpisitv@yahoo.co.uk)

**Ms. Rajani Amatya Rajbhandari**

Research Associate  
Energy Field of Study  
School of Environment, Resources and Development  
Asian Institute of Technology  
P.O Box 4, Klong Luang  
Parthumthani 12120, Thailand  
Tel: +66 2 524 5422  
Fax: +66 2 524 5419/ 5439  
Email: [rajani@ait.ac.th](mailto:rajani@ait.ac.th)

**Mr. Surendra Shrestha**

Regional Director and Representative for Asia and the  
Pacific  
(UNEP/ROAP)  
United Nations Building  
Rajdamnern Avenue  
Bangkok 10200, Thailand  
Tel: 66 2 52/66 2 288 1870  
Fax: 66 2 524 1001/66 2 280 3829  
[Shreshtha@rrcap.unep.org](mailto:Shreshtha@rrcap.unep.org)

**Prof. Sivannapan Kumar**

Energy Field of Study  
School of Environment, Resources and Development  
Asian Institute of Technology  
P.O Box 4, Klong Luang, Parthumthani 12120  
Thailand  
Tel: +66 2 524 5410  
Fax: +66 2 524 5439  
Email: [kumar@ait.ac.th](mailto:kumar@ait.ac.th)

**Dr Mithulanathan Nadarajah**

Energy Field of Study  
School of Environment, Resources and Development  
Asian Institute of Technology  
P.O Box 4, Klong Luang, Parthumthani 12120, Thailand  
Tel: +66 2 524 5405  
Fax: +66 2 524 5439  
Email: [mithulan@ait.ac.th](mailto:mithulan@ait.ac.th)

**Mr. Samerjai Suksumek**

Director, Monitoring and Evaluation Division  
Energy Policy and Planning Officer  
121/1-2 Phetchaburi Rd. Ratehathewi  
Bangkok 10400, Thailand  
Tel: 02-612-1303  
Fax: 02-612-1364  
Email: [samerjai@eppo.go.th](mailto:samerjai@eppo.go.th)

**Mr. Sangaun Anutarasotti**

Deputy Director  
System Planning Department  
Provincial Electricity Authority  
200 Ngam Wong Wan Road, Chatuchak  
Bangkok 10900, Thailand  
Tel: 66 2590-5701  
Fax: 66 2590 5299  
Email: [sanguan.anu@pea.co.th](mailto:sanguan.anu@pea.co.th)

**Dr. Sudhir Sharma**

Senior Program Specialist  
Energy Field of Study  
School of Environment, Resources and Development  
Asian Institute of Technology  
P.O Box 4, Klong Luang  
Parthumthani 12120, Thailand  
Tel: +66 2 524 5423  
Fax: +66 2 524 5439  
Email: [sudhir@ait.ac.th](mailto:sudhir@ait.ac.th)

**Dr. Sunil Malla**

Senior Program Specialist  
Energy Field of Study  
School of Environment, Resources and Development  
Asian Institute of Technology  
P.O Box 4, Klong Luang, Parthumthani 12120  
Thailand  
Tel: +66 2 524 5423  
Fax: +66 2 524 5439  
Email: [sudhir@ait.ac.th](mailto:sudhir@ait.ac.th)

**Mr. Samuel Martin**

Research Associate  
Energy Field of Study  
School of Environment, Resources and Development  
Asian Institute of Technology  
P.O Box 4, Klong Luang, Parthumthani 12120  
Thailand  
Tel: +66 2 524 5423  
Fax: +66 2 524 5439/524 5419  
Email: [samuel@ait.ac.th](mailto:samuel@ait.ac.th)

**Mr. Sanjeeb K. Shakya**

Research Associate  
Energy Field of Study  
School of Environment, Resources and Development  
Asian Institute of Technology  
P.O Box 4, Klong Luang, Parthumthani 12120  
Thailand  
Tel: +66 2 524 5422  
Fax: +66 2 524 5439/524 5419  
Email: [sanjeeb@ait.ac.th](mailto:sanjeeb@ait.ac.th)

**Mr. Steve Kebasen**

Research Assistant  
Energy Field of Study  
School of Environment, Resources and Development  
Asian Institute of Technology  
P.O Box 4, Klong Luang, Parthumthani 12120  
Thailand  
Tel: +66 2 524 5422  
Fax: +66 2 524 5439/524 5419  
Email: [steve.kebasen@gmail.com](mailto:steve.kebasen@gmail.com)

**Dr. I. M. S. Sathyaprasad**

Senior Research Specialist  
Energy Field of Study  
School of Environment, Resources and Development  
Asian Institute of Technology  
P.O Box 4, Klong Luang, Parthumthani 12120  
Thailand  
Tel: +66 2 524 6582  
Fax: +66 2 524 5419/5439