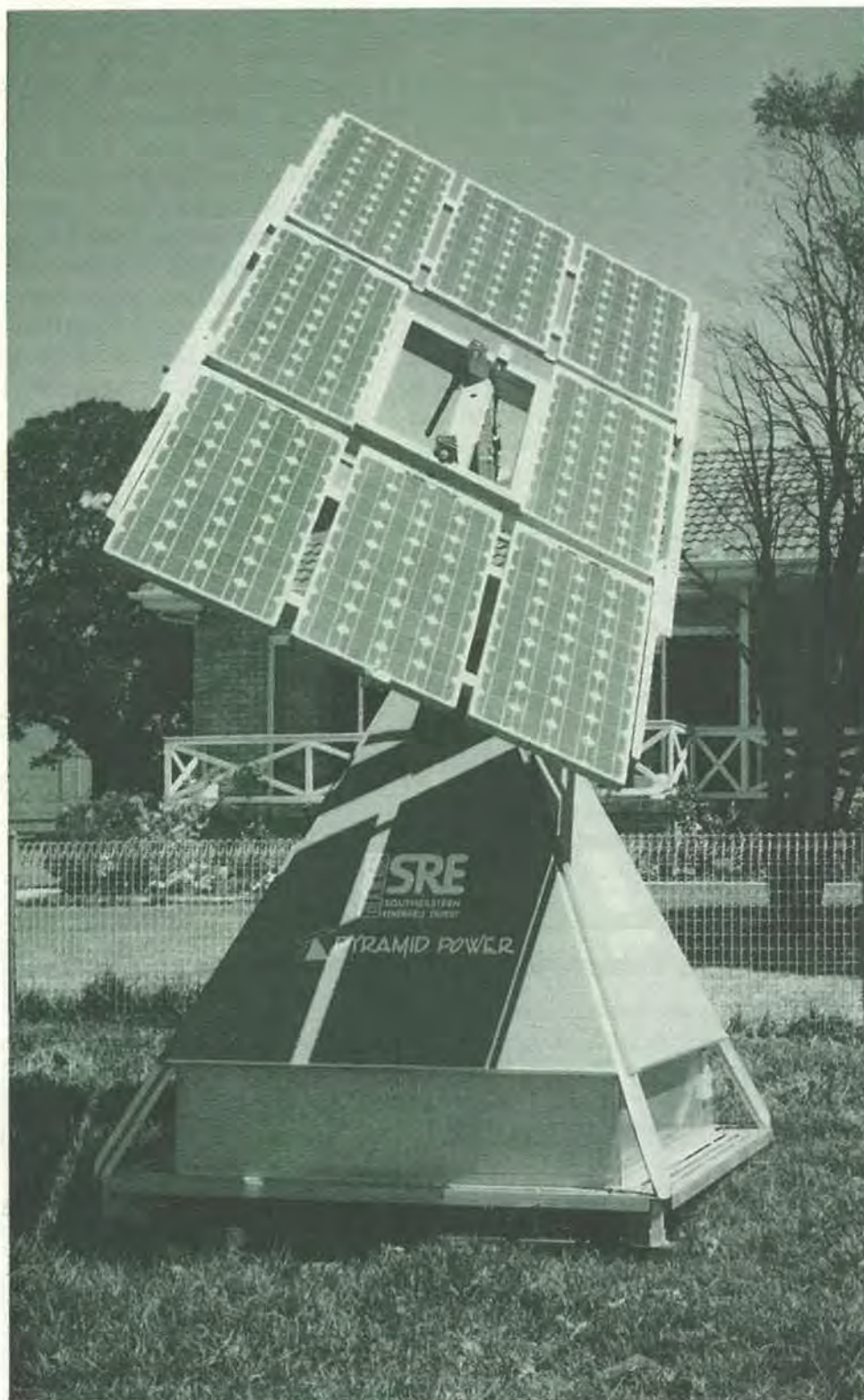


Sustainable Energy News

No. 12 March 1996

Newsletter for the
International Network
for Sustainable Energy

- INforSE



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Sustainable Energy News

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Solar Summit Needs NGO Experiences

Six months from now, people from all over the world will meet in Harare, Zimbabwe, for the Solar Summit and for the initiation of the Solar Decade (1996 - 2005), which will focus attention on solar energy, particularly on its possibilities for supplying energy to rural areas in developing countries.

Experience from all over the world demonstrates that the most successful decentralized solar - energy developments are found in community based projects, in contrary to "top-down" projects with little concern for local participation. These community experiences are so far not sufficiently visible in the World Solar Summit Process. So far, the top - down and market - driven approaches seem to be dominating, with little attention to national as well as local priorities and experiences.

NGOs working with energy and development should commit themselves to convey a different message to the Solar Summit. Solar energy development must take place in a way that integrates the social needs of communities and involves full local participation. Further, the roles of non - governmental and community based organiza-

tions in addressing the energy needs of the "poorer" segments of society need to be fully recognized and integrated in the World Solar Summit Process.

During an INforSE meeting in Harare on March 4 - 6, it was recommended that the 154 INforSE member organizations worldwide from now on maximise their attention to the World Solar Summit Process. INforSE coordinators and members should aim at organizing a series of regional consultative meetings. These meetings will be an important help to mobilize and sensitize NGOs, community- and village - based organizations, and the private sector in working towards the Solar Summit and the Solar Decade. It is hoped that this, together with the other activities planned by INforSE and its member organizations, will have a major impact on the Solar Summit. Only if the messages from the communities are fully recognized and integrated in the World Solar Summit Process and in the Solar Decade we can hope for a fruitful outcome of these events.

*Stephen Karekezi,
Masse Lo, &
Rene Karotki*

Solar Summit NGO Newsletter - Comments Welcomed

A special newsletter with NGO comments and concerns on the Solar Summit Process will be included as part of the next issue of Sustainable Energy News.

Please send inputs for the newsletter to INforSE, to N. Petringa or G. Olesen not later than May 15, 1996.

Front page:

Pyramid Power developed in Australia. The system supplies 240 volt electricity. It is part of a new concept for the future of remote area energy supply. See article on page No. 10.

Internet:

The Sustainable Energy News is on internet starting with issue No. 11: <http://solstice.crest.org/renewables/sen/index.html>. The Contact List will be there soon as well.

INforSE Coordinators' E-mail Meeting

The annual INforSE coordinators meeting took place as an e-mail conference from December 11 to January 15.

During this conference, proposals for the coming year's INforSE activities were presented by the coordinators and the Secretariat. The report of 1995 activities was discussed and adopted. Finally, the ac-

tion plan for 1996 was adopted. It was also decided to hold the 1996 INforSE Coordinators' Meeting in September in Harare, Zimbabwe in connection with the UNESCO World Solar Summit.

The outcome of the meeting is available on the electronic conference "energy.network".



INforSE Coordinators' Meeting '94.
On the photo: right to left, down to up M. Beaulieu, T.K. Mulik, B.Gertes; Ana Lucia Rovere, M. Mizuno, Nelson (FWD), Emil Bedi; Gunnar Olesen, Masse Lo, Asgar Garnak (Secr.) René Karotki, L. la Cour (Secr.). (see p. 20).

INforSE Action Plan 1996

In 1996, INforSE will work on the World Solar Summit, Multilateral Development Banks, and the UNESCO Fifth World Conference on Adult Education, as well as regional activities and a number of cooperating projects across the regions. To the existing exchange of information will be added increased use of e-mail and the Internet, as well as probably French and/or Spanish short versions of Sustainable Energy News.

World Solar Summit

The largest new activity will be participation in the UNESCO Solar Summit Process (WSSP). The objective of the INforSE activity in connection with the WSSP is that the social and environmental aspects of solar energy (renewable energy) development, and the comparative advantages of NGOs in addressing the energy needs of the poorer segments of the populations, be fully recognised and integrated into the WSSP and the Solar Decade. In these efforts, INforSE will focus especially on Sub-Saharan Africa.

Before the Summit, INforSE will:

- Review and comment on the 5 leading WSSP documents.
- Prepare and issue an NGO WSSP newsletter in May-June, in August, and three times during the Solar Summit.
- Prepare INforSE's proposal for inclusion as one of the WSSP strategic projects.

During the Summit, INforSE will:

- Organise workshop(s), press conferences, meetings, and other events.
- Lobby on contents of documents.
- Run an information stand presenting sustainable energy as an integrated part of environmental and social development.

After the Summit, INforSE will follow up regarding the Solar Decade and the proposed strategic project.

Multilateral Development Bank Monitoring Activities

Beside direct contact to the World Bank and other Multilateral Development Banks (MDBs), INforSE will cooperate with other NGO-networks to study the role of multilateral development banks in supporting renewable energies. This activity will, among others, focus on analyzing MDBs energy policies and their energy investments.

Adult Education

INforSE has been requested by UNESCO to participate in preparation of the Fifth World Conference on Adult Education, July, 1997, with a focus on the environment and on non-formal adult education.

The INforSE participation could consist of:

- Participation of INforSE-member organisations in 5 regional

preparatory meetings.

- Elaboration of proposals to reinforce existing networks and a series of regional information, awareness, and demonstration activities to strengthen NGOs in their efforts concerning the environment and adult education, and to bring together important actors from different sectors.

Other INforSE Activities

The distribution of the INforSE campaign paper "Energy for a Better Life" will continue via interested INforSE organizations.

Bilateral cooperation between regions will continue, with major emphasis on awareness and training programmes on renewable energy, presently in East Africa and Thailand. The possibilities of collaborating with South African NGOs will be investigated.

In addition, the INforSE regions plan a number of regional meetings, studies, projects, etc.

All INforSE member-organizations are hereby invited to participate in the activities. Please contact the Secretariat or your regional INforSE coordinator.

The full action plan is available from the secretariat or from the e-mail conference "energy.network".

The World Solar Summit - Harare, Zimbabwe, September 16-17, 1996



By *Nataschia Petringa, InforSE Secretariat, Denmark*

The World Solar Summit Process (WSSP) is on course and two events have already been carried out this year, and more than 11 will come.

NGO Involvement?

Yet, in light of the many activities mentioned herewith, the key questions of INforSE members seem to be:

- Are NGOs really involved in the World Solar Summit Process?
In theory, they should be. In practice, however, their involvement continues to be peripheral to the entire process. Information dissemination to NGOs on the WSSP has been sporadic and difficult to obtain.
- It appears that the WSSP has adopted a technical approach. Socio-economic factors surrounding renewables need to be taken into account more emphatically, and this is where INforSE members and other NGOs can contribute unique experience and know-how.

NGO Concern

Some additional issues about which NGOs are presently concerned are:

- Will the WSSP be able to achieve the objectives that it has set out to accomplish, or will the end-result merely be yet another blue-print?
- In addition, how much leverage will be given to NGOs in the selection and approval of strategic projects.

INforSE Activities

Three INforSE members, ENDA-Energie (Senegal), Biomass Users' Network (Zimbabwe), and the Foundation for Woodstove Dissemination (Kenya), in collaboration with the INforSE Secretariat, met in Harare (March 4-8) to discuss INforSE and other NGO involvement in the WSSP.

In particular, they aim to increase NGO representation at the actual Summit and plan to hold a series of activities before, during, and after the Summit.

One of the projects planned is a special WSSP Newsletter for NGOs on the WSSP. The objective of the Newsletter is to capture NGO views and concerns about the WSSP, as well as to suggest concrete ways to increase NGO involvement in the process. It is hoped that the WSSP Newsletter will positively influence the World Solar Commission and the WSSP Secretariat to acknowledge the critical role that NGOs play in creating awareness, compiling information, and providing training on renewables. The first issue of the newsletter will be included in the next issue of Sustainable Energy News

in June. Another important planned activity is the development of an INforSE programme and/or programmes, which hopefully will be accepted and approved for the World Plan of Action of the WSSP.

More info on INforSE activities in the WSSP: contact Rene Karotki or N. Petringa at the INforSE Secretariat, See address on page no.1.

Address of World Solar Summit Secretariat: UNESCO Engineering and Technology Division, att. Boris Berkovski & Richard Wyhn, 1 rue Miollis, 75732 Paris Cedex 15, France. Fax: +33-1-4065-9535, ph: +33-1-4568-3900.

1996 events of Solar Summit Process

- Asia and Pacific Solar Summit, Penang, Malaysia (15-19 January)
- Ad-Hoc Interagency Task Force on the World Solar Summit Process at the UNESCO Headquarters in Paris, France (29-30 January);
- WSSP International Organizing Committee (IOC) /Zimbabwe Organizing Committee (ZOC) preparatory meeting in Harare (26-27 February);
- High-level expert meeting on "Solar Energy and Fresh Water, Culture and Environment" in Muscat, Sultanate of Oman (23-26 March);
- 3rd meeting on the International System for Energy Expertise and Knowledge (ISEEK), at the UNESCO Headquarters in Paris, France (11-12 April);
- Constitutive meeting of the Regional Solar Council for Latin America and the Caribbean in San Jos, Costa Rica (6-10 May);
- Mediterranean Solar Summit in Valetta, Malta (20-24 May);
- World Renewable Energy Congress IV in Denver, Colorado, USA (15-21 June);
- WSSP/IOC Preparatory Meeting at UNESCO in Paris (30 June-1st July);
- World Congress of Engineering Educators and Industry Leaders in Paris, France (2-5 July);
- Moscow Solar Summit in the Russian Federation (8-12 July);
- High-level expert meeting on "Solar Energy in East and South-East Asia" in Akita, Japan (24-27 July).
- A WSSP IOC/ZOC Preparatory Meeting and a World Solar Commission session will be held two days and one day prior to the Solar Summit, respectively;
- World Solar Summit, September, Harare, Zimbabwe (16 - 17 Sept.).

INforSE asks all NGOs planning to participate in the Solar Summit events to keep contact with INforSE to exchange information on the process.

Energy Programmes in Multilateral & Bilateral Institutions

By Natascia Petringa,
INforSE- Secretariat, Denmark

The potential role of renewable/sustainable energy technologies for rural areas in developing countries must not be underestimated. It is well accepted that grid extension alone is not an economically viable way to meet the energy demands of remote areas in developing countries. Decentralized, new, and renewable sources of energy offer great opportunities to meet the energy needs of rural areas; however, renewable energy programmes comprise a small fraction of current multilateral and bilateral assistance programmes. This reality is clearly reflected in the following quote:

"This situation has led to a vacuum of authority and lack of guidance for energy interventions in rural areas, resulting in the scarce allocation of energy resources and a low level of energy investment for rural development".
(Bhagavan, M.R & Karekezi, S.1992).

Survey

In addition to investigating the funding mechanisms for renewable energy within the European Union (see last issue), the Forum for Energy and Development (FED) and INforSE have been preparing a report on the role of several multilateral and bilateral organizations operating in the field of renewables. The objective of this report, which is entitled "A Survey of Energy Programmes in Selected Multilateral and Bilateral Institution," has been to "screen" the existing energy programmes (particularly renewable energy programmes) of certain multilateral and bilateral institutions to identify new windows of opportunity for INforSE members. Briefly, the contents of the report consist of the following:

- Section II addresses the Global Environment Facility (GEF) and the Small Grants Programmes (SGP).
- Section III outlines the activities of the United Nations Development Programme (UNDP).

- Section IV presents the activities of the World Bank Group.
- Section V summarizes the activities of the United Nations Environment Programme (UNEP) and the UNEP Collaborating Centre on Energy and the Environment.
- Section VI of has been devoted to the World Solar Summit Process, launched by UNESCO.
- Section VII identifies other potential sources of funding for renewable energy projects. These include multilateral development banks, bilateral assistance/ODA sources, and private foundations.

The report may not have acknowledged every single renewable energy programme or "strategy" in the above-mentioned institutions. Rather, it is hoped that this report may serve some of the information needs of INforSE members and of other NGOs.

Opportunities for INforSE

In addition to the above mentioned survey, recommended "areas of opportunity" for INforSE member organizations have been synthesized in a shorter, more informal paper entitled "Recommendations and Areas of Opportunity for Forum for Energy & Development and INforSE Members".

The two reports will be available soon at the INforSE Secretariate. See address on page no.1.



Asia & Pacific Solar Summit

The Summit in Penang, Malaysia in January 1996, contributed the regional input to the five main documents of the WSS Process and conveyed the first meeting of the World Solar Commission.

In the Summit's Penang Declaration, the close link between economic and social development was recognized, as well as the relationship between renewables and environmental protection. Four strategic projects, were proposed including an Asian Pacific renewable energy education and training centre, and one model village for renewable energy electrification in each country.

More Info: Prof. K. Ibrahim, School of Physics, University Sains Malaysia, 11800 Penang, Malaysia, fax:+60-4-6579150, email kamarul@usm.my

Moscow Solar Summit

During the event in July 8-12, 1996, the Russian Federation and other CIS countries will define their contribution to the development of renewable energy and to the five leading documents of the Solar Summit Process.

The Summit will include two plenary on the Solar Summit Process and Documents, a plenary on renewable energy in CIS Countries, two specialized workshops and an exhibition.

It is organized by three Russian ministries, Russian Academy of Agricultural Sciences, a company, and Intersolarcentre. Participation fee is \$350.

More info: V.Dobrokhov, Intersolarcentre, 2, 11st Veshniakovskiy proezd, Moscow, 109456, Russia, ph/fax:+7095-17196701-1715101, email: energy@viesh.msk.su.

Regional News - Africa

Regional Programme of Renewable Energy Technologies (RETs) in Eastern & Southern Africa

By Timothy Ranja, AFREPREN/FWD, Nairobi, Kenya, *InforSE - Eastern Africa Regional Coordinator*

Non Technological Factors

Since the beginning of 1994, the Stockholm Environment Institute (SEI), in collaboration with AFREPREN/FWD, has been conducting a study of the non-technological factors influencing the dissemination of renewable energy technologies (RETs) in Eastern and Southern Africa. Six country case studies were conducted in Botswana, Kenya, Lesotho, Seychelles, Uganda, and Zambia. The case studies provide in-depth analysis of factors affecting solar, wind, biomass, and micro-hydro technologies. A Regional Report, which incorporates the findings of the country case studies, and a "Regional Directory of RETs Agencies in Eastern and Southern Africa" were prepared.

The findings of the Study reveal that institutional deficiencies, pricing distortions, and limited information on

renewable energy are the key barriers to the dissemination of RETs in the region. To address these barriers, the Study proposes:

- The development and application of carefully selected applied research and technological adaptation strategies;
- Initiation of long term renewable energy training and capacity building programmes;
- Institution of new and flexible financing mechanisms; and
- Implementation of aggressive and innovative long-term renewable energy policy programs.

Applied Research

As a follow-up to the Study, SEI and AFREPREN/FWD expects to collaborate closely with key research and manufacturing agencies that have demonstrated the capacity to participate in a Regional Programme of Applied Research. The research programme will involve close interaction with major existing and potential ac-

tors such as manufacturers, credit institutions, research agencies, and Government Ministries.

Training Programme

SEI and AFREPREN/FWD plan to launch a Training Programme on RETs for Eastern and Southern Africa. The objectives of this project will be to strengthen existing capacity and know-how of RETs in Eastern and Southern Africa.

The Project will draw from the findings of the Study on RETs to develop a detailed, tailor-made training multimedia package suitable for use in courses and/or as a module of established University and Polytechnic curricula in the region.

The target group includes university lecturers, development workers, and training managers in the region's renewable energy industry. The courses, which are expected to be taken by 20-25 participants from selected countries, will be held in locations where field visits can be organised.

Charcoal & Woodstoves

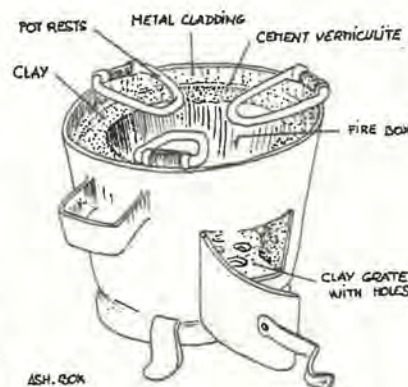
In Eastern Africa, the successful introduction of the Kenya Ceramic Jiko (KCJ) has already led to considerable energy savings in the households of the cities. These energy savings, in the form of reduced charcoal consumption, have reduced deforestation, as charcoal consumption is one of the larger causes of deforestation. It has also led to improvements of health, because it reduces emissions of particulates in the kitchen.

In rural areas, the KCJ is not much used because the traditional fuel is firewood, not the more expensive charcoal. Improved stoves made of clay can yield energy savings and improvements of air quality for firewood users, just as the KCJ does for charcoal users. Their introduction is impeded by a number of barriers, including:

- Firewood is free. Lower consumption will reduce the time that the women spend on gathering firewood, but does not earn money for the families.
- Lack of trained people has led to a backlash in some areas because badly constructed ovens have given a bad reputation among the users.
- Dissemination projects have not been coordinated, and have not drawn on the experience from previous projects.

These are some of the conclusions of the study of the Foundation for Woodstove Dissemination on the socio-economic benefits of using renewable energy. The study was supported by the Forum for Energy & Development, Denmark.

More info: FWD / InforSE East Africa



Kenya Ceramic Jiko (KCJ). The study of the Foundation for Woodstove Dissemination analyses the barriers to the dissemination of the successful KCJ and the improved stoves.

Small Hydro Power for Africa

By Stephen Karekezi, Timothy Ranja and Ottieno Francis, AFREPREN/FWD, INfoSE-East Africa

Renewable energy, with the exception of biomass, accounts for less than 2% of the total energy supply in Eastern and Southern Africa. The share of small hydro is even smaller. For example, in Zambia, the estimated potential for small hydro power is 45 MW, but only about 10% is exploited. The potential of small hydro vis-à-vis the decentralised energy needs of the rural population makes it an attractive option for meeting part of the future energy needs of the region. The capital requirements for small hydro constructions are generally lower than for conventional, centralised energy investments. The modular nature of small hydro technologies allows even the poorest countries of the region to begin a phased energy investment programme that does not strain their national financial resources or draw funds from other basic needs.

So far, investments in hydro power have concentrated mainly on large hydro dams. Many utilities prefer large centralised investments because they are considered easier to manage. In addition, it is more attractive to focus on large hydro schemes, which entail the disbursement of large loans.

Prospects and Barriers for Small Hydro Power

A number of obstacles have affected the dissemination of small hydro, including:

- limited access to information on small hydro, particularly pertaining to resource assessment;
- inadequate appreciation of the importance of active participation of local manufacturers/assemblers and end users in the dissemination of the technology;
- excessive emphasis on the service functions (e.g. lighting) at the expense of production oriented functions such as rural industries and entrepreneurial approaches.

Other issues that have received inadequate attention include the manufacture of equipment and spare parts for small hydro plants; maintenance of small hydro stations; training of users, maintenance personnel, and manufacturers; and involvement of entrepreneurs.

Moreover, the leverage and advantages that power utilities enjoy constitute an important institutional barrier to the dissemination of small hydro. A number of sub-Saharan African (SSA) countries have begun to address this problem by considering legal instruments that would facilitate independent and decentralised electricity generation, as well as sale to the grid.

Another important factor that could increase the use of small hydro would be the establishment of independent or autonomous rural electrification agencies, which could pursue rural electrification more vigorously than can be done by the existing power utilities. The dispersed and modular nature of small hydro power potential is in many respects alien to the culture of conventional utilities, which are more comfortable with the large-scale and centralised projects. In-

dependent rural electrification agencies, on the other hand, can be designed to cope with small-scale small hydro technologies that require active collaboration with local manufacturers and end users.

In addition, there are important economic and financial impediments to the dissemination of small hydro. High priority should be given to reducing the heavy import and sales taxes imposed on renewable-energy equipment.

The pricing structure of conventional large-scale energy systems also needs to be reviewed to ensure that energy prices reflect the long-term marginal costs and, wherever possible, incorporate the environmental costs associated with these systems.

Dissemination strategies that have demonstrated some success have involved participation, income generation, and small-scale enterprise development. The rationale is that if producers and distributors can make an attractive income from the manufacture and marketing of small hydro equipment and end users are fully involved in the dissemination process, then the issue of sustainability is resolved in a much more cost-effective fashion.

Small hydro technology dissemination initiatives can be a component of an existing integrated income-generating project or environment programme, of a rural industrial programme, or of a health extension programme.

Source: Renewable Energy for Development, Stockholm Environment Institute, Oct. 1995, AFREPREN/SEI Study. Shortened by the editors.

Oil in Ogoni Land

When Ken Saro-Wiwa was killed by the Nigerian government, protests rose worldwide against human rights violations in Nigeria.

Behind this is a long story on how a dictatorship and multinational oil companies have ruined the environment of Ogoni land by careless oil- and gas exploration, severely damaged the fishing and agriculture opportunities

as well as groundwater for the Ogoni tribe, and thereby reducing the livelihood opportunities for the Ogoni. These hidden costs of oil exploration in Nigeria are effectively passed on by the military government of Nigeria to the local tribes living in Nigeria's oil fields.

Many NGOs are urging that protests be made to the Nigerian Govern-

ment, as well as to Shell, for which Nigeria is the main oil-producing country.

Contact: DELTA (Network of NGOs and individuals working on the problems of Shell and oil-exploration in Nigeria) Princes Street, Oxford OX4 1HU, United Kingdom ph+44-1-865 791 391, fax+44-1-16 255 3223.

Renewable Energy Development in India

Excerpted from articles by Venkata Ramana, Chandra S. Sinha, and Ajit Gupta, published by TERI, India

New joint ventures, a concentration of international funding, financial incentives, and a new law drafted on National Renewable Energy show that India is gaining momentum in the realisation of its renewable-energy potential.

Not all Renewable Energy Technologies (RETs) are defensible purely on economic grounds yet, but environmental and social concerns, which are of equal importance in view of sustainable-development goals, make a case for their promotion in India.

Impressive Figures with Small Share

India will soon become the second largest wind energy producer in the world, and will have what could be the largest solar photovoltaic program including 1 million solar lantern, 50,000 solar pumps, 100,000 radio telephone system for villages. In addition, there are 2.2 million family-size biogas plants and 300,000 m² of solar collector area (see table).

Though the figures appear impressive in themselves, the contribution of renewable energy has been small (not accounting for direct bio-fuel use in the rural areas) in the overall energy mix in the economy. The main reasons for this:

- Compared to the conventional energy sources, except for a few biomass-based technologies, RETs have not been economically viable due to various technological and other constraints.
- Budgetary allocations for their promotion have been low. Even in the 'Eighth Plan' (1992-97), the renewable energy sector was allocated just about 0.8% of the total funds allotted to the energy sector.
- Lack of supportive laws and regulations.
- Lack of active linkage with the industry, both in R&D and in application, which would have brought private capital into the sector.

Rapid Growth Due to Commercialization

The last year's rapid growth in Indian renewable-energy programs has largely been due to economic liberalisation and to encouragement of the commercialization of renewable energy technologies. The MNES, Ministry of Non-conventional Energy Sources, which has been under the direct charge of the Prime Minister since 1992, has had a major role in making available financial incentives and physical targets. MNES adopted a comprehensive strategy and action plan for promoting RETs in India.

The financial incentives introduced are:

- 100 % depreciation allowance
- Soft loans offered by a separate agency (IREDA)
- Reduced customs duties on imported material & equipment
- Exemption from excise duty and sales tax
- Remunerative price for power fed into the grid
- Liberalised foreign investment procedures

The outcome of these efforts is already becoming visible in the area of power generation. Around the same time international funding in the form of World Bank and GEF assistance of nearly US\$ 200 million has also been approved to assist the commercialization of RETs, particularly wind, small hydro, and solar photovoltaics. Consequently, international organisations have shown interest in joint ventures with Indian counterparts to establish manufacturing facilities and technology transfer.

New Law Drafted

India's Government is to bring out a National Renewable Energy Policy and a legislation to make non-conventional energy more popular and demanded. The draft policy introduced by MNES is likely to be ready shortly.

The legislative reforms proposed by experts include:

- Regulatory mechanisms to help creating a demand for the technology e.g. mandating the use of solar water heating in public buildings.
- Including the options of demand-side management (DSM) and distributed utilities (with decentralized power generation, DU) in part of all power-related investment decisions. The approach should be one of integrated resource planning to ensure inclusion of cost-effective applications.
- Viable DSM options (e.g. solar thermal water heating systems, passive solar architecture) should be made mandatory in new public buildings and private houses constructed by public and private organisations.
- Tax should be levied on all private conventional power to fund research and development (R&D) work in DSM and DU in order to improve technology and reduce costs.
- Rural energy programs based on renewables should be given priority on a par with other social welfare programs to attract support. Licensing, land regulation, financial incentives should encourage the decentralised RET options.
- Rural energy programs should be integrated with other development programs to mobilise larger resources; e.g., biogas plants could be part of rural sanitation programs, rural housing programs could be paired with the improved cookstoves, and solar pumping system could be part of irrigation plants.
- Institutional mechanisms should be developed to support the law. (E.g. ensuring standard (quality) equipment, adequate training, RD&D) Rural energy enterprises would be created/identified at the village or block level to design and implement the rural energy dissemination program.
- Each state would establish model projects.

Regional News - Asia



A new type of biogas plant under construction. It was developed by Raymond Myles, India. (see article issue No. 10) The bricks are replaced with a weaving of bamboo that is the reinforcement in a wood cement, low-cost construction.

Photo: Folkecenter for Renewable Energy, Denmark

	Up to March 94	Up to March 95	Target Up to 97	Potential
Family biogas plants	1.98 million	2.2 million	3 million	12 million
Improved Cookstoves	17 million	19.7 million	25 million	120 million
Solar Collector	277,329 m ²	296,349 m ²	1.1 million m ² *	10-20 million m ²
Solar Cookers	339,359	372,293	-	-
PV water pumps	756	1,354	50,000 *	-
PV power units	524.6 kWp	820 kWp	-	-
PV community unit	884	954	-	-
PV domestic light	32,241	67,171	1 million *	-
PV street light	28,674	32,871	-	-
Wind pumps	3,017	3,091	-	20,000 MW
Wind farms (grid)	116 MW	366 MW	500 MW	10,000 MW
Mini-micro hydro	110 MW	121 MW	600 MW	17,000 MW
Biomass	14 MW	20 MW	300 MW	

* No target for solar, only plan, (no electricity in 70 million households), Total solar insolation: 5×10^{15} kWh/yr

The article is excerpted from the TERI Publication: *Renewable Energy Development in India: Analysis of US Policy Experience, 1995.*

See this and other recent publication on the energy policy in India at the Publication List on page no.18.

More info:

Venkata Ramana, TERI, Tata Energy Research Institute, Darbari Seth Block, Habitat Place, Lodi Road, New Delhi, 110003, India.

Ph/fax: +91-11-4601920/-4621770, email: pvrmana@teri.ernet.in.

More info on the new law:

Ministry of Non-conventional Energy Resources, Block 14, CGO complex, Lodi Road, New Delhi, 110 003, India. Ph/fax: + 91-11-4361839/-4361298.

New Sustainable Energy Network in India

A new network, Integrated Sustainable Energy and Ecological Development Association - INSEDA, has been formed in India. The network will particularly deal with low-cost, small-scale renewable energy technologies for rural areas. It organizes a number of NGOs involved in biogas and bio-energy programmes.

The secretary of the network is Raymond Myles, who was elected as INforSE coordinator for Central Asia at the INforSE regional meeting in New Delhi, in May 1994. He was elected for three years. The new network will serve as host of the INforSE Central Asia Coordinator.



Raymond Myles, INforSE Coordinator of Central Asia is the secretary of the new network INSEDA. Previously he was the executive director of AFPRO. See article in the issue No.10.

Further information: INSEDA, New Delhi, India (see page 20)

Regional News - Asia

E-mail News Flashes on Transport of Asia-Pacific

SUSTRAN, the Sustainable Transport Action Network for Asia & the Pacific, is a network of organisations and individuals dedicated to promoting sustainable transportation policies. Anyone with an interest in encouraging more sustainable and equitable transportation systems is welcome to participate.

Regular short news flashes are released by e-mail. Some of the articles from November 1995: "China to have 45 million motorbikes by 2000", "Manila Vehicle Restraint Goes

Wrong", and "News on Bangkok's Mass Transit System".

The 1996 January issue includes the "Singapore White Paper" a summary of a 64-page paper entitled "A World Class Transport System," which is now out for public discussion. It outlines some changes to Singapore's traffic approach but the strong emphasis on public transport remains. It has a special appeal because this year is an election year in Singapore. The proposal increases

commitments to expand rail networks, and would provide for more express and premium buses. The plan aims to have 75% of all motorised trips made via public transport, compared to 51% now. The new proposals also include a 5 year road expansion program and are to reduce the extra high tax of buying cars.

More Info: Paul Barter, SUSTRAN, c/o AP2000, PO Box 12544, 50782 Kuala Lumpur, Malaysia. Ph/fax: +60-3-25591221-2532361, e-mail: tkpb@barter.po.my.

Renewable Energy in Vietnam

Over the past 15 years, most renewable energy technologies developed in Vietnam are at a very low-cost and intended, primarily, for family use. Due to the low income of the population (averaging US\$ 230/yr), high-cost technologies have not penetrated the market. Only for poorer areas, such as remote rural and mountainous areas, have been introduced subsidy granted for 5 years.

The best climatic conditions in Vietnam for the utilization of solar energy are to be found mainly in the south of Vietnam, followed by the central region of the country. However, at present, applications are not widespread, and one future aim is to create an awareness of the potential.

The most successful equipments developed by NRSE (National Program for New and Renewable Sources) are:

- energy saving cooking stoves,
- biogas digestors (1-250 m³),



- PV for family & small community,
- micro hydro power plant (200W-1,000kW),
- family size wind turbines and wind pumps,
- solar water heaters (with collectors 1-30 m²),
- portable solar cookers (with collectors 0.33 m²).

Besides the equipments developed, five studies have been carried out:

- Energy Conservation and Efficiency Master Plan;
- Social and economic constraints on the wide-scale application of

Solar Heater with integrated storage designed by RERC, Renewable Energy Research Center in Vietnam.

Since 1994, more than 40 systems of 1 m² have been installed. RERC aims to set up a production line for this new model.

RERC is member of VSED set up in May 1995 (See article SEN No. 10).

- NRSE technology;
 - Evaluation of applications for biogas and improved cooking stoves;
 - Use of computers for rural energy planning; and
 - Wind- and solar-potential evaluation.
- Source: articles by Nguyen Duc Loc, VSED (Tiempo, Dec.1995), and by Tran Quoc Qian, RERC, Hanoi National Institute of Technology, (RERIC News, June-Sept. 1995)*

More Info: VSED, c/o Ministry of Science Technology & Environment, 39 Tran Hung Dao, Hanoi, Ph/fax: +84-4-2618431-252733.

Pyramid Power, Australia

The Pyramid Power, a renewable energy package, is part of a concept for the future to supply energy in areas remote from conventional grid electricity in Australia. It was developed by Southeastern Renewable Energy, a unit of Illawara Electricity Utility.

It supplies 240V AC electricity. It has an array of photovoltaic modules connected to an automatic tracking unit

which maximises solar absorption.

It contains a battery bank, a DC inverter with microprocessor controls and a back up generator, which can operate on diesel, petrol or coconut oil. *More info: Robert Grimmer, SRE, Locked Bag 8849, South Coast Mail Center 2521, Wollongong NSW, Australia. Ph/fax: 42-28-29991-2890, email: grimmer@sre.com.au.*



Pyramid Power arrives on the back of a truck and can be installed in a couple of minutes. See also front page.

Regional News - Europe

The City as an Organism NGO Conference, July 1 - 7, '96

By Niels Lyck, OVE, Denmark

Copenhagen'96 is inviting 200 NGOs from Eastern and Western Europe to an Urban Ecology Conference that will be held in Copenhagen during the first week of July 1996.

The conference's goal is to create a forum for exchange of experiences, ideas, and views by NGOs from eastern, central, and western Europe that are working locally with urban ecology issues.

The conference is being organised by a working group based in OVE, the Danish Organization for Renewable Energy in Copenhagen. The initial economic support came from Copenhagen 96, a non-profit body supporting and co-ordinating the different cultural events that will take place in Copenhagen, the EU's Cultural Capital of the Year in 1996. We were happy that the organisers of Copenhagen 96 made this decision, which shows serious support for the green-city elements of the program.

The City as an Organism is also supported by two ministries (housing and energy/environment), EU Altener, and the KAB Foundation.



Conference programme

The four regular working days of the conference will be divided into three parts:

The mornings will be used for plenary sessions, with presentations and debate on different urban ecology issues by speakers from Eastern and Western Europe: Ekhart Hahn, Berlin, John Whitelegg from the UK, Adam Gula from Poland, Vida Ogorelec Wagner from Slovenia, Any Dobrinowa from Bulgaria, Jeppe Læssøe from Denmark, and others.

During the afternoons, the conferencees will participate in workshops, concentrating on issues like architecture, transportation, pollution, renewable energy, and local democracy. Each participant will work in one particular workshop for the whole week and, towards the end of the week will contribute to one of the visible results of the conference, an exhibition comprising a model and a poster from each workshop.

In the evenings, debates and presentations will be introduced by the conference participants themselves, and speakers will introduce issues of general interest, for instance: *pro et contra* the city as a sustainable entity.

Wednesday's program is an urban bicycle sightseeing to urban ecology projects in central Copenhagen.

On Sunday, the participants can visit eco-projects in the greater Copenhagen area - from an eco-village to

inner city districts. A common denominator of the projects is their connection to the Danish Local Agenda-21 development.

The venue for the conference is right in the heart of Copenhagen, close to the Central Station. The old Oxen-hall a former cattle market with its 5,000 square meters, is being transformed into an attractive exhibition area, which will accommodate the plenary sessions. Rysensteen High School, across the street, will house the check-in/secretariat functions, the workshops, and simple accommodations.

Participation Fee & Travel is Supported !!

The participation fee of 260 DM/person includes vegetarian/organic meals, and accommodations.

Participants from Central and Eastern Europe can apply for reimbursement of participation fee, and all European participants can apply for a full or partial reimbursement of travel expenses.

The first newsletter on the European urban ecology conference including program & application form, can be obtained from: OVE, Blegdamsvej 4, DK-2200 Copenhagen N, Denmark, Ph: +45 35 37 35 65, fax: +45 35 37 36 76, E-mail: ove@pns.apc.org.

INforSE-Europe Annual Meeting, June 30, '96

Prior to "The City as an Organism" Conference, the 1996 annual meeting of INforSE - Europe will be held in Copenhagen. The meeting will be on June 30, from 1 - 5 p.m., but all participants are invited to an informal discussion on INforSE to be held from 10 a.m.-12 noon and to lunch from 12 noon - 1 p.m.

The agenda will be as specified by the bylaws. The core of the meeting will be discussions of future INforSE activities conducted in Europe and worldwide. While it is up to the INforSE members to propose activities,

these will without doubt include follow-up of the ongoing evaluation of renewable energy potentials, exhibitions in Central and Eastern Europe, and the database on renewable energy producers (described on p12). Other issues will include lobbying the EU on energy policy, participation in the World Solar Summit and its follow-up, cooperation with the WISE network and other NGO networks, and eventually the formation of a North-South group in INforSE - Europe, consisting of European organizations dealing with development problems.

It is the hope of the organizers that many will use the opportunity to combine the INforSE - Europe meeting with participation in "The City as an Organism" Conference. The INforSE - Europe meeting is free, but without travel reimbursement. Travel reimbursement is available for "The City as an Organism" Conference.

The venue will be at the Ecology House, Blegdamsvej 4B, 2200 Copenhagen N, Denmark.

Contact OVE/INforSE-Europe about your participation on the meeting and the conference.

Regional News - Europe

Chernobyl + 10 year Campaign, April 20-22, '96

Many events are planned for the 10-year anniversary of the Chernobyl Catastrophe. In Russia and Ukraine, more than 15 larger events are planned, with exhibitions, biking and walking demonstrations, roundtables, seminars, and programs for children. Many television stations will show videos made by environmental groups on the problems of nuclear energy. In March, the All-Russian Anti-Nuclear Conference will be held in Tatarstan (contact Albert Gerapov, e-mail hadi@open.ksu.ras.ru). April 20-22 are the dates of the international conference "Lessons of Chernobyl", which will focus on the nuclear energy problems and the sustainable energy alternatives. More than 200 participants are expected (see events list). Beginning on April 20, and run-

ning for the following 6 weeks, there will be a large mobile exhibition in Ukraine, starting in Kiev and visiting 10 Ukrainian cities.

Also, in Western Europe, several events are planned in Sweden, Holland, France, and Germany, as well as in other countries. Various publications are available for the campaign, including a "fingerbook" with an overview of all nuclear power plants in Central and Eastern Europe.

More info:

Paxus Calta, SNEEZE / Wise Brno, Jakubské nám. 7, 60200 Brno, Czech Republic. Ph/fax: +42-542210438/347, e-mail: paxus@ec.n.gn.apc.org.

Vladimir Sliviak, Anti-Nuclear Campaign, Social Ecological Union's Center of Coordination and Information, PO. Box 211, 121019 Moscow, Russia. Ph/fax: +7095-9217161, e-mail: ecodefense@glas.apc.org.

Sustainable Europe Tour

Under the headings of climate change, sustainable energy, and five other issues, a mobile exhibition with a crew of environmentalists and artists will travel through Germany, the UK, Holland, France, Poland, Denmark, Sweden, Finland, the Baltic Republics, and Ukraine. Along with exhibitions the crew will organize workshops, music, theatre, and other performances. The tour will start on May 29, and will be in Copenhagen on July 2-3, in the same period as the "City as an Organism" Conference. It will end in the Czech Republic on August 4.

More info:

SET, Merzhauserstr. 150/007, 79100 Freiburg, Germany.

Ph/fax: +49-761-4071001-407125, e-mail: et@oln.comlink.apc.org.

Guideline on Renewable Energy Potentials

Guidelines on how to assess renewable energy potentials are now available from OVE / INforSE - Europe. The guidelines show how to make simple estimates of potentials based on data that are usually available in all European countries. These guidelines have been tested in Poland and Slovakia. For these examples, the results are compared with those of other studies.

The guidelines were presented at a meeting on renewable energy in Katowice, Poland in January, and will be presented in Bratislava at the end of March.

The guidelines have been developed with the support of the EU's Phare Partnership Programme, the Forum for Energy & Development, the Gaia Trust, PlanEnergi and others.

To order a copy of the guidelines, please contact INforSE - Europe.



Small-hydro power plant, Slovakia.

Energy Discussion in Slovenia and Croatia

A discussion is rising on the continuation of the Krsko nuclear power plant in Slovenia, which is producing electricity for Slovenia and Croatia. The plant's steam-generators are worn out, and the plant needs funding on the order of 120 million US\$ to continue. Further, the plant is situated in an earthquake zone that experiences an earthquake above the plant's design limit every 1000 years.

In Slovenia, a "National Committee for the Referendum" has been formed. It will start gathering signatures for a referendum. If movements against Krsko succeed in gathering 40.000 signatures, there will be a ref-

erendum, probably in July.

Besides the committee, more than 10 Slovenian groups will work for the referendum.

A group with participants from Slovenian and Croatian NGOs, as well as from a number of INforSE-organizations, is preparing a plan for a nuclear-free and more sustainable Slovenia and Croatia. The first results of this are scheduled for April.

More info: Paxus Calta, SNEEZE / Wise Brno, Jakubské nám. 7, 60200 Brno, Czech Republic. Ph/fax: +42-542210438/347, e-mail: paxus@ec.n.gn.apc.org.

Database on Renewable Energy Suppliers

A database on renewable energy producers and suppliers is under preparation by INforSE - Europe, with special focus on products and services available in Central and Eastern Europe. INforSE-Europe invites organizations to join as country focal points for the database.

The database should include information (brochures etc.) from the companies and basic information on each company.

More info: Emil Bedi, Foundation for Alternative Energy / INforSE - Europe, Bratislava, Slovakia.

Regional News - Europe

European Union Update

Compiled by Gunnar B. Olesen

New EU Funding for Renewable Energy

In response to the critique of reducing renewable energy funding by 18 million ECU (see Sustainable Energy News 11), the EU Commission has made a new round of funding for some forms of renewable energy within the Joule programme. The deadline for this was March 15.

The Commission still claims that it initially had to reduce the funding for renewable energy because the applications for renewable energy projects were of lower quality than the applications for fossil fuels projects.

Source: EU Commission, DG12 and Energy Center Denmark.

Directive on Integrated Resource Planning

A new EU directive is proposed on integrated resource planning in the electricity and gas distribution sectors. While the proposal is supported by a number of NGOs, including Climate Network Europe, it has been criticized by Eurelectric, representing the power sector. To make the countries approve this proposal, it is important that NGOs nationally support it and go into discussions with their governments about it.

Source: Climate Network Europe et al.



The White Paper on Energy favors energy grids over local sources.

EU White Paper on Energy

The EU Commission released a White Paper on Energy in December. While the White Paper addresses environmental questions better than did the previous Green Paper, it is still, in a number of ways, an outdated analysis of the energy sector. Its high focus on security of supply is not adequate in the present situation with surplus energy. There is no longer a need to promote unsustainable forms of energy, as the White Paper does with nuclear and coal.

The White Paper also promotes increased investments in energy networks, without considering that local supply from renewable energy sources is a better choice in some situations. The White Paper proposes a consulting

committee on energy, a chapter on energy in the new EU Treaty, and a continuation of the existing energy programs: SAVE, ALTENER etc.

The White Paper is now open for discussion. It seems, however, that the countries will not support the proposal of an energy chapter in the EU-Treaty. That might be a good solution, because an energy chapter would probably just reflect the unsustainable development proposed in the White Paper.

INforSE-Europe plans to comment the White Paper, and may be make a resolution on it at the annual meeting (see on page 11).

Source: Energy...in Demand, Danish Energy Agency and others.

European Liberalization of Electricity Markets

The proposed EU directive on more liberal electricity markets came to a temporary standstill when energy ministers could not agree on compromise proposals at meetings in December and February. The outstanding question is whether distribution companies shall have the right to buy electricity wherever they want. The main opposition comes from France. After the large strikes in December, France is even more reluctant to give up the monopoly of electricity trade of the state-owned Electricite de France, which might not be able to stand competition, with its large debts due to over-investment in nuclear power plants.

If no results are achieved at the EU energy ministers' meeting in May, the issue will be brought up at the prime-ministers' meeting in June (the EU-Summit). This might not lead to any resolution, after which the EU Commission probably will sue most of the EU countries for not fulfilling the free market provisions in the electricity sectors. According to the rules of the EU Internal Market, the Commission has a right to do so.

While a liberal EU electricity market is progressing slowly, the Nordic countries are moving faster. Early in 1996, the Norwegian liberal market for electricity will be coupled with a new Swedish electricity market. Similarly, Finland opened a more liberal electricity market for large customers. In Denmark, plans are under way to join the Nordic liberal electricity market, but with provisions to give priority to domestic renewable energy and to co-generation of heat and power.

This will be done by following the proposed EU directive, according to which all consumers can be charged for the public service obligations of the electricity sector, including the eventual extra cost of environmentally benign electricity production.

It remains to be seen whether this provision for environmental obligations can successfully combine a liberal electricity market and a sustainable development with increased energy efficiency and use of renewable energy.

Source: Danish Energy Agency et al.

Regional News - North America

Compiled by Nancy Hirsh, *Environmental Action, INforSE-North America.*

Santa Monica, California - A Sustainable City

The city of Santa Monica has implemented innovative energy and water conservation, transportation, and tree-planting programs. The city will reduce its negative environmental and social impacts by purchasing and using more environmentally sound products and procedures.

Between 1990 and 1993, the city has maintained its energy consumption at 4.0 million BTU's/year and reduced its water usage from 14.3 million gallons/day (mgd) to 12 mgd. In addition, 30 percent of the city's buses, trucks and vans are compressed-natural-gas and solar-charged electric vehicles.

To cut energy use, the city started a program with a large electric utility to retrofit several of the city's public facilities - city hall, a police station, three public libraries, six parking structures, a municipal pool, and a public auditorium. The retrofits were financed with a 12-year loan. The city

expects to recover its investment in 5.13 years through energy savings.

More info: Deborah Raphael, City of Santa Monica, Env. Programs Division, 200 Santa Monica Pier, Suite F, Santa Monica, CA 90401. Ph: 310-458-2255.

Sustainable-Energy US Budget Cut

The U.S. Department of Energy's (DOE) energy-efficiency research, development, and commercialization programs have been cut by 29 percent from 1995 funding levels. These cuts will have devastating impacts on residential business, and industry's efforts to reduce their energy bills. The home weatherization program for low-income homeowners was hit hard losing 50 percent of its funding.

Budget cuts to government R&D programs are very short-sighted. These programs, many of which were initiated in the 1970's, now save consumers \$150 billion a year in energy bills. Yet, the DOE's energy-efficiency programs cost only about one-tenth of 1% of the annual U.S. energy bill. Renewable-energy programs were also hit hard by the con-

servative Congress. Funding for solar and other renewable-energy programs was cut by nearly 30%, from \$388 million to \$275 million. This includes significant cuts to the wind-energy research and development program as well as to research into photovoltaics and solar thermal systems.

US Voters Against Federal Budget Cut

A US survey shows that the public opinion is against the federal budget cut in the sustainable energy programs. The public strongly favors the funding. In addition, most voters say that they would be more likely to support a candidate for Congress who shares their energy priorities. However, according to another US survey the Republican Presidential Candidates are out of step with the general public opinion. All candidates, except President Clinton and Senator Lugar, support significant cuts to the sustainable energy budgets and the abolition of the DOE entirely. *Source: Sustainable Energy Resources Newsletter, February 1996. See it at the publication list on page No.18.*

Regional News - Latin America

Latin American Institute for Social Ecology

REDES, the INforSE coordinator in Uruguay and other Latin American NGOs, created the Latin American Institute for Social Ecology to increase formal and informal education on sustainable energy and on other environmental issues. The Institute has several specific courses. It offers Master's degree on social ecology, and Diplomas in environmental impact assessment and in environmental education.

Source: INforSE-Latin America/REDES, Uruguay

ECOTECA Cooperative for Renewable Energy

In late 1995, the youth group of REDES created a cooperative, ECOTECA, to work with production and installation of renewable energy systems in Uruguay. One of its func-

tions will be to draw on the experiences gained from the REDES demonstration village, which demonstrates designs for affordable housing that uses renewable energy.

Source: INforSE-Latin America/REDES, Uruguay

Last Call for Bio Bio River

The private power company Endesa is planning to build 6 dams on the Bio Bio river in Chile. While the first dam, Pangué, is under construction, the company is now pushing for a far more damaging dam at Ralco. This dam will be 155 m high with 34 km² of reservoir and 570 MW installed capacity. One major damaging effect of this construction would be to dry up 10 km of the river. In addition, it would displace directly 600 people, threaten unique wildlife, and degrade the water quality of the Bio Bio river, thus endangering the drinking water of the one million

people who currently take drinking water from the river.

The Pangué dam is being financed with 70 million US\$ from the International Finance Corporation, along with 150 million US\$ from European banks as well as Swedish and Norwegian development assistance programs. Endesa is now looking for international funding to construct the 500-million-US\$ Ralco dam project.

The Grupo de Accion por el Bio Bio of Chile (Action Group for the Bio Bio) and the International Rivers Network (IRN) are asking for support for the struggle against the Ralco project. They ask concerned organizations and citizens to send protests to the national and international agencies funding the Pangué dam. They also produce a bi-weekly "Bio Bio Update."

More info: IRN, 1847 Berkeley Way, Berkeley, CA 94703, USA.

Ph/fax: +510-848-11551-1008, e-mail: glenirn@igc.apc.org.

Regional News - Latin America

Solar Energy in Rural Chile



By Ruben Vasquez Cavieres,
TEKHNE, Chile

Chile is a country whose geographic and climatic conditions favor the use of non-conventional energy sources. Sunlight is abundant from the North to the Central Zones, the South has abundant hydro potential, and the wind is consistently strong in the coastal areas as well as in some parts of the interior. In many cities, the garbage is largely composed of organic materials.

However, exploitation of these resources is minimal, representing only 0.19 % of the energy sources used in the country. Of this small portion, nearly 1.33 % is solar.

One of the objectives of TEKNE (Center of Experimentation and Training in Appropriate Technology) is to contribute to the diffusion and best application of the non-conventional energy sources available in Chile.

TEKHNE, through its Technological Development program and with financial support from the Belgian organisation, Broderlijk Delen, has initiated this process by designing, constructing, and installing solar systems to heat water in communities in which socio-economic conditions exacerbate environmental problems.

The activities are centered in the rural sector of the "comuna" of Cabildo, located 250 km north of the capital, Santiago. The zone is semi-arid, with temperatures varying be-

tween an average high of 28 °C in January and an average low of 4 °C in July, with many clear days reaching satisfactory solar radiation values (5.2 kWh/m²d annual average). Social indicators show a community with 16.2 % of its population in extreme poverty.



Rural school in Bartolillo

On the site of this school, the work of diffusion of solar collectors for water heating was initiated in the zone in the winter of 1993. Two solar panels were installed, with a total collection area of 4.2 m². The system includes a 300-L accumulation tank, to meet the hot water demand of the bathrooms used by children at the school.

Rural school in La Vina

The system at this school attended by 250 children between the ages of 6 and 13 years was designed to serve not only the students and faculty but the general community as well. The site is used as a community gathering place, with various activities including football games and fiestas. The system is made of 7 solar panels with an absorption surface of 16.1 m² and an accumulation tank of 1050 L capacity. The system also satisfies the hot water needs of the school kitchen.

Steady desertification of the zone's Alicahue Valle and its inaccessible distance from urban centers, in which conventional combustibles such as gas or oil might be readily available, have left the community in need of socially and technologically appropriate energy sources.

Solar systems were installed at four rural schools and a health clinic, for the following reasons: many people are served by these places, which previously lacked hot water; and, the use of alternative energy at these sites has a major educational impact, especially since the source is the sunlight, which is so abundant there.

At each installation, the faculty members have completed courses to equip them to teach community members the basics of how the solar systems work, and to ensure good maintenance and management of the system. Community interest has grown since the first installations, expanding to local authorities, who have directed support for the later installation.

Generally the systems are placed on a wooden platform approx. 6m high and oriented to the North. Each solar panel is 2.3m² with a horizontal inclination of 47 degree and use Hidro3 Special polypropylene as fluid.

More info: TEKNE, Ureta Cox 1034, Casilla 210 Correo 13, San Miguel, Santiago, Chile.

Ph/fax: +56-2-5516056/5561887.

Renewable Energy Sources in Mongolia



By Bolormaa Batsukh from IRE Mongolia presently at the Folkecenter for Renewable Energy, Denmark

Mongolia is a land-locked country of approximately 1.6 million square kilometres sandwiched between Russia and China. The population is only 2.5 million, of which half live in the rural areas and mainly are nomadic livestock herders. Around 198,500 Mongolian families in rural areas rely on animal husbandry. The livestock population is more than 28 million, comprised mainly of horses, cattle, yaks, sheep, goats, and, in the Gobi, also camels. The most rural families are dependent on (fuel wood or) cattle dung and candles for their cooking, heating, and lighting energy.

The needs for electricity in the rural areas are obvious, and there are no methods of producing or supplying electricity to these areas other than by means of small diesel or gasoline generators (Honda). Due to lack of infrastructure (electricity lines) and the widespread population, renewable energy systems have extremely good potential for improving the lifestyle and welfare of the herders and their families in rural areas.

The IRE

Mongolia is rich in renewable resources. Over the last ten years, maps have been made of Mongolia marking the solar and wind-energy potential of

selected rural areas. The Institute for Renewable Energy (IRE), a member of the Global Renewable Energy and Ecology Centres for Action (GREECA), is the key institution for Research and Development of renewable energy sources in Mongolia.

The IRE was founded in 1985 and is headed by Chadraa Baataryn, vice-president of the Mongolian Academy of Sciences. The main IRE building is located in Ulaanbaatar, and the institute's testing sites of wind, biogas, solar facilities are in a suburb, Central Aimak, about 90 km far from the Capital city. Today, the IRE belongs to the Ministry of Energy and gets all of its funds from the Ministry of Science and Education.

Biogas

Mongolia has significant potential for biogas, in the form of 10 million tons of cattle dung per year. Four simple pilot digesters for cold climates with volumes of 1, 5, 40, 100 cubic meters, respectively, have been built and installed by IRE in Mongolia for demonstration purposes. Large-scale use of biogas has been considered as option at cattle farms, but the breakdown of the state co-operatives presents institutional problems in introducing the technology. As the private livestock herders' companies become larger and more organized, the single farm biogas plants may be considered by such groups, if they are convinced of the

*PV systems are brightening the tents of the nomadic herdsmen with electric light and radio.
Photo: IT Power*

usefulness of such technology. However, there is a much greater gain to be made by installing simple rural household plants to be operated on cattle manure.

Solar Water Heaters

Mongolia has about 300 sunny days per year, from which the solar radiation received is about $1,000 \text{ W/m}^2$. The Institute of Renewable Energy is the centre of expertise on solar energy in Mongolia and has developed, fabricated, and disseminated 5 types of solar water heaters.

Activity peaked in 1991, when more than 2000 m^2 of solar collectors were manufactured and installed in tourist centres, children's pioneer camps, and sports centres that are occupied only in the summer. The production in 1993 had fallen considerably as a result of the difficult economic climate.

Solar PV

The Ministry of Energy, Mining and Geology distributed 3000 small photovoltaic lighting systems imported from China. Each unit comprised an 11Wp amorphous silicon module manufactured by Harbin Chronar of China and a Chinese manufactured lantern unit. These lighting units were modified by the IRE to incorporate rechargeable batteries and output for powering radios.

More recently, the IRE, in collaboration with the Japanese government is evaluating some 200-PV systems for livestock-herding families. Each system includes a 204-Wp PV array, a 200-Ah battery, and an inverter, which allows the use of standard domestic appliances such as 18-W fluorescent lamps, 75-W colour TV sets, knife sharpeners, etc.

Wind

Mongolia has significant wind energy resources. In almost every part of the steppe region, the average annual wind speed is no less than 5 m/sec., while mean wind speeds of 5-6.5 m/sec are available in the Gobi region. Wind energy is a practical and economical solution for the nomadic families and at bag-centres. A bag is the lowest level in the Mongolian administrative system and is the service unit closest to the nomadic livestock herders.

The most significant recent development of wind energy in Mongolia is the introduction of the 50-Watt MONMAR battery charger. This product was the result of a successful technology transfer which took place from 1989 to 1992 via the British company MARLEC Engineering Co. Ltd., and the Mongolian enterprise, MONMAR Engineering Co. Ltd.

More than 2000 units have been installed for use by herdsmen all over the country during the last 4 years. The 2000 MONMAR windmills represent an installed capacity of 100 kW, but there are no large-scale commercial wind turbines installed in the country.

Future Projects:

Given the large potential for renewable energy, the main purposes of future activities on sustainable energy in Mongolia will be:

- Fund-raising for projects such as those listed below.
- Implementation of one Danish-type farm biogas plant (with the Folkecenter for Renewable Energy).
- Implementation of 5-8 super-insulated small-scale household biogas plants (INSEDA, India, see p. 9)
- Assessment of other prospects for the use of biogas plants.
- The Project for Technology Transfer of Small Stand-Alone Wind Systems (1-5 kW).

More Info: Dr. Chadraa Baataryn at the Institute for Renewable Energy (IRE), P.O.Box 52/40, 210152 Ulaanbaatar, Mongolia, ph/fax: 976-1-3423771-342377; or, at the Mongolian Academy of Sciences, Sukhbaatar Square 3, Ulaanbaatar, Mongolia. Ph/fax: +976-1-327827, fax: +976-1-321638.

Windmill Record

More new windpower-production capacity was installed in 1995 than in any previous year. The additional worldwide installed capacity of the larger types of electricity-producing wind-turbines was 1289 MW, or 78% more than in 1994, which also was a record year. The total installed capacity of larger turbines is now 4900 MW.

The largest part of this new capacity, was installed in Europe, where the "old" windturbine nations, Germany, Denmark, and Holland, increased their installation rate, while Spain, the United Kingdom, Sweden, and Italy also have installed more than 10 MW each. France has tripled its installed wind capacity from 3 to 9 MW.

In Asia and the Pacific, 95% of new installations were done in India, while most of the rest, 14 MW, was installed in China. Like many other countries, China plans to boost its use of windturbines and to increase installed capacity from the present 44 MW to 1000 MW by the year 2000. In the next decade, it will continue to expand capacity to use more of its vast windpower potential, estimated at 250,000 MW.

In the Americas, most windturbines were installed in USA, but as the 53 MW of windturbines installed in the US did not fully replace the 60 MW of decommissioned windturbines, the installed capacity actually fell by 0.5% in the USA, to 1654 MW.

	Installed capacity '95	Standing capacity Dec. '95
Germany	500 MW	1132 MW
India	375 MW	576 MW
Denmark	98 MW	637 MW
Holland	95 MW	249 MW
Spain	58 MW	133 MW
USA	53 MW	1654 MW
UK	40 MW	201 MW
Sweden	29 MW	69 MW
China	14 MW	44 MW
Italy	11 MW	33 MW
Others	17 MW	169 MW
Total	1289 MW	4897 MW

The windturbines are producing about 10 TWh, equivalent to the electricity consumption of about 1.5 million Danish Citizens or about 30 million Citizens of India (including commercial and industrial use).

In addition to these larger turbines, there are more than 10 MW of small windturbines that operate apart from the grid and meet local electricity needs, along with hundreds of thousands of water pumping windturbines.

Sources: Xinhua News Agency and BTM Consult, J. C. Christensens Alle 1, 6950 Ringkøbing, Denmark

Fax: +45-97 32 55 93.

Repay Energy

A recent study shows that a new grid-connected windturbine will replace the energy it takes to produce it in 3 - 4 months under normal Danish conditions. The study also reports that by the end of the lifetime of the windturbine, there is a net energy gain from scrapping it and recycle the materials. The following table shows the energy balance for a 600-kW turbine. Figures are in Tera-Joules of primary energy, and a conversion factor of 43.5% is used for other sources of electricity to calculate amounts of electricity represented by amounts of primary energy.

Manufacturing	1.9 TJ
Installation*	0.5 TJ
Operating & Maintenance	0.8 TJ
Decommissioning	0.5 TJ
Saved energy by recycling	-0.7 TJ
Total	3.0 TJ
Annual production**	11.5 - 9.3 TJ
Pay-back	3.1 - 3.8 months

* Installation includes cable & grid connection, foundation, transformer & other necessary parts.

** Annual production of 1.4 million kWh and 1.1 million kWh for windturbine sites in Denmark on the coast (roughness class 1) and inland (roughness class 2).

Source: Danske vindmøllers Energi-balance (The Energy Balance of Danish Windturbines), Dec. '95 (available in English) Danish Windturbine Manufacturers' Association, Nørre Voldgade 48 opgang B, 1358 Copenhagen K, Denmark, Fax: +45-33779990.

Publications

Renewable Energy Development in India: Analysis of US Policy Experience. (See article page No. 8-9)

Edited by P. Venkata Ramana, Keith Kozloff, 14 authors participating on a seminar January 1995 by TERI and WRI, USA. 1995, 153p, US\$ 33 inclusive postage.

Planning for the Indian Power Sector Environmental and Development Considerations.

By Canadian Energy Research Institute and Tata Energy Research Institute, Study No 62, June 1995. 365p, US\$ 80 inclusive postage.

Environmental Considerations and Options in Managing India's Long-Term Energy Strategy.

Prepared by a 42-person TERI project team, supported by Indian Ministerial Steering Committee and by UNEP.

Energy Environment Monitor of India, Special Issue on Wind Energy

438p March 1995, US\$ 25.

Pacific and Asian Journal of Energy, Special Issue on Renewable Energy

Volume 5 no.1, 8 articles: woodfuel Philippines, environ-renewables in India, solar in Middle East, biogas, cookstove in China, GIS to sense biomass in Pakistan, 141p, June 1995

Contact: Tata Energy Research Institute (TERI) Darbari Seth Block, Habitat Place, Lodi Road, New Delhi 110 003, India. Ph/fax: +11-91-11-4601920/-4621770.

e-mail: mailbox@teri.ernet.in

The Role of the Private Sector in the Small-Scale Hydropower Fields.

By K. Goldsmith, MHPG Series, Volume 12 165p 1995, SFr 30.

Solar Water Heaters in Nepal, Manufacture & Cost Calculation

Edited by Mechanical Training Centre (MTC) Kathmandu, Nepal. 240p, 1990, SFr 25.

Contact: Ilona Paizs, Swiss Center for Development Cooperation in Technology and Management (SKAT) Bookshop, Vadianstr. 42, 9000 St Gallen, Switzerland.

Ph/fax: +41-71-237475/-237545
e-mail: 100270.2647@compuserve.

Farmers, Forests and Fuel

Towards a new biomass energy strategy in Sri Lanka

By Mick Howes with Pandula Endagama, 1995, 170p

Contact: Intermediate Technology Publication, 103/105 Southampton Row, London WC1B 4HH, UK. Ph/fax: +44-71-436-9761/-2013.



The Green Plan: Energy, Jobs, Opportunity & a Cleaner Environment

A blueprint of an energy future that utilizes energy efficiency and local renewable resources. The report outlines how the state can strengthen local economies, diversify Wisconsin's energy supply, and reduce greenhouse gas emissions.

Contact: Wisconsin's Environmental Decade, 14 W. Mifflin St., Suite 5, Madison, Wisconsin, 53703, USA.

Ph: +1-608-251-7020.

Air Pollution & Climate Series, '95: No. 3 Sulphur emission from large point sources in Europe

By Mark Barrett, R. Protheroe, 20p

No. 4 To clear the air over Europe

A critical examination of the present guidelines and standards for air quality, with proposals for the revision, 40p

By Magnus Nilsson

No. 5 Large Combustion Plants, Revision of the 1988 EC Directive

By Frederick Lundberg and Christer Agren, 24p.

Contact: The Swedish NGO Secretariate on Acid Rain, Box 7005 402 31, Göteborg, Sweden.

Ph/fax: +46-31-15-3955/-0933

Periodicals

Natural Energy Review

The Only Indian Monthly on Renewable Energy

Published by Strategic Communications. Inaugural Issue, January 1996.

Contact: Amit Chakravarty, Strategic Communications, 1st Floor, Walker House, Off Tribhuvan Road Corner, Lemington Road, Bombay 400004, India.

Ph/fax: 382-5308, e-mail: high.spirits@access.net.in.

International Solar News

Newsletter for the International Centre for Application of Solar Energy (CASE)

1st issue: October 1995

Contact: CASE Level 3, 81 St George's Terrace Perth, WA 6000, Australia. Ph/fax: +619-321-7600/-7497, e-mail: case@wantree.com.au.

Newsletter of Postgraduate Course of Renewable Energy

Published by University of Oldenburg two times a year. The MSc course prepares for applying RE technology in the Third World.

Contact: Edu Knagge, PO Box 2503, 26111 Oldenburg, Germany.

Ph/fax: +49-441-798-3544/-3326, e-mail: edu@pre.uni-oldenburg.de

Third Opinion

Australia's independent quarterly safe energy journal,

Contact: Claire Gerson, Suite 15, 1st floor 104 Bathurst Street, Sydney. Ph/fax: 2-283-2003/-2005, e-mail: foesydney@peg.apc.org.

SEA News

Published by CANSEA, Climate Action Network - South East Asia

Contact: Gurmit Singh, CANSEA, PO Box 382, 46740064 Petaling Jaya, Malaysia. Ph/fax: 603-7757767/-7754039, email: epsm@peg.apc.org.

(Please note that CANSEA moved in January 1996 to the Center for Environment, Technology and Development in Malaysia)

Sustainable Energy Resources

Published by SUN DAY Campaign Reviews the US Governmental Sustainable Energy Policy.

Title changed from Sun Day Update. Issue August, 95 included a list of

'Low and no-cost educational resources on renewable energy and efficiency technologies.'

(Films, videotapes, curricula materials from US)

Contact: 315 Circle Avenue, #2, Takoma Park, MD 20912 4836, USA.

Ph/fax: +1-301-2702258/-8912866.

Centre for Our Common Future Closed

The Geneva-base Centre for Our Common Future is now closed. It issued "The Networker" and was instrumental in much of the coordinating and exchange of information for the Rio Summit in 1992, which increased the value of the NGO activities there.

Source: Development Alternatives, New Delhi, India.

Events

*Event with INforSE participation

April 8-12 & April 19-21, 1996

PV Design & Installation & Microhydro Electric Power Workshops, Asheville, NC, USA

Educational program & Conf. of American ISES. Other workshops in Carbondale Colorado in May & September.

Info: Solar Energy International, PO Box 715, Carbondale, CO 81623. Ph/fax: 1-970-963-8855/-8866, email: sei@solarenergy.org.

*April 20-22, 1996**

Lessons of Chernobyl Conference, Kiev, Ukraine

Info: INforSE Europe, See p 12

April 24-26, 1996

EnerCon'96, Kiev, Ukraine

2nd Energy Conf. & Exhibition coop. with the Ukrainian Ministry of Power Industry.

Info: Lidia Noll, NeoCom/EnerCon, vul. Jaroslavlav Val 26, 3rd fl. room 2 Kiev 252034, Ukraine. Ph: +38-044-212-2392, ph/fax: -224-5093 or in USA ph/fax: 1-305-6709444/-6709459.

April 25-26, 1996

Int. Nuon Conf. on Utilities and Solar Energy, Apeldoorn, The Netherlands

Info: Mariette Dullemond, PO Box 2732, 3500 GS Utrecht, The Netherlands. Ph/fax: +31-302-300789/-310318.

May 20-21, 1996

Energy & Environment Conference, Copenhagen, Denmark

Info: Society of Danish Engineers, Vester Farimagsgade 29, DK-1780 Copenhagen V. Denmark. Ph/fax: +45-33156565/-33158854.

May 20-24, 1996

Mediterranean Solar Summit, Valletta, Malta

Info: See page no. 4.

May 29 - June 1, 1996

Solar'96, Int. Symposium for thermo & PV solar technology

Info: Erneuerbare Energie, Postfach 142, 8200 Gleisdorf, Austria. Ph: 3112-588617

May 29 - June 2, 1996

NGO Workshop North-South, Artefact, Glucksburg, Germany Sustainable Project Development with Appropriate Technology

Info: Artefact, Bremsbergallee 35, 24960 Glucksburg, Germany. Ph: +49-4631-6116-0, fax: +49-4631-6116-28.

June 3-7, 1996

Energex '96, Beijing, China

The 6th Int. Energy Conf. & Expo.

Info: IMeng Xiangan, China Solar Energy Society, 3 Huayuan Road, Beijing 100083, China. Ph/fax: +86-1-201-7009/-2880.

June 3-7, 1996

Cubasolar'96, Santiago de Cuba & Guantanamo, Cuba

Info: Cubasolar, Calle Luz # 375 entre Picota y Compostela. Habana Vieja. Ciudad de la Habana, Cuba. Ph 537-612846

June 3-14, 1996

Habitat II: UN Conference on Human Settlements, Istanbul, Turkey

Info: UN Centre for Human Settlements, Room DC2-0943, United Nations, New York, NY 10017, USA. Fax: +1-212-963-8721.

June 15-21, 1996

World Renewable Energy Congress IV, Denver, Colorado, USA

Info: A.A.M. Sayigh, WREN, 147 Hilmanton, Lower Earley, Reading RG64HN, UK. Ph/fax: +44-1734-61136-4/-5.

June 19-21, 1996

Asia-Pacific Conf. on Sustainable Energy & Env. Technology, Singapore

Info: APCSEET Secretariat, Nanyang Technological University, Nanyang Avenue, 2263 Singapore. Ph/fax: +65-79-95243/-16178, Email: apcse96@ntuvax.ntu.ac.sg.

June 20-24, 1996

ÖKO'96 Messe, Freiburg, Germany

Info: BUND, Landesverband Baden-Württemberg e.V. Dunanstrasse 16, D-79110, Freiburg. Ph/fax: +49-761-88595-0/-90

June 24-27, 1996

9th European Bioenergy Conference, Copenhagen, Denmark

Info: DIS Congress Service Copenhagen A/S, Herlev Ringvej 2C, 2730 Herlev, Denmark. Fax: +45-4492-5050.

June 26-28, 1996

Power-Gen Europe '96, Budapest, Hungary

Info: Ms Nel Jonk, Kaap Hoozdreef 54, 3563 AV Utrecht, The Netherlands. Ph/fax: +31-30-6509-63/-28.

*June 30, 1996**

INforSE - Europe Annual Meeting, Copenhagen, Denmark

Info: INforSE - Europe, See page no. 20

*July 1-8, 1996**

The City as an Organism, Urban Ecology Now & in the Future, Copenhagen, Denmark

East-West European Conference & Exhibitions on sustainable energy &

urban environmental solutions. Part of Cultural City Copenhagen '96.

Info: Niels Lyck, OVE, Blegdamsvej 4, 2200 Copenhagen N, Denmark. Ph/fax: +45-3537-3565/-3676. Email: ove@nn.apc.org. See p. 11

July 8-12, 1996

Moscow Solar Summit, Moscow, Russia

Info: see page no. 4 & 5.

August 4-24, 1996

Ecotopia, Czech Republic

Environmental camp with workshops on sustainable energy and much others.

Info: EYFA, Postbus 94115, 1090 GC Amsterdam, Netherland, Ph/fax: +31-20-6657743/-6928757, e-mail: eyfa@antenna.nl.

August 25-31, 1996

Energy Efficiency in Buildings, Pacific Grove, CA, USA

Summer Study Seminar

Info: ACEEE, 2140 Shattuck Avenue, Suite 202, Berkeley, CA 94704 USA. Ph/fax: +1-510-54999-14/-84.

September 9,10,11, 1996

Int. Conference: Environ., Long - Term Governability & Democracy, Abbaye de Fontevraud, France.

Info: Monique Cavagnara, Centre de Prospective et de Veille Scientifique, Drast, Matet, Tour Pascal B, F92055 Paris La Defense, Cedex 04 France. Fax: +33-1-40816396.

September 15-19, 1996

Bioenergy '96 Nashville, Tennessee, USA

7th National Bioenergy Conf., & 3rd Liquid Fuel Conf.

Info: Bonnie Badger, Southeastern Regional Biomass Energy Program, Tennessee Valley Authority, CEB 3A, PO Box 1010, Muscle Shoals, Alabama 35662-1010. Ph/fax: +1-205-386-2925/-2963.

September 16-19, 1996

EuroSun '96, 10th Int. Solar Forum, Freiburg Germany

Info: ISES-Europe or Deutsche Gesellschaft für Sonnenenergie, Augustenstrasse 79, 80333 München, Germany, Ph/fax: +49-8952-4071/-1668

*September 16-17, 1996**

World Solar Summit, Harare, Zimbabwe

Info: See page no. 4.

October 15-18, 1996

ENEF'96, Slovakia

2nd Int. Conf. & Exhibit. of Association of Energy Managers of Slovakia.

Info: Marian Rutsek, Kukucinova 5, Banska Bystrica, PSC 97401, Slovak Republic. Ph/fax: +42-88-7233-923/-20.

Your last copy of Sustainable Energy News?

We are evaluating Sustainable Energy News, and have sent questionnaires to all receivers of the newsletter. If you receive Sustainable Energy for free, and you are not representing a member of INforSE (or in Denmark Forum for Energy & Development), you will only receive the next issue if you have

returned the questionnaire (or otherwise informed us since November, 1995).

Paying subscribers and INforSE members will continue to receive Sustainable Energy News regardless of their answer, but we hope that most will answer anyway.

In the next issue of Sustainable Energy News, we will summarize the results of the evaluation. We will also use the results to improve the newsletter whenever possible.

For the 200+ that already answered to the evaluation, we will like to thank you for your contribution.

Join the INforSE Network

INforSE is a worldwide network of NGOs unified by a common goal - long-term sustainable energy development and a phase out of nuclear and fossil energy consumption.

INforSE is open to membership for independent organizations. Membership is free of charge, though voluntary contributions are welcome. INforSE has core members and associate members. Core members of INforSE are independent organizations which support in their words and actions the energy strategy behind INforSE, "Sustainable Energy Development - Towards a World Strategy", and that are approved by their respective INforSE region. Core members have voting rights at regional meetings. 154 organ-

izations are members of INforSE worldwide. If your organization wishes to become member of INforSE, please send a request to your regional INforSE coordinator or to the INforSE Secretariat.

In each of the seven INforSE regions, member organizations and the regional coordinator(s) organize regional initiatives. As examples, the European region is co-organizer of the large urban ecology conference "The City as an Organism" (July 1-7), the East African region is preparing a series of workshops on job creation in renewable energy, and the Latin American region is preparing a regional sustainable energy conference jointly with the ELAN Network.

Volunteer in Ukraine?

As part of the C + 10 campaign (see p. 12) will be a large sustainable energy exhibition tour, April 20 - May 31. If you are interested to join as volunteer (with expenses covered during the period), please contact INforSE-Europe at OVE, or Ann Vikkelsø, Folkecenter for Renewable Energy (see page 2), email: fcenergy@inet.uni-c.dk.



Trailer for exhibition at use in Denmark

INforSE Coordinators

Africa, Eastern

FWD- Found. for Woodstove Dissemination, P.O.Box 30979, Nairobi, Kenya, Ph.: +254-2-566 032, fax:+254-2-740524/561464, email: stephen_karekezi@elci.gn.apc.org att. Stephen Karekezi, Timothy Ranja

Africa, Western

ENDA-Energie, 54 rue Carnot, B.P. 3370, Dakar, Senegal. Ph.: +221-225983/222496, Fax: +221-222695/-235157, E-mail: energy@endakar.gn.apc.org att. Youba Sokona, Masse Lo

Eastern Asia & Pacific

PCATT- Philippine Center for Appropriate Technology & Training, 224 Diego Silang Str. 4200 Batangas City, Philippines. Ph.: +63-43-723-1155, Fax: +63-43-723-0340 E-mail: inforse@phil.gn.apc.org att. Benjamin Gertes

Asia, Central

INSEDA - Integrated Sustainable Energy and Ecological Development Association 3rd floor, St Soldier Tower, Vikas Puri, New Delhi 110018, India. Ph.: +91-11-5522006 Fax: +91-11-6478420, att. Raymond Myles

Europe

OVE - Danish Organization for Renewable Energy, Skovvangsvej 191, 8200 Århus N, Denmark. Ph: +45-86106466, fax:+45-86106188 Email: ove@nn.apc.org att. Gunnar Boye Olesen

SZOPK-Foundation for Alternative Energy, Gorkeho 6, 81101 Bratislava, Slovakia. Ph/fax.: +42-7-364665/-313968, Email: bedi@scps.ke.sanet.sk att. Emil Bedi

Latin America

IED - Instituto de Ecologia e Desenvolvimento, rua da Assembleia 10, sala 816, Rio de Janeiro, CEP 20119-900, Brasil. Ph/fax:

+55-21-531-2948, (Univ.: Ph/fax: +55-21-2709995/-2906626 Email: emilio@ppe.uftr.br att. Emilio & Ana Lucia La Rovere

REDES, Av. Millan 4113, 12 9000 Montevideo, Uruguay. Ph.: +598-2-356265, Fax: +598-2-381640, Email: redesur@chasque.apc.org att. Martin Prieto Beaulieu

North America

Environmental Action, Energy Conservation Coalition, 6930 Carroll Ave. #600, Takoma Park, MA, 20912 USA. Ph.: +1-301-891-1100, Fax+1-301-891 2218 Email: eaf@jgc.apc.org att.: Margaret Hubbard