



# GrIPP-Net News

A quarterly Newsletter of the EC-ASEAN Green Independent Power Producers Network  
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## Editorial

Efficiency improvement, cost reduction and high reliability have contributed to the expansion of photovoltaic (PV) globally. Around the world there are many projects utilising PV in such diverse climates, cultures and economies. For example Germany is powering 2000 homes and US Department of Energy sponsoring a rural electrification project in Brazil for 500,000 homes. There are 100,000 families in rural developing countries of Dominican Republic, Kenya, Sri Lanka and Zimbabwe, all using PV power for lighting, radio and television. Since 1988, Indonesia has led the way among the developing countries in the installation of PV. The country has tens of thousand villages scattered throughout the thousand of islands with no electric service. It is estimated that 8,000 PV systems were installed and more than 100,000 people are being served by the system (*PTM report, 2004*)

In view of the ever increasing significant role of PV towards sustainable energy development across the world, this second edition of the GrIPP Net Newsletter will focus on this issue. Hence, the newsletter will give an important overview of the PV technology situation in Southeast Asia as well as in Europe.

For an update, we are pleased to announce the First National Workshop with theme "*Update on the Development of Green IPPs in Thailand: Challenges, Strategies and Case Studies*" is now confirmed to be conducted in Bangkok, Thailand on 10 August 2005. The Regional Workshop is also scheduled from 15 – 16 September 2005 in Karlsruhe, Germany.

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The workshops in general shall provide a platform for discussion and knowledge sharing for players in the energy market who are interested in renewable energies systems and policies. Throughout the workshop, discussion sessions shall offer all participants ample opportunities to exchange opinions on the applicability of these experiences and possible success factors in a broader context.

## Upcoming Event

### EC-ASEAN Green IPP Network National Workshop

*"Update on the Development of Green IPPs in Thailand: Challenges, Strategies and Case Studies"*

10 August 2005, Bangkok, Thailand

#### Opening Session (08:00 – 09:30)

- Welcome/Opening Remarks: MOE, MONRE, CEERD-FIHRD

#### Session 1 (10:00 – 11:30)

Keynote Presentations: Update on Policy Instruments and Regulation in Thailand

- **Presentation 1:** An Overview on Renewable Energy Strategy, Policy, and Action Plans – MOE (EPPO)
- **Presentation 2 :** CDM Policy – MONRE

#### Session 2 (11:30 – 12:30)

Keynote Presentations: Update on Renewable Energy Technologies and Resources in Thailand

- **Presentation 3:** An Overview on Thailand Renewable Energy Technologies and Resources – MOE (DEDE)

#### Session 3 (13:30 – 16:30)

Project Structures and Financing Approaches in Thailand

- **Presentation 4:** Overview of Project Structure and Financing of Renewable Energy Projects in Thailand

- **Presentation 5:** Case Study on Small and Very Small Power Producers Projects (SPP and VSSPP)
- **Presentation 6:** CDM Projects Implementation: Case Study AT Biopower, Korat Waste-to-energy project, CDM projects by UNESCAP, CDM projects by Danida and/or Energy for Environment Foundation
- **Presentation 7:** Cogeneration Projects Development: Case Study on some of the cogen projects in Thailand
- **Presentation 8:** Developers' perspective of future renewable energy project development (presentation by a project developer)

### Closing Session (16:30 – 17:15)

### Discussion and Conclusions

## Solar Power in Europe

In 2003, installed PV power capacity in Europe increased by 26% to approximately 866 MW<sub>p</sub>. Germany took the lion share in this development and has also about half of Europe's installed capacity.

Table 1. PV power (MW<sub>p</sub>) as of the end of 2003 in selected countries.

Country	Total installed capacity	Installed in 2003
Austria	46	6
Denmark	2	0.3
Finland	3	0.4
France	21	2
Germany	410	133
Italy	26	4
Netherlands	46	20
Norway	7	231
Portugal	2	0.4
Spain	28	8
Sweden	4	0.3
Switzerland	21	1.5
UK	6	2
Japan	856	223
US	275	63
India	83	16
China	58	10

In terms of installed capacity per capita, Japan is also world leader with 7 W<sub>p</sub>/cap, followed by Germany (5), Switzerland (3) and The Netherlands (3).

Applications of PV power systems can be divided into:

*Off-grid domestic:* typically about 1 kW, providing power to households and small villages; economic alternative for extending existing grids more than 1 or 2 km;

*Off-grid non-domestic:* provide electricity to a large range of applications, such as telecommunication, water pumping, navigational services and vaccine refrigeration;

*Distributed grid-connected:* often integrated into the built environment (residential, commercial or industrial) and typically 1 - 100 kW<sub>p</sub>; power can be fed back into the grid when supply exceeds demand;



70 kW<sub>p</sub> roof system at Geneva exhibition centre

*Centralised grid-connected:* used as an alternative to conventional power generation or for strengthening the utility distribution systems; demonstration plants up to 6.5 MW are installed across the globe.



Solar plant in South-Australian desert

Distributed grid-connected PV application take up the largest share of the installed capacity in most countries, except for Scandinavia, Portugal and Switzerland, where off-grid systems dominate PV capacity. Development of domestic vs. non-domestic systems varies, depending on country circumstances.

Approximately 438 GWh (0.01% of total demand) was generated by PV in Europe in 2003. It has been shown that performance of newer systems, installed after 1996, is significantly better than older ones. The performance ratio accounts for losses due to shading, battery storage, inverters and wiring. Typical values for new systems are 0.75-0.80; for older ones about 0.1 lower. The spread in PR is however striking in all cases: from 0.4 to 0.9.

### Reference

IEA, 2004. *Trends in photovoltaic applications. Survey report of selected IEA countries between 1992 and 2003. Report IEA-PVPS T1-13:2004. www.iaepvps.org*

## PV in ASEAN

ASEAN countries harbour a huge potential for application of PV power. Climatic conditions are favourable with high solar influx throughout most of the year. Most of the countries have remote regions or islands that are often unelectrified and costly to be connected to the grid.

Solar home systems and small to medium PV power plants for remote villages and niche applications such as hospitals, water pumps, communication and service buildings provide for ample solar development opportunity. In these remote areas solar power is often a competitive alternative to conventional power supply.

Currently, the PV market is picking up in some countries, on the back of active support policies. Thailand for example, supports rooftop systems with a 50% grant. The Philippines has been the field of tens of bilateral aids projects for various PV Solar applications (EIES, PRES, SPOTS, MSIP, AMORE, Pangan-An, Palawan and Shell-RESCO). Barangay Electrification programme capitalises about 600 PV Solar Charging Stations with more than 1000 SHS and 300 hybrid systems installed. Beside Off-grid PV

electrification, the Philippines is also experimenting the first large PV power plant (1 MW) connected to the power grid in combination with a hydro scheme (7 MW).

One of the most attractive applications of PV technology is the use of PV in buildings or commonly known as Building Integrated Photovoltaic or BIPV, of which Malaysia plans to pursue in the next 5 years with the implementation of the Malaysian Building Integrated Photovoltaic (MBIPV). With this, the scope of PV applications is expected to increase in the country in the near future. The MBIPV project under purview of Ministry of Energy, Water and Communications aims to create the enabling environment that will lead to a sustainable BIPV market in the country and technology cost reduction. Malaysia expected to have the total installed grid-connected PV capacity of 2MWp by the time project ends.

*Installed PV capacity (MW<sub>p</sub>) as of end 2003 in selected ASEAN countries*

Country	Installed capacity
Indonesia	28
Philippines	1.5
Thailand	6
Vietnam	5.4
Malaysia	2.2



*Small PV power installation in Vietnam*