IEA INTERNATIONAL ENERGY AGENCY

17

PV POWER

Newsletter of the IEA Photovoltaic Power Systems Programme

DECEMBER 2002

Contents

Big steps for photovoltaics: inside we look at a variety of international developments – including a new PVPS initiative – which could have major impacts on the future of PV, particularly in the urban environment.

THE FRUITS OF PVPS' LABOURS

With the completion of Task 7, the IEA-PVPS activity focused on PV use in the Built Environment, a number of reports summarising the results of the group's work has recently been published.

BUILDING INTEGRATED PHOTOVOLTAIC POWER SYSTEMS – GUIDELINES FOR ECONOMIC EVALUATION

Robust economic analysis procedures are essential for fair evaluation of the long-term viability of capital-intensive BIPV systems. This report (IEA-PVPS T7-05:2002) undertakes an assessment of common economic evaluation methodologies to identify those most appropriate to PV. In order to derive valid results, it is important that all costs and benefits attributable to the system are reflected in the economic model, so this study presents a broad range of cost and benefit parameters, providing international examples where possible. It includes consideration of environmental, educational and thermal benefits, benefits to utilities, effects of incentive programmes, power quality, metering, shading, security and multiple building functions, plus evaluation of the costs of the system related to components, installation, interconnection, regulations and maintenance. Given the diverse and rapidly developing market, the report does not give definitive costs and benefits, but instead reflects an extensive list of valuable data relevant for an economic analysis.

MARKET DEPLOYMENT STRATEGIES FOR PV IN THE BUILT ENVIRONMENT – AN EVALUATION OF INCENTIVES, SUPPORT PROGRAMMES AND MARKETING ACTIVITIES

Market penetration of decentralised grid-connected PV systems has increased tremendously world-wide over the last decade, brought about by a wide variety of promotion strategies and dissemination programmes.

Beginning with an analysis of PV customers and types of dissemination strategies, this report (IEA-PVPS T7-06:2002) goes on to examine specific government target programmes – both voluntary and mandatory – that have been employed around the world. Incentives such as rebates, soft loans and tax benefits as well as strategies based on regulated prices and financial incentives for investors are described. Green power tariffs, solar stock exchanges and green power marketing are also considered, as are NGO strategies, retailer alliances and public building programmes.

Amongst a range of findings, the study highlights affordability as the customers' key concern, as opposed to a necessity for long-term cost-effectiveness. It also indicates that willingness to pay for PV is generally higher than programme designers anticipate. In conclusion, eight key factors for successful dissemination strategies are provided.

RELIABILITY STUDY OF GRID CONNECTED PV SYSTEMS – FIELD EXPERIENCE AND RECOMMENDED DESIGN PRACTICE

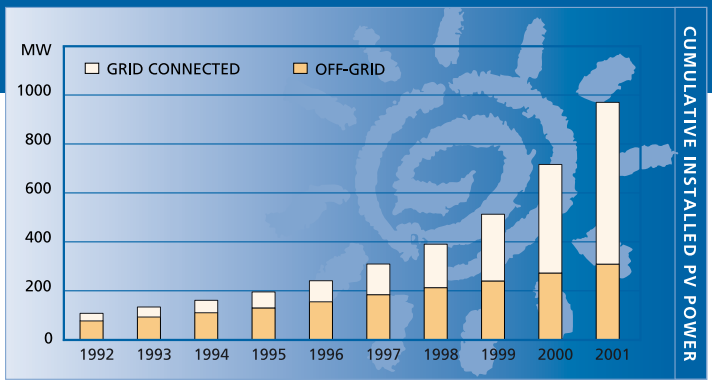
Following an IEA survey on faults, failures and poor performance of mainly residential PV installations across 11 countries, this report (IEA-PVPS T7-08:2002) demonstrates a 'learning curve' of decreasing failure rates. The failure analysis leads to recommendations for good design and installation practice and improved junction boxes. The use of modern Class II components can remove the need for string diodes and string fuses, giving simpler and more reliable systems. Minimum maintenance recommendations include yearly array inspections, regular array cleaning if there is soiling, and monthly electrical production checks.

Cited reasons for low yield in the German 1000-Roofs programme include over-rated modules, faulty DC connections, shading and soiling. Inverters still prove to be the weakest component, but have matured remarkably, with recent projects showing trouble-free operation for 10 years and some good rapid replacement services operated by manufacturers. Standard PV modules have reached a high quality standard.

Ordering details for these and other recently published reports are given on the PVPS website: www.iea-pvps.org

The reports produced as a result of Task 7's research should assist the development of many more PV projects in the built environment.
[PHOTO: BEAR ARCHITECTEN]

10TH ANNIVERSARY APPLICATIONS SURVEY



IEA-PVPS has now been compiling its International Survey Report (ISR) series 'Trends in Photovoltaic Applications' for a full decade. The ISR covering the period 1992-2001 is now available.

INSTALLED CAPACITY

The ISR summarises trends in installed PV power for the 20 PVPS reporting countries across four application areas (off-grid domestic, off-grid non-domestic, grid-connected distributed and grid-connected centralised). Market expansion between 2000 and 2001 maintained the high rate of growth witnessed in recent years, rising 35 % to 982 MW installed by the end of 2001. Japan and Germany alone account for 79 % of the increase – virtually identical to the previous year.

This further increases Japan's lead in installed power per capita to 3,6 W, and also increases the proportion of PV capacity connected to the grid, now 68 %, up from 62 % in 2000.

MODULE PRODUCTION AND PRICES

Module production rose more than six-fold between 1993 and 2001, with around half of cell and module production now located in Japan. Production capacity utilisation remains low at about 60 %, reflecting problems due to immature supply chains in a rapidly expanding industry, but most manufacturers report plans for expansion.

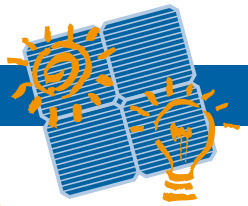
Following reports of slight price increases in 2000 when certain subsidy and support schemes resulted in high demand for components, system prices have regained their previous downward trend. Grid-connected BIPV systems of 1-3 kW typically cost between 6 and 12 USD per watt installed, but prices below 5 USD have been reported in Denmark, Germany, the Netherlands and USA.

PERCEPTIONS & SUPPORT MECHANISMS

PV demonstration projects are included in educational facilities in at least half of the reporting countries. The public perception of PV and recognition of its role in meeting sustainability objectives have noticeably increased over the past year. The Kyoto protocol has been one of the key indirect policy issues, stimulating reappraisal of renewable energy policy. At the current time 'carbon taxes' introduced in a number of countries are too small to noticeably affect the economics of PV, while market-led renewable energy schemes promote the cheapest option so do not necessarily lead to more PV installations.

The report (IEA-PVPS T1-11: 2002) is available from the PVPS website, www.iea-pvps.org, or from your national newsletter representative (see P7). If you would like more in-depth country-specific analysis, please visit the website where you are now able to download the individual national survey reports from which the ISR is compiled.

IEA

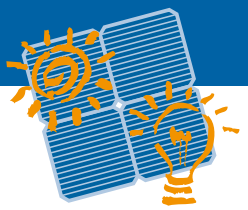


PLANNING FOR URBAN-SCALE APPLICATIONS

The format of the proposed new IEA-PVPS Task 10 dealing with Urban-scale PV Applications is gaining definition following a recent workshop in Rome to conclude Task 7.

The new initiative sees PV as one part of an holistic approach to future urban energy planning, aiming to maximise energy efficiency and use of appropriate renewables. Adoption of sustainable design principles, particularly in new urban developments is increasingly common, but to deliver this holistic vision on a broader scale involves a wide range of stakeholders with different skills and roles; from architects and planners to financiers, builders, the utility sector and of course PV and other energy technology specialists. Task 10 aims to achieve this through five activities focusing on planning, design and development, technical issues, economics and institutional factors, development and dissemination of targeted information products and the whole of PV R&D activities.

The Rome workshop highlighted the need for focused research that addresses the interdisciplinary needs, and in particular emphasised the importance of 'soft' (i.e. non-technical) issues. Transparent market information is vital, as well as better information on the workings of different support mechanisms, such as feed-in tariffs, green certificate trading, and investment schemes. On the technical side a key consideration is the quality of the PV system that the end-user sees. The new task aims to develop information products that improve quality assurance, and will cooperate closely with the ongoing PVPS work on operational performance and system design (Task 2), in relation to reliability issues, energy service guarantees and maintenance. The new task will also integrate and translate to urban-scale applications the knowledge gained through the previous PVPS work on PV in the Built Environment and Grid-Interconnection Issues. For further information contact Harry Schaap, ESAA, Fax: +61 (0)3 96 70 10 69



MAPPING FUTURE DEVELOPMENTS

Since the US industry released its plan for PV development to 2020 at the end of 1999, there has been a proliferation of PV roadmapping activities. The Japanese PV Energy Association (JPEA) has just completed its ambitious industry vision up to 2030. In Europe, perhaps reflecting the difficulties of numerous national interests and approaches, there are no less than four key mapping initiatives underway. Below we provide a brief snapshot of the studies and their salient points.

USA

Aiming to ensure US industry leadership over foreign competitors, the *20 year industry roadmap* is a framework for strategic plans and investments in PV technology and business. The US industry is ultimately seeking to attain technological leadership, achieve competitiveness with conventional technologies, maintain sustained market growth and make the PV industry profitable and attractive to investors. The roadmap assumes a 25 % annual growth rate in US manufacturing capacity in order to deliver 15 % (equivalent of 3,2 GW) of new peak generating capacity expected to be required in the US in 2020. Unlike the other regional roadmaps which see 'domestic' markets as the key driver for industry growth, the US plan sees non-domestic markets as important for near-term expansion of the US industry.

Home markets become more important in the longer term as prices for PV systems fall towards the 2020 prediction of 1,5 USD/W.

Contact: www.nrel.gov/ncpv

JAPAN

JPEA's 'Vision for a Self-Sustainable PV Industry' released in June uses the national government target of 4,82 GW installed capacity in 2010 as a key benchmark, driven largely by residential demand. The assessment sees national PV production of 1 230 MW in 2010, 67,5 % of which is destined for the housing sector.

Further benchmarks are a production of 4 ,3 GW per year in 2020, rising to 10 GW, an installed capacity of 82,8 GW, and a market value of 2,25 trillion JPY (18,7 billion USD) in 2030. By this time, the residential sector market share will have diminished to 28 %, while industrial and export markets will each account for a quarter of the market. Annual sales to the utility sector are predicted to expand from 20 MW in 2020 to 1,2 GW (12 % of the total annual market) in 2030.

Contact: Osamu Ikki, Resources Total System. Fax: +81 (0)3 3553 8954

EUROPE

The European Renewable Energy Centres Agency *'Future R&D in Photovoltaics'* presents short (to 2005) and medium (to 2010) term goals for PV components and system efficiency improvements and cost reductions. It identifies six main barriers that must be overcome to increase uptake of PV technology world-wide. Key amongst these are the need for system price reductions, resolution of silicon feedstock issues, continued development of thin-film technology and alleviation of energy storage problems. EUREC outlines an R&D roadmap to address the problem areas and achieve cost and efficiency goals. Various complementary fiscal initiatives and improved product marketing measures are also identified.

Contact: EUREC Fax: +32 (0)2 502 92 84

PVNET aims to increase the vitality and competitiveness of European industry, by identifying and prioritising key R&D issues and encouraging cross-fertilisation between PV and other innovative technologies.

Cystalline silicon is seen as the dominant technology for the foreseeable future, but investment to overcome silicon feedstock concerns is an important priority. Production innovations such as thinner wafers and high throughput sheets (as opposed to discrete cells) are expected to come on line between 2005 and 2007. Thin film development – critical if longer-term price predictions are to be achieved – will prioritise issues such as high-throughput deposition and improved encapsulation over the next four to five years, with low-cost substrates making an impact towards the end of this decade. Contact: www.pv-net.net

PV-EC-NET, Supported by the EC, sees fourteen European countries undertaking a benchmark analysis of National Research and Technological Development (RTD) Programmes, and a SWOT analysis for Europe as a whole and for individual nations. The benchmark shows wide variation in vision, targets and approaches of national programmes, ranging from ambitious targets for stand-alone systems to a focus on large-scale grid-connected projects, and from support mainly for R&D to focus almost entirely on demonstration. Many countries show strong positions in cell research, decentralised systems and system applications, but weaknesses in implementation and marketing. PV-EC-NET will deliver a policy-based European PV RTD roadmap, harmonising common development measures during 2003.

Contact: Job Swens, Novem,
Fax: +31 (0)30 2393744

To be published early in 2003, the *Industrial Roadmap for Solar Electricity* from the European Photovoltaic Industry Association (EPIA) focuses on industrial, technical and investment options over the next decade. In this context it considers crystalline silicon technologies, thin-films, and issues relating to marketing, sales and systems technology, including a series of priority actions for each area. The political message of the roadmap is an emphasis on the urgency of major investment for achieving high growth targets set for 2010 and beyond, such as 3 GW of installed capacity in Europe and factory module prices below 2 EUR/W. EPIA sees a stable policy environment – including rate-based incentives Europe-wide – continued focused RTD and a European export promotions agency as key tools for meeting these goals.

Contact: EPIA, Fax: +32 (0)2 468 2430

ADDED IMPETUS FOR PV IN EUROPE

The EU ratification of the Kyoto Protocol and the internal 'Green Energy' Directive – targeting the production of 22 % of electricity from renewable energy sources by 2010 – are significant drivers for development of RE projects throughout the EU. Wind, bioenergy and hydropower will be critical for achieving these targets, but a growing number of countries are now responding to these commitments by increasing applications of PV as well.

FINLAND

Within the Finnish National Climate Strategy to address Kyoto protocol commitments, concrete goals for PV are established under the national 'Action Plan for Renewable Energy Sources'. The Plan, which was launched in 1999 aims for 40 MW of PV to be installed by 2010, with a prognosis of 500 MW by 2025. A series of actions to enable the ambitious goals to be achieved has recently been defined, including preparation of a national roadmap. The main emphasis is on PV in buildings, though stand-alone systems and support for Developing Countries are also addressed. Subsidies of up to 30 % of investment costs have been available for community and commercial PV installations on new buildings for a number of years, but this is likely to be extended to private individuals in the near future and the subsidy ceiling raised to 40 %, the same as is available for wind energy investments.

An engineer completes installation of the first domestic systems approved for funding under the UK's MDP. [PHOTO: SOLAR CENTURY]

FRANCE

In addition to the subsidy and tax exemption measures that have resulted in approximately 14 MW of PV installed off-grid in mainland France and the French Overseas Departements since 1992, a new five year dissemination project for building integrated, grid-connected systems (BIPV) has recently been launched. The initiative aims to install 20 MW of BIPV by 2006, through a subsidy of up to 80 % combined with a rate-based incentive.

Roof-integrated systems of 1-10 kW, or larger-scale building systems of up to 100 kW are eligible for a maximum subsidy of 4,6 EUR/W within France or 6,1 EUR/W in the overseas Departements. The French Ministry of Industry has further recommended a 0,15 EUR/kWh preferential buy-back tariff be applied in metropolitan France and 0,30 EUR/kWh in the dependencies.

PORTUGAL

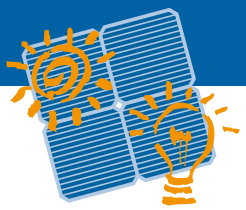
Under the EU Directive, Portugal has to aim to deliver 39 % of its electricity from renewables by 2010. In common with its neighbour, Spain, wind will form the bulk of the new installed power (3 000 MW) over the next 8 years. But within the 'E4' programme (Energy Efficiency and Endogenous Energies), launched in 2001, PV's contribution is set to increase from the current level of about 1 MW to 51 MW by the 2010 deadline. Recently revised legislation has established a range of favourable feed-in tariffs to maintain development of well-established technologies like wind and small hydro and support introduction of new ones such as PV, biomass and wave power. For PV the new buy-back rates of 0,28 EUR/kWh (systems over 5 kW) and 0,50 EUR/kWh (systems under 5 kW) make PV investments considerably more attractive than the former tariff (0,06 EUR/kWh). Grants in the range of 20 % to 40 % of the total eligible costs for renewables and energy efficiency projects are also available. The level of support is assessed on the basis of energy and environmental value.

UNITED KINGDOM

The UK has seen a step change in PV activity thanks to a series of demonstration 'Field Trials' in the residential and large-scale building sectors and the launch of the Major Demonstration Programme' (PV MDP) in May. The first phase of the MDP has a budget of 20 million GPB (30 million USD) over three years which is expected to result in a ten-fold increase in the number of domestic PV installations in the UK by 2005. Maximum assistance of 50 % of installed costs is available on systems in the range of 1-5 kW for homeowners and small/medium enterprises, while public sector and commercial customers can apply for 65 % and 40 % respectively on systems up to 100 kW. Currently funding is restricted to grid-connected systems.

A requirement of the scheme is that both modules and inverters be 'approved'; likewise installations must be undertaken by accredited installers.

Contacts:
France: André Claverie, Ademe
Fax: +33 (0)4 93 95 79 87
Finland: Leena Grandell, Motiva
Fax: +358 (0)9 8656 3199
Portugal: Pedro Paes, Labelec, S.A.
Fax: +351 21 941 92 54
UK: www.solarpvgrants.co.uk



IN BRIEF

JAPAN'S PV SUBSIDY – SAFE FOR ANOTHER YEAR?

The Japanese residential PV subsidy programme, originally planned to end in March 2003, looks set to continue, albeit with a significantly reduced budget.

With 290 MW installed under the scheme since 1997, the rooftop PV dissemination programme has been the biggest single market driver for PV to date, doing much to stimulate a stable demand that has given confidence for manufacturing investments worldwide. It has also served to reduce system prices in Japan by some 25 % over the last five years. Nevertheless, system prices remain beyond the financial means of most of the population, so termination of the programme without any follow-on and the loss of annual sales of 115 MW would be a severe blow for the Japanese and broader industry.

The Ministry of Economy, Trade and Industry has requested 10,5 billion JPY (87 million USD) for the 2003 fiscal year, down over 50 % from the budget of 23,2 billion JPY in fiscal year 2002.

Funds have been diverted instead to new PV R&D programmes focusing on field testing new technologies and developing systems for accelerated dissemination. There is also a significant – 3 billion JPY (25 million USD) – increase in the budget request for centralised grid-connected demonstration systems.

Contact: Osamu Ikki
Fax: +81 (0)3 3553 8954

90 MW BY 2010 FOR SOUTH KOREA

South Korea is finalising the design of its 30 000 rooftop programme which is expected to deliver 90 MW of grid-connected PV between 2004 and 2010.

The 330 billion KRW (275 million USD) initiative is likely to consist of a 20 % subsidy on installed costs of residential (3 kW) systems, coupled with a preferential tariff for (part of) the electricity fed into the grid. The buy-back rate for up to 30 % of the generated power is 716 KRW/kWh (0,59 USD/kWh), which is fifteen times more than the average electricity trading price.

PV industry development activities are currently focusing on optimising 3 kW systems in time for the programme launch in 2004, with help from a 7,3 billion KRW (6 million USD) injection from the Ministry of Commerce Industry & Energy.

Contact: Kyung-Hoon Yoon
Fax: +82 (0)42 86 03 739

CANADIAN BOOST FOR NOVEL TECHNOLOGY DEVELOPMENT

After several false dawns and over ten years R&D, a new solar technology has entered pilot production in Canada, with assistance of 29,5 million CAD (18,8 million USD) investment from Technology Partnerships Canada and the Climate Change Action Fund.

The conditionally repayable loan will assist Automation Tooling Systems Inc. (ATS) to develop its Spheral Solar™ technology and construct a prototype 20 MW per annum manufacturing line.

The Spheral Solar cell is a lamination of two sheets of aluminium foil encapsulating tiny silicon beads. Each bead is a minute single crystal cell while the foil sheets are the contacts. Initially the new technology should halve the specific silicon material requirement compared to a standard thick-crystalline solar cell.

Additionally, the production process uses no rare materials (such as silver solder) and there is a minimal waste material stream.

Sheets of spheres can be made to any size or shape, are flexible and light weight, and have the potential to greatly reduce module manufacturing and array support structure costs. They offer great scope for new building integrated PV markets.

Production from a Canadian pilot line is already underway providing 150 x 150 mm cells for testing and demonstration. A new plant in Cambridge, Ontario, is expected to start production of full-scale cells (600 x 150 mm) with a cell efficiency slightly over 10 % at the end of 2003.

Contact: Per Drewes at Sol Source Engineering, Fax: +1 905 898 1668.

INTERNET RESOURCES

CADDET

The IEA's Centre for Analysis and Dissemination of Demonstrated Energy Technologies is an international information network that helps managers, engineers, architects and researchers find out about renewable energy and energy-saving technologies that have worked in other countries. The 'InfoStore' is CADDET's fully searchable database of demonstration projects, containing detailed information on over 2000 full-scale energy projects from around the world. This site offers a free electronic news service; 'E-nnouncements' is a monthly bulletin for the energy and environmental community covering both CADDET (energy efficiency and renewable energy) and GREENTIE (greenhouse gas mitigation technologies). **www.caddet-re.org**

RETSCREEN

This site has been around for a while, providing access to the excellent RETScreen Renewable Energy Project Analysis Software, which is now being used by more than 25 000 people in 196 countries around the world. The software can be used as an early feasibility tool to evaluate the energy production, life-cycle costs and greenhouse gas emission reductions for various types of renewable energy technologies (RETs) worldwide. The site now also includes a number of other enabling tools for technical and financial evaluation of RE projects. All RETScreen resources are free of charge.
www.retscreen.net

SOLARACCESS

As the name implies, SolarAccess provides a convenient route to an array of renewable energy focused services, including daily news, online education resources a comprehensive events calendar and job opportunities. For individuals looking to locate suppliers of renewable energy products and services there is the renewable energy marketplace, as well as a classifieds section where companies (for a fee) can advertise their products. If you prefer news delivered to your mailbox, you might appreciate the free weekly renewable energy news e-mail bulletin, or for the real information junkies a daily news service is available for 89 USD annual subscription.
www.solaraccess.com

PVPS NEWS

DEVELOPING COUNTRIES WORKSHOP

IEA-PVPS Task 9 held a workshop for the Swiss Agency for Development and Co-operation (SDC) and the Swiss State Secretariat for Economic Affairs (SECO) in St Gallen on October 4th, 2002.

The workshop, which attracted nearly 50 participants from Task 9, SDC, SECO and the Swiss PV industry, was opened by Stefan Nowak, Chair of the IEA PVPS Executive Committee. His presentation provided an overview of how PV relates to development and the millennium targets, while subsequent speakers focused on the realities of implementing PV programmes, addressing financing, quality assurance and infrastructure needs.

The papers from the workshop will be posted on the Swiss PV website www.photovoltaic.ch.

Task 9 is also co-organising a workshop for staff of the Asian Development Bank and other interested parties from Asia, such as ACE (the Asean Centre for Energy), to coincide with the 8th Task 9 Experts' meeting in Hanoi, Vietnam in March 2003. The event is being jointly organised with CORE (The Council for Renewable Energy in the Mekong Region). CORE and ACE between them have 11 member countries. It is anticipated that representatives from all of these nations will attend the Hanoi event.

Contact: Jonathan Bates
Fax: +44 (0)1256 392701

FINANCING SOLAR HOME SYSTEMS

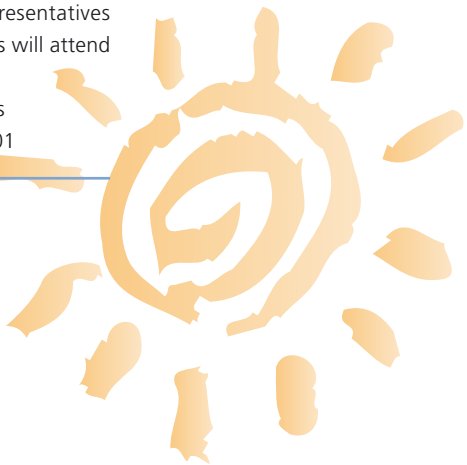
The lack of financial services for users of Solar Home Systems (SHS) is one of the main barriers to commercial PV dissemination.

Task 9 has recently published a Recommended Practice Guide (RPG) to assist the design of financial mechanisms for PV dissemination in developing countries.

The RPG highlights the need for carefully designed target-group-oriented financial services to speed up the dissemination of SHS. It argues that any financial services have to fit into existing financial structures in order to be sustainable and to avoid distortions. In particular, subsidies have to be designed carefully in a way that they are transparent, serve public interest and do not distort the market.

Operating costs of SHS are often underestimated. Thus, even with financing services in place SHS are not affordable for the poorest. The wealthier segments of the rural population appreciate SHS highly but it is in many cases not considered as a primary commodity.

The report is available for download via www.iea-pvps.org, the PVPS website.



DIARY DATES...

Workshop on European RTD Strategies & Cross-Fertilisation for PV, Ljubljana, Slovenia
12-14 February 2003
☛ Arnulf Jager-Waldau, JRC
Fax: +39 (0)332 789 268
www.pv-net.net

18th Photovoltaic Symposium Staffelstein, Germany
12-14 March 2003
☛ Leonore Nanko, Otti
Fax: +49 (0)941 29688 17
www.otti.de

NCPV Program Review Lakewood, Colorado, USA
24-27 March 2003
☛ Megan Maguire, NREL
Fax: +1 303 275 4320
www.nrel.gov/events.html

3rd World Conference on Photovoltaic Energy Conversion Osaka, Japan
11-18 May 2003
☛ Kosuke Kurokawa, Tokyo A&T
Fax: +81 (0)4 238 56729
www.wcpec3.org

Sustain 2003 Amsterdam, The Netherlands
13-15 May 2003
☛ Marc V. Sterel, RAI
Fax: +31 (0)20 549 1843
www.sustain2003.com

PVPS International Conference Osaka, Japan
19-20 May 2003
☛ Bernard McNelis, IT Power
Fax: +44 (0)1256 392701
www.iea-pvps.org

IEA-PVPS NEWSLETTER

NATIONAL NEWSLETTER CONTACTS

AUSTRALIA
Greg Watt
fax 02 9969 1364

AUSTRIA
Hubert Fechtner
fax 050 550 6390

CANADA
Gordon Howell
fax 1 780 484 3956

DENMARK
Peter Ahm
fax 86 93 36 05

EUROPEAN UNION
Rolf Ölström
fax 02 296 4288

FINLAND
Leena Grandell
fax 09 8656 3199

FRANCE
André Claverie
fax 04 93 95 79 87

GERMANY
Frank Stubenrauch
fax 02461 61 28 40

ISRAEL
Yona Siderer
fax 08 9431118

ITALY
Salvatore Guastella
fax 02 2125 5626

JAPAN
Osamu Ikki
fax 03 3553 8954

KOREA
Kyung-Hoon Yoon
fax 042 86 03 739

MEXICO
Jaime Agredano Diaz
fax 73 182 436

NETHERLANDS
Job Swens
fax 030 23 16 491

NORWAY
Bruno Ceccaroli
fax 38 11 9961

PORTUGAL
Pedro Paes
fax 21 941 92 54

SPAIN
Jesós Garcia Martin
fax 91 57 82 09 4

SWEDEN
Lars Stolt
fax 018 55 50 95

SWITZERLAND
Pius Hüsser
fax 062 834 0323

UNITED KINGDOM
Rebecca Gunning
fax 01256 392701

USA
Charles Linderman
fax 202 508 5600

PV POWER

PV Power is the newsletter of the IEA PVPS Programme.
It is prepared by IT Power under supervision of PVPS Task I.

Managing Editor: Bernard McNelis
Editor: Paul Cowley
Layout and production: De Boer & van Teylingen, The Hague, Netherlands
Office for correspondence: PV Power Newsletter, The Manor House, Chineham Court, Lutyens Close, Hants RG24 8AG, UK
E-mail: pvpower@itpower.co.uk
Website: http://www.iea-pvps.org

SHS IN NEPAL

CASE STUDY

PROJECT SUMMARY

- **Location: Nepal**
- **Programme: Solar Energy Support Programme (SSP)**
- **Funding: 90 % Danida Energy Sector Assistance Programme, 10 % Government of Nepal**
- **Installed: 15 000 solar home systems (SHS) since 1999**
- **Scope: 25 000 SHS during phase I**
- **Yearly inspection rate: 1 % of installed capacity**

Contact: Ivan Katic, SECD
E-mail: ivan.katic@teknologisk.dk

Nepal has had a network of PV systems suppliers operating commercially since the early 1990s, but quality has been a problem. In response, a quality assurance programme for solar home systems has been introduced with support from the Danish development agency, Danida.

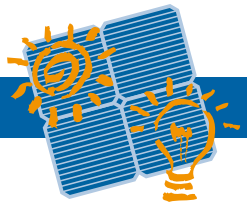
Very few qualified companies manufacture components locally, with many products imported from South and East Asia. The programme includes basic training and certification of installers, the introduction of minimum standards for BOS components and modules, and random inspections of installations. Promotional activities now stress the importance of quality.

These measures, together with diminishing subsidies – up to 50 % in the most remote areas – have resulted in steady sales growth to achieve 15 000 systems installed since the beginning of the support programme.

An independent national solar energy test station (SETS) has been established in Kathmandu with strong local involvement. It performs quality control measurements on components, as well as providing installer training and qualification assistance for Nepali manufacturers. SETS has now been in regular operation since summer 2001, using QA procedures based on those of PV-GAP and Solar Energy Centre Denmark. As one of very few PV testing labs in developing countries, it is a model for other PV support programmes.

SETS Technicians training on PV system design.

IEA



PVPS – ENTERING A NEW ERA IN OSAKA

To celebrate ten years of successful international collaboration under the IEA's Photovoltaics Implementing Agreement, IEA-PVPS will hold an International Conference in Osaka in May 2003. The event will review achievements to date and help define the future mission of the programme.

As can clearly be seen from PVPS International Survey Reports, there have been dramatic changes in the PV world since the programme was launched ten years ago. On 19-20 May 2003, immediately following the World Conference on Photovoltaic Energy Conversion (WCPEC-3), PVPS, with support from NEDO, will hold an International Conference in Osaka.

The two-day Conference will provide the opportunity for PVPS and invited speakers to share information and exchange views on PV policies and markets with important stakeholders from around the world. This will help shape future PVPS strategy.

A key topic of the Conference Agenda will be a discussion of the three PV Road Maps, independently developed by industry groups in Europe, Japan and the United States. This will be complemented by reviews of the vision developed by the G8 Task Force on Renewable Energy, and the outcome of the recent World Summit on Sustainable Development (WSSD). Participants will consider the role of policy measures, present and planned, in IEA member and developing countries, on the PV market which is in rapid transition.

The audience will include representatives from government, PV and utility industry, regional and national organisations from developed and developing countries, NGO's and consultants. Further details of the scope and agenda, and a Registration Form, are available from the Conference website: www.iea-pvps.org