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Front page: Solar PV Shop in Chuka, Kenya with the owner, Sial Kinyua See article "Seeing the Light: Solar PV in East Africa"

on page 6. Photo: Ann Heidenreich, 1996

The Sustainable Energy News and Contact List is on INTERNET :
WWW: http://solstice.crest.org/renewables/sen/index.html.
NEW: INforSE on INTERNET: WWW: http//www.INforSE.dk/

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Editorial:
Sustainable Energy is rapidly being introduced in all parts of the world. The March issue of Sustainable Energy News reported on large growths in the installed capacity of wind turbines again in 1995. In this issue, we mention the 8-doubling of the Solar PV production in the period 1980-95. Similar growth rates are found in the use of other sustainable energy technologies: rapid increase in improved cookstoves in Eastern Africa, of biogas in Central Asia, of solar water heaters in Greece and Turkey, of solar cookers in India and Africa, of energy efficiency in Eastern Europe, just to mention a few.

With all these successes, do we still need to strengthen NGO-activities for sustainable energy? Do we need to mobilise the forces of the NGOs to further speed up the changes?

One answer is that, in spite of the successes with sustainable energy, the energy-related environmental damage is steadily worsening with the ever-increasing emissions. The trend is for further increases in the global emissions, as, e.g., the largest emitter of CO2, USA, will probably not be able to stabilize its emissions, as reported in this issue. Even the environmental movements have changed their focus from stopping global warming to reducing it. As reported in this issue, Climate Action Network will lobby for reductions in greenhouse- gas emissions to stabilize their atmospheric concentrations below the equivalent of 2 times pre-industrial levels of CO2, which would lead to about 2C raise of the global temperature (estimated temperature raise: 1.1 - 3.3 C according to UN Panel of Climate Scientists). A 2 C increase in global average temperature will have some harmful effects to the environment, and thereby to human societies; it is rather a survival strategy than the optimal, environmentally benign solution.

Changing from increasing to declining emissions worldwide is technically possible, starting with changes in industrialized countries, which presently have by far the largest share of emissions. In many cases, the changes also have benefits for the society.

Unfortunately the technology & market driven introduction of sustainable energy is not fast enough to ensure a sufficient drop in emissions, even though it is fast enough to make sustainable energy business very prosperous. One way to increase the speed of development is to combine the technology and market-driven strategy with bottom-up strategies to integrate the users from all segments of the society into the development and dissemination of sustainable energy solutions. Community-based organizations (CBOs) and other NGOs have large roles to play in implementing these bottom-up strategies. They are already active in many of the above-mentioned successes.Together with the increasing popular understanding of the environmental problems, they are key agents of the necessary changes.

Gunnar Boye Olesen

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INforSE
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INforSE Coordinators' Meeting

The INforSE regional coordinators will meet again, September 10-11 and 18, in Harare, Zimbabwe, before and after the World Solar Summit. On the agenda are INforSE activities for the coming year, including:

- follow up of the World Solar Summit,
- monitoring Multilateral Development Banks,
- support fundraising for INforSE members and regions,
- prepare for UNESCO Conference on Adult Education,
- regional activities,
- a discussion of this newsletter based on the evaluation.

The issue "support fundraising" will include discussion of the reports on international funding for NGO energy activities, published by INforSE (see also p. 19), and the INforSE project on training for NGOs in Eastern Africa, which is proposed as a strategic project for the Solar Summit.
At the meeting will be discussed proposals from the regions, as well as from individual INforSE member organizations.

Proposals for the meeting should be sent to the relevant regional INforSE coordinator, or to the Secretariat. Proposals must be received not later than September 1, 1996.

New Editorial Address from July 30, 1996

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The new office is situated at an ecological village project, 10 km North of Aarhus, Denmark. The office also hosts INforSE - Europe and some international cooperation projects of OVE, The Danish Organization for Renewable Energy.

Evaluation of Sustainable Energy News

Since last November, all receivers of Sustainable Energy News have received an evaluation form for the newsletter. 450 have now answered, many of them with valuable comments. The answers show that the largest interest is in regional news, technical articles, success stories, the contact list, world/UN news, and events. Some readers proposed more pages and/or colours. This is

not possible with the current budget.
We thank for all the inspiring contributions to the evaluation. However, the evaluation is finalized, we are still happy to receive further ideas, comments, and proposals for articles.

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World News
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Climate Negotiations Coming Up

When the countries meet in Geneva in July for the second conference on the Climate Convention (COP2), they will discuss new scientific evidence on man-made climate change. The UN Scientific Panel on climate change (IPCC) foresees in their second report that:

- without mitigation of man-made greenhouse gas emissions, the CO2 concentration in the atmosphere by sometime between 2030 and 2050 will be double the pre-industrial level, and the Earth's mean temperature is projected to increase by between 0.8 and 3.5 degrees C by 2100, a rate faster than any observed during the last 10,000 years.

- sea level is projected to rise by between 15 and 95 cm by 2100.
- climate change is likely to have wide-ranging and mostly adverse effects on human health, with significant loss of life.

At the conference, the countries will make a declaration and discuss set targets for the protocol to which they agreed at the first climate convention conference in Berlin in March, 1995, and that will be finished at the third conference in Japan in 1997.

A large number of NGOs, cooperating in the Climate Action Network, hope that the countries will decide not to allow a doubling of the greenhouse gases from pre-industrial levels (keep the atmospheric concentrations below the levels, which would give a combined effect equivalent to a doubling of pre-industrial level of CO2 concentrations). Further, they ask the countries to back this up with a strong protocol in 1997 to reduce the CO2 emissions of the industrialized nations after the year 2000.

If the countries decide to stabilize the greenhouse gas concentration at the equivalent of a doubling of CO2 in the atmosphere, the average global temperature will increase to 1.1 - 3.3 C above pre-industrial level. Even this increase can have quite harmful effects to some natural ecosystems.

More info: Climate Network Europe, rue de Taciturne 42, 1000 Brussels, Belgium. Ph/fax:+32-2-2310180/-2305713, email: canron@gn.apc.org.

Commission for Sustainable Development

In April 1996, the UN Commission for Sustainable Development

(CSD) for the first time discussed climate and energy. CSD, which was formed after the Rio-Conference to oversee the implementation of Agenda 21, took up its chapter 9: "Protection of the Atmosphere".
CSD reaffirmed the conclusions in Agenda 21, but did not succeed in more detailed or action-oriented recommendations. Several countries even argued for a weakening of the recommendations of Agenda 21.
Among the NGOs, ISES (International Solar Energy Society) has made recommendations to CSD that could give UN a strong basis for supporting sustainable energy. ISES proposes, among others that the UN-system:
- creates an International Renewable Energy Agency,
- sets goals for energy efficiency and renewable energy (40% renewables worldwide by 2020),
- takes a lead in establishing a system for integration of environmental costs in energy prices, and introduces an international environmental impact fee for energy-related pollution,
- revitalize regional technology centers, and
- in cooperation with the World Bank encourages private investments in manufacturing of sustainable energy products, and the formation of Solar Enterprise Zones, where industrial production is fuelled with renewable energy.

More Info: American Solar Energy Society, 2400 Central Ave. G-1, Boulder, Colorado 80310, USA.
ph+1-303-443 3130, fax+1-303-443-3212, email: ases@igc.apc.org.

Regional Preparatory Conferences:

Asia & Pacific
16-18 Sept., Jomtien, Thailand
Info: Carol Aonuevo,
email: uhmac@unesco.org
Prem Kasaju in Bangkok:
Ph: +66-2-3910577, fax: +66-2-3910866,
e-mail: pkasaju@mozart.inet.co.th.

African
21-25 October, Dakar, Senegal.
Info: Linda King, email: uhkli@unesco.org<%-2>

Latin American & Caribbean
6-8 November, Brazil
Info: Linda King, email: uhkli@unesco.org.

Pan European
12-14 December, Barcelona, Spain
Info: Paul Blanger:
email: uhbpa@unesco.org,
Angela Miguel in Barcelona:
ph: +34-3-4831063, fax: +34-3-4831266.

Adult Education: A Key to the 21st Century

UNESCO, in co-operation with several International Partners, will launch the 5th International Conference on Adult Education (CONFINTEA V) to be held in Hamburg, Germany on 14-18 July, 1997. At this Conference, UNESCO intends to complement previous conferences it has held, (e.g. Elsinore 1949, Montreal, 1960, Tokyo, 1972 and Paris, 1985).

The conference aims at facilitating the participation of all in sustainable development, promoting peace, empowering men and women world-wide, and building a synergy between formal and informal education.

In the context of the adult education 10 themes will be addressed:

1) Challenges of the 21st Century
2) Improving conditions and quality
3) Ensuring the universal right to literacy and basic education
4) Promoting empowerment of women
5) Changing world of work
6) Preventive security: environment, health and population
7) Media and culture
8) Groups with special needs
9) Economics
10) Enhancing international co-operation and solidarity

<%-2>More info: UNESCO Institute for Education Ph: +49-49-448041-0, fax: +49-40-4107723.e-mail:uie@unesco.org or <%-2>UNESCO, Ph/fax:+33-1-45681139/- 40659405, email: e.taylor@unesco.org.

INforSE was invited by UNESCO to take part in the preparations of the conference and has taken a leading role on theme six, adult learning and the environment. It has provided inputs and suggestions to the Conference organisers to better develop and define theme no. 6. The aim is to involve as many INforSE members as possible in the Regional Preparatory Conferences. Several INforSE member organisations, such as INSEDA & Central-European Folk Academy, have already demonstrated an interest in this initiative. INforSE also hopes to co-operate closely in this effort with the International Council for Adult Education (ICAE) and the United Nations Environment Programme (UNEP). The focus of INforSE activities in this theme will be to promote non-formal adult training and capacity building in the area of environment and sustainable/renewable energy development. Decentralised, participatory, and non-formal educational strategies, involving adult groups, will be the focus of all our programmes.

All INforSE member organisations are encouraged to participate and collaborate in this effort.

More info: Rene Karottki or Natascia Petringa at the INforSE Secretariat, Address see on page no. 2.

The Central European Folk Academy (CEFA) and Association for World Education (AWE) invite all members of INforSE to a preparatory meeting for the CONFINTEA V on September 1-4, 1996 at CEFA.

AWE, like INforSE, was asked by UNESCO to take responsibility for a sub-theme of the conference: "Adult Learning and the Challenges of the 21st Century". AWE is very interested to develop a network with INforSE.

More info: Judit Ronai, CEFA, 9400 Sopron, Szt. Gy”rgy u.13,

Hungary, ph/fax+36-99-333 350.

INforSE Participation

NGO Meeting in Hungary

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Regional News - North America
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Blueprint for US Electricity Restructuring

By Angeli Thavendran, EA, USA INforSE North America Coordinator

Initially, restructuring the electric-power industry so that competition could replace monopoly was considered a positive development for both the environment and consumers. Concern has grown recently that competitive pressures could result in utilities' abandoning the pursuit of energy efficiency and renewable energy to cut costs. These fears seem to be justified as utilities throughout the U.S. cut demand-side management (DSM) program budgets, citing competitive pressures.

Despite the obvious advantages of renewable-energy technologies, utilities have remained averse to introduce these technologies. A recent survey by Greenpeace of the nation's utilities found that renewable energy sources account for only 5 percent of 220,000 megawatts of generating capacity that is new or planned for the period between 1990 and 2014. At the same time, it has become clear that the U.S. Climate Change Action Plan, which relies largely on voluntary action from the country's utilities, will fail to meet its commitment to stabilize U.S. CO2 emissions during the period 1990-2000.

In this uncertain phase, before comprehensive restructuring legislation is passed by Congress (scheduled to take place in 1997), utilities are working to increase their market power by merging to gain control of ever larger markets, by investing in risky ventures at home and abroad and by acquiring and being acquired by manufacturers of generating plants and fuels. The consequent loss of political and economic accountability results in minimal consumer choice and control, and increasing environmental degradation.

Environmental Action seeks to ensure that low-income households are not disproportionately burdened by rising energy costs, that renewable-energy growth is nurtured, and that programs for energy efficiency are not abandoned. Together with Public Citizen, the Union of Concerned Scientists, and the U.S. Public Interest Research Group, we are developing a set of principles for utility restructuring legislation that local, state, and national groups can use as a guideline in lobbying for consumer and environmental safeguards. The principles of the blueprint are:

- The transition to a competitive market must offer significant savings to all consumers, including low-income consumers.
- Utility restructuring should not result in a widening gap between the respective rates paid by small and large consumers of electricity.
- Relieving utilities of any liability for damage and losses

caused by their decisions would penalize efficient utilities and consumers. No less than 50% of damages and losses should be recovered from shareholders and no more than 50% from ratepayers.
- Utilities should separate their generation, transmission, and distribution assets into distinct and unaffiliated corporate entities.
- An independent energy agency should be created to ensure independent oversight and administration of energy efficiency, low-income, and R&D programs. This agency would coordinate and adopt measures to ensure that all money collected for this purpose from the electricity system was disbursed through competitive bidding, effectively spent, and directed to high-priority programs that serve the public interest.
- The aggressive pursuit of energy efficiency must not be compromised by the switch to competitive electricity markets. Funds for this should be collected through a system that cannot be bypassed, then disbursed by the Independent Energy Agency. In addition, state-guaranteed access to below-market loans for efficiency improvements would help consumers.
- Funding for energy assistance for low-income consumers must be adequately supported.
- Consumers must be protected against any unfair business practices. There must be full disclosure of each company's resource port folio and environmental impacts.
- States must ensure that adequate support is available to develop and deploy new technologies that increase transmission and distribution efficiency, allow distributed generation, and reduce or prevent pollution, e.g., by a system benefits charge.
- The growth of renewable-energy generation must be a priority for any restructured system. A renewables portfolio standard, applied to all retail suppliers of electricity, should be used to increase resource diversity from current levels.
- Competition must produce improvements in environmental quality. States should consider a range of mechanisms to achieve pollution reductions, including pollution charges.

COSENI

The Consortium of Sustainable Energy Networks International, which was formed in 1994 by INforSE and other networks, held its quarterly meeting on June 19 in Washington DC. Participants discussed the ways in which NGOs and the World Bank evaluate renewable energy projects.

More Info: COSENI, Linda Helm Krapf, PO. Box 677, Long Valley, NJ 07853, USA. Ph/fax:+1-908-8132794/-9790045 email: krapf@eden.rutgers.edu.
"Laugh if you will, but my kind once ruled the earth"

@MINI-2 = Drawing by Ziegler; @ 1991 The New Yorker Magazine Inc. (Copied from M.Bernstein, lecture material '93, Univ. of Pennsylvania, USA)

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Regional News - Africa
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Seeing the Light: Solar PV in East Africa

By Ann Heidenreich, NGONET, Kenya.

Contrary to what many people think, solar PV is not too expensive for ordinary folk.
Hundreds of thousands of rural households in East Africa now pay $5 to $10/month or more for kerosene for lighting and drycell batteries for radios, and small businesses are paying significantly more. These are potential customers for solar PV systems. Small solar systems pay for themselves over a period of one to three years, and after that, savings are significant. In addition, the quality of lighting is far better and the house is free of unhealthy kerosene fumes.
I visited a small business (SuperLife Bar) in Komolo on the Maasai Steppe in Tanzania in early April that had been using 20 litres of kerosene/week at TSh 400/litre (US$16/week; $64/month; $832/year). Late last year, the owner, Mr. Lengai, bought a solar PV system for about $1,000. In just over a year from the time of purchase, he will have recovered the cost of his system and after that, costs for lighting and music in his establishment will be drastically reduced.
With the recent dramatic rise in production and drop in costs, solar PV is already on the market and powering lights and radios in tens of thousands of rural homes in East Africa. There are small entrepreneurs selling PV systems in many villages, and local manufacturers producing system components.
Solar PV has become a new fashion in donor, government and NGO circles. There is a danger that the influx of donor funds will undermine local entrepreneurs who are already in the business. New projects must build on work that has already been done. Mass dissemination of any technology is best done through the market. Donor interventions in the field of solar PV should be aimed at building an infrastructure for market dissemination of solar PV. Support is appropriate for training, demonstration, credit, design, policy formulation and networking.

KARADEA Solar Training Facility, Tanzania, has regular courses supported by EAA (see issue no.11). The next course is 8-28 July 1996.

The 4 As for customer satisfaction:

Awareness
Most people won't buy what they have never seen. Donor funds could be channelled into small, well-maintained demonstration systems in public buildings such as schools, hospitals, libraries and offices. These should be decided upon by local groups, purchased locally, installed and maintained by local technicians.

Availability
Local businesses should be on hand in rural villages to design, deliver, install and maintain PV systems and to instruct customers in operation and maintenance.<%-2> <%-3>Donor funds are needed to establish and operate solar training centres, provide scholarships for trainees, and support credit schemes to start-up small businesses, with the aim of having an electrical shop in every village.

Affordability
Although some people have sufficient cash to buy solar PV systems up front, many people do not. Reduction of import duties, downsizing (not downgrading) of systems to match rural financing schemes are needed to enable many more people to buy solar PV. While systems should be affordable, they should not be given away free or at subsidized rates that undercut local companies.

Appropriateness
Most solar equipment on the market today is not designed for the rural African market. Development banks should give credit to companies for market surveys and redesign of equipment.
In Kenya, various ways to finance solar PV are being tried, supported by the World Bank (ESMAP/GEF/IFC) and/or the Ashden Trust, and implemented by Kenya Rural Enterprise Programme and Energy Alternatives Africa (EAA). Some examples:

- "Solar Energy for Rural Kenyan Businesses" provides loans to qualifying businesses and community groups together with required training and support to establish small, solar-based businesses.
- "Testing of Financing Mechanisms for Solar Equipment in Rural Villages" will be a 3.5-year project.
- Several projects are underway to field test solar lighting and radio systems, particularly solar lanterns. A number of small local companies sell the lanterns at subsidized rates and gather information on customer response. Many of the lanterns being sold are designed for the US camper market, not for everyday use in rural African homes. These surveys will provide valuable feed-back to manufacturers on how to design for the African market, where potential sales are in the millions of units.
- A workshop entitled "Building Renewable Energy Infrastructure in Africa" was held for Development Officers from 18 districts in Tanzania, Kenya and Uganda, 1-3 April 1996 in Arusha, Tanzania. The report of the workshop includes a list of 70 solar PV businesses in East Africa. Copies are available from EAA.

More info: Ann Heidenreich, NGONET, PO Box 76406, Nairobi, Kenya. Ph/fax: +254-2-729447; email: annh@chasque.apc.org; or Mark Hankins, EAA, PO Box 76406, Nairobi, Kenya. Ph/fax: +254-2-565616; email:energy.africa@tt.sasa.unon.org.

The article is compiled from an article in EcoNews Africa (18 April 1996) by Ann Heidenreich, and a paper by Ann Heidenreich and Mark Hankins presented at the World Bank Donor's Roundtable on Energy and Development, April 1996 in Washington DC.

Fuelwood - in Search of Alternatives

By Svend Erik Ladefoged, INforSE Secretariat

During a recent visit to Zimbabwe, Tanzania, and Uganda, I had firsthand experience of the fuelwood crisis afflicting many rural families. In many places, they are rapidly reaching the stage when there will not be enough wood for cooking purposes and for space heating. Why is this?

Oil Crisis & Biomass fuels

First, until the late 1970s, nobody considered the energy consumption of the rural populations. At the time of the independence of the countries, energy planning was of relatively minor concern. The interest therefore centred around electricity, oil, gas, and coal. The large rural populations did not figure in these considerations.

It was not until the shocks of the oil price increases in 1973-74 and again in 1978-80 that attention was paid to the <%-2>energy supply and consumption of rural populations. New studies found that the major supply of energy in these countries came from biomass fuels in the form of wood and charcoal.

Second, one of the myths is that it is mainly the rural populations' use of wood for cooking purposes that has caused the shortages now experienced. Several studies have found that the reasons for the depletion of wood stocks, particularly in rural areas, have to be found in (1) cutting of trees in order to extend agricultural lands, (2) increase in the population, (3) rapid urbanisation, and the subsequent increased needs of the poor masses in the cities for wood charcoal for cooking (4) increased prices of modern fuels. To remedy the situation, agroforestry, intercropping, and the establishment of wood belts around the cities were tried, but have met with disappointing results.

At the same time, agricultural wastes are often lying about without being used. To mention a few: husks from rice and coffee, maize cobs, stems from different plants etc., and sawdust from sawmills. Many of these wastes may be briquetted or carbonised and used either as fodder for animals (some types of agricultural wastes are already being used in this way), or as alternatives for wood or wood charcoal. In this way the felling of trees in rural areas could be significantly reduced.

Charcoal from Husks

"Black Power", a small Ugandan company, has spent the last 10 years developing charcoal made from coffee husks. Their simple, homemade machinery shows that it is possible to produce alternatives to wood charcoal inexpensively.

Another alternative is dried grass burned in a simple, cheap stove resembling the well known improved charcoal stove (jiko).

Last, in many places sawdust is burned off as a waste product. But, sawdust is perfectly suitable for burning in simple stoves.

Judging by conditions in places in Tanzania and Uganda, it would appear that the common feature of these types of alternative fuels is that they are as efficient as or better than wood charcoal.

Furthermore, the indications were that financially these fuels compare well with wood charcoal, when their efficiency is taken in to consideration. Economically, a shift to alternatives or even substitutes for wood or charcoal made from wood will be hard hitting on the many rural households that produce charcoal for the cities. To offset the impact, these families may instead sell/export "processed" (made into briquettes or charcoal) agricultural waste products to the cities.

Such solutions need to be further investigated and developed. The aims should be to (1) assure that competitive uses of the agricultural wastes are avoided within the rural farming

community, i.e., that these wastes are not already being used by the farmers for other purposes, and (2) identify other types of waste products that can be used as substitute fuels, particularly to wood charcoal. Last, but not least, the economical feasibility needs to be analysed.

More info: INforSE Secretariat, see page no. 2.<%2>

Photo: Boys collecting coffee shells to the charcoal stove at Black Power in Uganda.

Photo: Forming ceramic liner for an improved charcoal stove before burning it at Black Power in Uganda.

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Regional News - Asia
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REAP '96, October, Manila

By Sylvia Gilkes, ADA, Hong Kong.

Preparation for the 3rd International Renewable Energy Asia Pacific Conference and Exhibition, REAP '96, is now in full swing. This year, the event will be on 7-9 October 1996 in Manila, the Philippines. It will focus on the Asia Pacific markets of Australasia, China, Indonesia, Japan, Malaysia, the Philippines, Thailand, and Vietnam.
<%-2>The Exhibition is a great opportunity to meet and make new contacts within the whole renewable energy sector.<%-1>The Conference attracts top-level speakers. In terms of marketing strategies, project financing, policies and incentives for the implementation of renewable energy and energy efficiency projects i<%-2>n the Asia Pacific region, one can discover firsthand the latest developments.
<%-2>The event is organised in co-operation with the Philippines Department of Energy which announced that renewable energy resources will be a major focus for its immense Energy Plan. The previous conference in New Delhi, India, attracted 250 delegates from 23 different countries and the exhibition welcomed over 2000 visitors. We are expecting a similar attendance for this event as well.
The participation fee for delegates and exhibitors is a fixed amount. However, we will consider requests for a reduced fee on a case-by-case basis. Attendance of the exhibition itself is free and open to the public.

More info: ADA, Alternative Development Asia ltd. 5/F 3 Wood Road, Wanchai, Hong Kong.
Ph/fax:+852-2574-9133/-2574-1997,email: altdev@hk.super.net.

Wind Pumping Network in India

The concept of wind-driven water pumps is promoted in India by the Wind Pumping Network, a recent formation from December 1995.

It is planned to be run by the Center for Scientific Research (CSR), Auroville. In the coming years, the network hopes to accomplish the following tasks concerning the wind pumps in India:
- improve existing designs;
- influence manufacturers to make the operation and maintenance user-friendly;
- formulate favorable government policies;
- investigate new ways of funding means of soft loans and credit schemes from financial institutions.;
- increase awareness of advantages;
- formulate relevant standards and certification procedures for the manufacture and installation.

Especially the last item is of great importance. Quality matters are essential. Auroville happens to be one of the few concentrations of working wind pumps in a country where a stunning 80% of the installed wind pumps do not work. The network looks at the bright side: with respect to the "12PU500" model, which is particularly prone to failure, the network is interested in the relatively few clusters that actually work and what one can learn from these experiences.
In cooperation with manufacturer AUREKA, the CSR has developed the highly successful, direct-drive, 5.5 m diameter AV-55. This machine was found to be the most cost- effective wind pump being manufactured in India.

Source: RERIC news, vol. 19, 1996.
More info: K. Raghavan, RENCON, E-36, IFS Appts., Mayur Vihar, Phase 1, Delhi 110091 India.email:raghavn.rencon@axcess.net.in.

New Energy Info System in Thailand

The pilot phase of an Energy and Environment Information System (EEIS) was completed in January 1996 in Thailand. The EEIS is designed to provide small- and medium-scale industries with information about energy and the environment.

EEIS, an offshoot of the Asian Institute of Technology, enjoys financial support from the United Nations' branch Industrial and Technological Information Bank, and cooperates with various partners, among others:

- Federation of Thai Industries
- Industrial Estate Authority of Thailand, part of the Ministry of Industry
- Technical Information Access Center
- Commercial Division of the National Science and Technology Development Agency
- Technical Information Services

The present network members, reflecting the necessary diversity of a successful network, reaches more than 4,000 small and medium scale industries in Thailand.

Source: RERIC news vol. 19, 1996. More info: Asian Institute of Technology, G.P.O. Box 2754 Bangkok, Thailand. Ph/fax: +66 252458-66/-70, email: enreric@ait.ac.th.

INforSE Central Asia

The Regional INforSE Meeting '96 for Central Asia,was held on May 29-31, Lucknow, Utter Pradesh, India. It was part of the workshop & meeting "Promotion of Renewable Energy and Ecological Development through Adult Education". A number of recommendations were made for INforSE, for the Solar Summit and for the UNESCO Adult Education Conference.

Raymond Myles was re-elected as regional coordinator for 5 years, while Lalita Balakrishnan was elected as country representative for India, also for 5 years.

More Info: INforSE Central Asia,
Address see on the back page.

Regional News - Asia

Malaysia's Renewable Energy Scene

Excerpted from a report published by Center for Environment, Technology & Development, Malaysia (CETDEM) a Malaysian NGO, member of INforSE.

Solar energy is abundant in Malaysia. Still it has not been very popular. The report, after a 9-month research funded by DANCED Malaysia, identifies the bottlenecks and suggests means to break the impasse.
Malaysia has fossil fuel reserves and plans to extend its grid to the majority of the country. On the other hand, renewable energy is freely available, environmentally benign, and a necessary tool for economic growth and sustainable development. Renewable Energy is an obvious choice to meet the rapidly increasing energy demand.
Renewables' Scene
The solar radiation level is high, ranging from 6.6kWh/m2 in January to 6.0kWh/m2 in August, which is ideal for several applications.
Solar drying is a traditional method to process food like coffee, pepper, paddy; to store fish and fruits; to process tobacco. The farmers dry their products under the sun on cement or on trays. The consumers accept the quality and taste of such products. Driers are used only when they want to reach acceptable export standards, e.g., for cocoa, tea, and food products.
Solar water heaters (SWH) have been commercially available since the late '70s. There are companies that are involved in manufacturing, assembling, and marketing the system. In 1990, an estimated 5,460 units were in use, and a 15% annual growth rate was expected. SWHs have achieved market acceptance without extensive promotional activities. SWH is seen as a symbol of

modernity. Its visibility to others enhances the owner's self-image. The major problem is that only 3% of households have income capability to buy it.

The PV system usage for telecommunication stations is well established, but it has not got popular among the public like the SWHs. This is due to problems with systems installed in the 80s; high, increasing energy demand cannot be met with small systems; and the fact that the utilities are expanding the grid rapidly. However, there are about 60 villages where PV installations are planned for 1996/97.

The palm oil industry is rapidly expanding. Presently, there are 2.4 million ha of plantations processed by 271 palm-oil mills. Renewable-energy utilization is a well established part of the industry's success stories. The energy from the residues is used to power improved technology.

The natural rubber output of Malaysia, one of the world's leading producers, was 1 million tonnes in 1995. The rising demand from the furniture industry decreases the residue's usage as fuelwood and charcoal for the steel industry, which is 30,000t/yr.

The rice straw and husks are used for soil conditioning, but the rice wastes disposed of on-site at the rice mills has potential for energy use in cogeneration systems.

Biogas usage at pig farms is limited. The waste is not treated, just washed away in the waterways.

The forest residues are not considered economic to transport. Sawmill residues are used for making wood briquettes. An ASEAN-EC COGEN program gave RM3.6 M to fund 6 demonstration cogeneration plants.

The hydro power potential is significant. 39 mini-hydro plants are in operation from the 125 planned during the 4th Malaysian Plan.

The wind power potential seem to be more viable at off-shore islands, but it has not been assessed yet. The first wind turbine was installed in 1995 with a capacity of 150kW for electricity and desalination of sea water.

Need for Action

There is a lack of awareness in many areas of renewable energy utilisation among the policy makers and the public as well. The lack of policy to give incentives to develop and utilize renewable energy resulted in a lack of coordination in terms of research and application. Further, the large subsidies on conventional energy reduces the interest for alternatives.

CETDEM has proposed a number of actions to overcome the barriers for renewable energy, including:

- Publicise renewable energy efforts and success stories via conferences and the mass media,
- Get the benefits of renewable energy endorsed by the Prime Ministers Economic Planning Unit, to make the state institutions use more renewable energy,
- Identify local organizations with valuable experiences in the field,
- Identify and encourage organizations that would like to train staff to work for renewable energy; and organize courses for this group,
- Form a "Clearing House" to collect and disseminate information on renewable energy,
- Initiate discussions among government, industry and NGOs on

legislation and economic incentives to promote renewable energy.
- Meet the needs for demonstration plants, information and education .

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TABLE: Renewable Energy, 1994

	Use	Potential
- Palm Oil:	75.7 PJ	155.5 PJ
- Rubber wood:	15.0 PJ	40.5 PJ
- Forest Resid.	7.5 PJ	22.5 PJ
- Solar:	0.23 PJ	9.1 PJ
- Minihydro:	0.17 PJ	-
- Wind:	1260 MJ	-
- Livestock:	9362 MJ	3x10^8 MJ
- Padi:	3062 MJ	5.7PJ
- Total:	98.6 PJ	

- Primary Energy Supply '94 [PJ], (Chart)

Regional News - Latin America

3rd Meeting for Renewable Energy in Brazil

By Emilio La Rovere, Brazil, INforSE-Latin America Coordinator

All Latin American NGOs involved with sustainable energy development, present or potential members of the INforSE, are invited to meet in Sao Paulo, Brazil, from 25 to 29 June, 1996, during the 3rd Meeting for Development of Solar, Wind, and Biomass Energy in Brazil.
The meeting is promoted by the Permanent Forum of Renewable Energy - Solar, Wind, and Biomass, constituted by both governmental and non-governmental organizations. It is supported by Brazilian Ministries (Mines and Energy, Science and Technology, Foreign Affairs), Sao Paulo governmental bodies, utilities, the Reference Centre on Solar and Wind Energy (CRESESB) hosted by the Electric Power Research Centre (CEPEL), industry (manufacturers of renewable energy equipment) and the universities from Rio de Janeiro (COPPE/UFRJ) and Sao Paulo (USP, UNICAMP).
The place of the event is at the Museum of Modern Art.. Its program is:
- Opening Ceremony at the Bandeirantes Palace.
- International Workshop on Strategic Agreement for the Development of Solar, Wind and Biomass Energy, including a Poster Session of Technical Papers.
- Dedication Ceremony of the Solar Thermal Water Heating System of the Popular Housing Project "Cingapura", city of Sao Paulo.
- First Solar-Thermal Companies' Meeting.

- International Renewable Energy Technical Exhibition at Ibirapuera Gardens.
More info: Ana Lucia Nadalutti, IED, Instituto de Ecologia e Desenvolvimento or Emilio La Rovere, COPPE/UFRJ, INforSE-Latin America Coordinator, Brazil. (See at backpage)

First Big Wind Power Plant in Costa Rica

In May 1996, the construction was completed, and the first big wind-power plant is in its testing phase in Costa Rica, where, depending on the location, the annual average wind speed is 10-11m/s.
The 20-MW plant with 55 KVS-33 wind turbine generators, supplied by Kenetech of the USA, will help to meet the country's growing electricity needs in an environmentally friendly way. In addition, it will save the country an estimated $3.8 million a year in imported fuel oil that it would have needed had it relied on fossil-fuel for additional power. The current price of electricity is 5-6 cents/kWh. In Costa Rica, the total installed capacity is about 1,000 MW, most of which is hydroelectric. The plant will be owned and operated by Plantas Eo'licas S.A., sponsored by Grupo Zeta, a Costa Rican industry group, and Charter Oak Energy, a subsidiary of Northeast Utilities of the United States.
The project is probably "the first commercial-scale, privately owned and operated wind power park project in the world to be built without economic incentives of any kind". The Inter-American Development Bank (IDB) approved the $18.7 million loan in December, 1995. The facility will be located at Tejona, canton of Tilara'n, Guanacaste province. Adjacent to it, a similar wind-power plant is being considered by the Costa Rican Government and would be built by the Instituto Costarricencse de Electricidad, the national power company. That sister plant is also being financed in part by an IDB loan and a $3.3 million grant from the Global Environmental Facility, whose trustee is the World Bank.

Source and more Info:
Christopher Hunt, president of PESA, Plantas Eolicas S.A, c/o Merrill International, 20 University Road, Suite 510, Cambridge, MA02138, USA Ph/fax: +1-617-661-9540/- 661-9244.
Samuel Silva, IDB Press Officer, 1300 New York Ave, NW Washington. D.C. 20577, USA.Ph/fax: +1-202-623-3731/623-1419, email: samuels@iadb.org.

Small Wind Mills in Peru

Wind energy is not unknown in Peru. Several type of small wind battery chargers and wind pumps have been installed there since the 70's.

Wind Battery Chargers

Peru has a long tradition in design and manufacturing of wind

generators, most of them using a 12-V car alternator to charge batteries. The most effective system is the three-bladed Waira (which means "wind" in the Inca language Quechua). 25 of them are installed in Peru. They are available in 2 sizes: 700 W (US$ 1950) and 1200 W (US$ 2250).

Wind Pumping
Irrigation using wind energy is attractive to the farmers along the desert coast, near the valleys, where the underground water is 5-40 m below ground and the area is without water for at least three months every year. The prices of the Peruvian, Dutch, American, and German-improved Peruvian irrigating wind pumps range from US$ 1,200 to US$ 3,500. Most of them have the capacity to irrigate 2-3 ha.

Maintenance
Many windmills installed are out of use because of insufficient maintenance due to lack of credit to wind pumps. However, recently, farmers' interest has revived due to the increased fuel prices (4 times increase 1985 - 1996). This makes wind pumping more competitive, but short- and medium -term credits for investment are needed very much. There is also a demand for wind pumps to be bigger and suitable to deeper wells or windmills which work most of the time and store water.
Sources: RERIC News, 03.'95; 03.96. Articles by GRUPO, Peru.
Info: R.Bisetti, see page 13.

First Big Grid-Connected Wind Turbine in Peru

By Romulo Bisetti Solari, CENERGIA, Peru

Peru is located on the Pacific coast of South America. The Andes mountain chain crosses the country from north to south, and almost one-third of the country's land is covered by the Amazon rain forest. However, the main cities are located in the valleys that cross the more than 2000 km of narrow coastal desert. Lima, the capital city, is located on the coast and has 7 million inhabitants, almost one-third of the total population.
The total power-generating capacity installed in Peru is about 4,000 MW, of which 3,250 MW is hydro and the remaining is thermal, fuelled by oil. The hydro energy is coming from waterfalls in the highlands, far from the main demand points. The electricity consumption is less than 600 kWh per capita, and no more than 50 % of the population has electricity. The growth of the GDP, due to the successful economic programme of the Government, creates demands for more energy. The increased need is to be met, in the short term, by new thermal power plants. The Ministry of Energy and Mines has a National Electrification Plan that promotes sustainable energy for the middle- and long terms. According to that goal, over the last two years, it has been financing a number of renewable-energy projects in small and large applications, for grid-connected as well as isolated systems in rural areas, in order to improve the availability of electricity. Some wind measurement studies have shown that the coast of Peru has significant wind energy resources. There are several places with 6 m/s annual average wind speed, and some with over 8 m/s.

The latter case applies to Malabrigo, which has 8.7 m/s annual average wind speed. Malabrigo is a port located 600 km north of Lima, near the Trujillo City, the location of the first successful grid-connected wind turbine in Peru. It is a Danish MICON Wind Turbine, with a rating of 250 kW, hub height of 30 m, three-bladed rotor of 28.8 m diameter, and radio remote control system. This project was financed by the Ministry of Energy and Mines (MEM), supervised by Centro de Conservacion de Energia y del Ambiente (CENERGIA) on behalf of the MEM, and carried out by MICON Argentina S.A.

In Spanish, Malabrigo means "the place where you can't keep warm because you are not able to keep your coat and hat on" This place is very popular with summer surfers, since the strong winds produce large waves. Malabrigo has 1,614 households (7,653 inhabitants). There was a diesel generator set installed there to which 49,3 % of the households were connected, but most of time the gen set was off because of the lack of fuel and "they used to have no electrical service". For many years, Malabrigo has waited for connection to the grid. Now, a 34.5-kV line 17 km long has been installed for the wind turbine connection, and the Malabrigo people's dream has came true.

The Ministry of Energy and Mines is interested in promoting more sites for wind farms on the coast, due to the wind energy available and the need for electricity. Wind power is a good alternative source of energy for the big coastal cities. It would reduce the fuel consumption of existing thermal power plants. The wind farms could support the grid during dry seasons, improving the reliability of the system.

Like Malabrigo, many other towns could be connected to the main grid if they took advantage of their wind resources. Their potential net contributions of wind-generated power could attract the grid to them. Otherwise, they remain isolated, since they cannot finance the connection themselves.

CENERGIA, Centro de Conservacion de Energia y del Ambiente, is a non-profit organisation whose main shareholders include the Ministry of Energy and Mines, Electroperu (National Power Company), Petroperu (National Petroleum Company), the SNI (National Society of Industries) , and COFIDE (National Development Bank). The mission of CENERGIA is to achieve sustainable development in the energy sector. The main activities are training, advertising, and studies.

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Regional News - Europe

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Chernobyl: Close Down?

During the "Chernobyl + 10 years" campaign, thousands of people protested against Chernobyl and other nuclear power plants. One specific demand was to close the remaining reactors at Chernobyl, which are some of the most dangerous.

In the early '90s, the Ukrainian parliament was already demanding

that Chernobyl be closed, but the economic crisis in Ukraine and pressure from the Ukrainian nuclear lobby have delayed these plans. Since 1994, support for the closure of Chernobyl has been negotiated between Ukraine, the G7 countries, and the EU.
The first proposal, to replace Chernobyl with gas-fired power plants, was rejected by Ukraine to avoid increasing dependence on natural gas from Russia. The next proposal, to replace Chernobyl with two nuclear reactors of the Russian VVER 1000 type, is currently under negotiation.
Ukraine is also reluctant to accept this proposal as it will be difficult to pay back the international loans of more than $2 billion US that are part of the proposal, and because the funding is not sufficient for a total and safe shutdown of Chernobyl.
Unfortunately, no proposal has been made to replace Chernobyl with the cheaper solutions of more efficient use of electricity and of the use of renewable energy where, e.g., small hydro and wind are cost-effective options.
An NGO initiative, based on the "Chernobyl + 10 years" campaign, is now working on an alternative plan to be presented at the G7 meeting on June 26 in Lyon, with subsequent continuing refinement. Support of and participation in this work are welcome.

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Wind Energy, Ukraine

By Gunnar Boye Olesen, OVE, INforSE - Europe

There is great potential for windpower energy in Ukraine. If, for instance, the 2,700 sq.km. of shallow waters in the Black and Asovsk Seas were used for windturbines, this would cover the entire electricity consumption of Ukraine.
After the Chernobyl accident, several attempts were made to develop windturbines in Ukraine. The most successful has been the joint venture Windenergo. It was created as a collaboration of a number of former military companies that have the necessary manufacturing facilities and a USA-based company, Kennetec Windpower. Their first type of windturbine is a 107-kW turbine, of which three started their operation in May 1993. Now 60 of these turbines are running near Donuzlav Bay in Cremea. A new model of windturbine has been developed with a capacity of 250 kW. Three turbines of this type are now in operation.
Beside the Ukrainian windturbines, the Windenergo produces parts for Kennetec windturbines operating in the USA, which is partly financing the involvement of Kennetec.
The price for each turbine was initially $23,000 US, well below world market price. Now the price is $50,000 US, which is close to world market price. The price increase is due to higher overhead costs of the companies because of a decreased of other production. Increased competition and restructuring are expected

to bring prices down again.
The wind-electricity is produced at 2.0 US cents/kWh and sold for 2.4 US cents/kWh to the power company. The consumer price is 3.1 US cents/kWh.
In 1994, the government of Ukraine created a fund for construction of windturbines. The initial goal was to finance 100 MW of windturbines. Since then, the decision has been made to support additional development using part of the national tariff on electricity.
Thus, 0.5% of consumer electricity payments, equal to $15 million US annually, will be allocated to the fund. The official Ukrainian energy plan includes the installation of 2000 MW windturbines by the year 2010. This will cover 10% of the Ukrainian demand for electricity.

The above article is based on information from Prof. Boris Koropko of the Institute of Nontraditional Energy, Kiev, Ukraine, and on the article, "Using Wind Energy in a New Way", Ukrainian Business Journal 8/95, by Director Lev Dulnev, Windenergo Ltd.

107-kW windturbines at Donuzlav, Cremea, Ukraine.

Energy-Crops in the EU, Conference Sept '96

The First European Energy Crops Conference will be held on 30 September and 1 October 1996 in Enschede, The Netherlands. The conference, supported by DG XII of the European Commission and Novem (Netherlands agency for energy and environment), will give a concise picture of how energy crops are used and which parties are using them, and will cover agricultural, technical, environmental, energy, economic, and institutional aspects. During the conference, examples of energy-crop projects throughout the EU and the European Energy Crops Overview Report will be presented.

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Environmental Labelling of Electricity

Environmental Labelling of Electricity
With the new liberalization of the Swedish electricity system, a new way of consumer pressure is under development. The Swedish Society for Nature Conservation has set a number of criteria for environmental labelling of electricity contracts. Only contracts for electricity from renewable energy sources can get the label, and for hydro-power only if the contract do not imply development of new hydro-power. Just 5 month after the liberalization, about 15 TWh of the electricity equal to 10% of the Swedish electric consumption is sold on contracts with the environmental label. The labelled electricity is sold at 10 - 20% higher prices than other electricity. If the success continues, it will increase the

push for renewable energy other than hydro-power, and reduce the income of Swedish nuclear power plants.
More Info: Swedish Society for Nature Conservation, att. Thomas K†berger, Institute for Physical Resource Theory, 41296 G”teborg.Ph/fax: +46-31-7723129/-7723150, email: frttk@fy.chalmers.se.

INforSE - Europe Meeting,
June 30, Copenhagen

As announced before, the 1996 INforSE - Europe meeting will be on June 30 in Copenhagen, at Blegdamsvej 4, 1-5 p.m. On the agenda will be a number of proposals for joint activities, such as:
- coordinated inputs to EU energy discussions. We can only influence the EU Commission before the decisions are made if we act together.
- joint participation in the Solar Summit preparations, and formation of a North - South working group (if we need such a group?).
- joint applications to the Regional Environmental Center in Budapest, which just declared new interest in NGO energy activities.
The INforSE - Europe coordinators, Emil Bedi and Gunnar Olesen, hope that many INforSE organizations will participate. For those organizations that cannot come, it is hoped that they will send a written statement.

The City as an Organism, July 1-7, Copenhagen
While more than 125 participants have already signed up for the "City as an Organism Conference" in Copenhagen, there is still space available for more. No more grants can be made for free participation, however. These were available to Central and Eastern European participants. The participation fee is DKK 1,000, (DM 250).

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Mochovce Comes?

After the EBRD (European Bank for Reconstruction and Development) gave up financing the new Mochovce nuclear power plant in Slovakia, many believed that it was the end of the project. This turned out not to be the case. An agreement was signed in April, 1996, where by Skoda, Siemens, Framatome, Atomeneregoexport (Russia) and others shall finish the plant with funding from Czech Banks (state-owned), from the German Kreditanstalt f r Wiederaufbau with a guarantee from Hermes, the German state-owned export bank, and from Societe Generele Paris. In this model, Mochovce can be built as a state-to-state business, with the Slovak state taking the majority of the risk. The Mochovce Campaign asks protests to be send to Siemens, and especially, for Germans, to the Hermes Bank.

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Energy 21 in Denmark
A new energy action for Denmark has been approved by the Parliament. The plan confirms the existing target of 20% CO2 reduction for the period of 1988 to 2005, and sets a new long-term aim of 50% CO2 reduction by 2030. This shall be met with vigourous energy-efficiency measures and an increase in reliance on renewable energy from 8% today to 35% in 2030. The plan was welcomed by many NGOs for its realistic attitude towards environmental problems, in line with recommendations of the IPCC, the UN scientific panel on Climate Change. It has been criticized by NGOs for not having strong enough measures to reach the goals, and especially for lack of measures to stop the increasing CO2 emissions from traffic.
Info: Danish Ministry of Environment and Energy, H›jbro Plads 4, 1200 Copenhagen K, Denmark.

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Plus - Energy House in Denmark
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By Lars Yde, Folkecenter for Renewable Energy, Denmark

The Plus-Energy House Concept

Low-Energy Houses are increasingly common nowadays. Zero-Energy Houses are still in the experimental stage. The idea of a Plus-Energy House was originally introduced by the Danish engineer Jean Fischer, and later, the Folkecenter for Renewable Energy took it up from a different angle. We not only wished to build a house that produced more energy than it consumed, we also wanted to create a quite new concept of a house. It would be a house in which you, so to speak, take the garden, or rather the greenhouse, indoors during the winter time, and thereby create subtropical surroundings in the dwelling house. A winter garden. The dream of all Scandinavians, but, with current techniques, a nightmare with regard to energy consumption.
Since 1985, the Folkecenter for Renewable Energy has worked on a greenhouse concept based on mobile insulation (bead wall layer) with control of air humidity and regeneration of solar heat by means of a heat pump. This work has formed the basis for development of the Plus-Energy House concept and of the project to build a Plus-Energy House.
Around the beginning of this year, the building of the Plus-Energy House was finished at the Folkecenter for Renewable Energy in Denmark.
The house was built from conventional building materials. It is to function as a combined greenhouse and office building. A 240-m^2 glass roof facing south allows sunbeams to get in and heat the concrete floors, walls, and ceiling.
After only few hours of sun, the house is heated up. With the mobile insulation (polystyrene "flamingo" beads) in the glass

roof, it can manage without solar energy for about two days. The glass roof consists of two layers of tempered glass. It is possible to fill the 20-cm space between the glass plates fully or partly with polystyrene beads. This gives the glass roof an insulation value comparable to that of an outer wall of a low-energy house. The flamingo beads provide the mobile insulation. They are moved with the use of air blowers to provide appropriate insulation, day or night. During daylight hours, they can shade the house; at night, they trap the heat, keeping the house warm.

Energy Process

Half of the house is used for growing greenhouse plants. The plants, e.g., fruits, vegetables, and flowers, evaporate water. The energy in the water vapour (evaporation heat) is an important part of the heating system.

When the sun shines on the plants, evaporation will increase. Just below the ceiling, plastic "condenser" pipes have been mounted and filled with cold water. Water vapor from the plants condenses onto the pipes and transfers heat energy to the water within the pipes. The condensation drips off the pipes into a gutter that leads the water back to the plants.

The water in the pipes is circulated to the cold side of a heat pump. From the hot side of the heat pump, heated water is sent out into the heating system of the house and out of the house for sale in the form of district heating. The mass of plants, or rather, the total leaf area, serves as the solar collector in the system. From here, the evaporation occurs, and it is here that the solar heat is converted to evaporation heat. The heat is released later, when the water vapor is recaptured by the condenser pipes. Therefore, the heat-producing capacity of the heat pump is determined by the leaf area of the plants and their ability to evaporate water.

Energy - Economics

On the basis of the now-complete data acquisition, it can be concluded that one can build a house that consumes the same quantity of energy as other houses of the same size, and that at the same time, produces energy at the rate of 300 kWh/m^2/year. This corresponds to what a solar collector produces per m^2 under Scandinavian conditions.

The project has also proven that a Plus-Energy House can be built for a price per square meter that does not exceed 6,000 DKK, the normal price for Danish houses. The direct pay-back time of the energy plant (heat pump system, silos, pipes, and blowers for the mobile insulation) is calculated to be 3.7 years. Meeting Danish standards for fire prevention increases break-even time to 5.8 years. The house, which has 400 m2 floor space, produces 75,000 kWh of heat per year, which would cause an emission of 20,000 kg of CO2 if produced from fossil fuels. The energy consumption, which is covered by a 22-kW windturbine, amounts to 50,000 kWh per year.

Gardeners' Support

The Plus-Energy House project originally started as a greenhouse project, but due to lack of interest in the concept from the side of the gardeners, the emphasis of the project was shifted towards the use of this technology for, e.g., houses, business premises, swimming baths, and winter gardens. In the decade since, gardeners have shown increasing interest in environmentally benign growing methods. These gardeners differ from traditional

greenhouse gardeners in their view of energy consumption. Now, it looks as if the project is returning to its starting point. The Board of Organic Agriculture under the Ministry of Agriculture and Fisheries, the Danish Directorate for Development in Agricultural and Fisheries, has granted 686,000 DKK for further development of the concept to a low-energy greenhouse for growing of organically grown cucumbers and tomatoes.

- Technical Data of The Plus Energy House
- Ground floor: 10x20 m = 200 m^2
- Floor area: 400 m^2
- Window + door area: 22 m^2
- Walls: 125 mm leca concrete 1,500 kg/m^3
- Floor separation: 240 mm concrete 1,500 kg/m^3
- Insulation, roof facing North: 200 mm, lambda = 0.039
- Insulation, walls: 200 mm, lambda = 0.039
- Insulation, floor: 75 mm, lambda = 0.035
- South facade, area: 20x12 m = 240 m^2
- South facade, rafter: laminated wood 200x60 mm
- South facade, glass: tempered glass, 2 layers of 5 mm
- Mobile insulation: polystyrene, › 3-5 mm, 50 m^3

- The heat pump
- Electrical power: 5 kW
- Cold effect: 10 kW
- Heat effect: 15 kW
- Cold storage: 20 m^3
- Heat storage: 20 m^3
- Radiators (surface): 50 m^2
- Condenser: 600 m, › 50 mm PVC

- Plant light: 14-24 sodium lamps, 400 W each.
- Annual import of electricity: approx. 50,000 kWh.
- Annual export of heat: approx. 75,000 kWh.

More Info: Lars Yde, Folkecenter for Renewable Energy, PO Box 208, 7760, Hurup Thy, Denmark.
Ph/fax: +45-97956600/-97956565.

Pictures above and down: The mobile insulation consists of polystyrene, 3-5 mm 'flamingo beads' between the 2 layers of the glass roof. The insulation is moved with air blowers to provide appropriate insulation day and night.

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Estimation of Renewable Energy Potential - Short Guideline
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By Gunnar Boye Olesen, INforSE-Europe Coordinator.

The article is an abbreviated guideline for quick estimates of renewable energy potential, based on the European project "Partnership for Assessment and Support of Renewable Energy Solutions". The project was a cooperation of a number of INforSE-Europe organisations. It was supported by the EU Phare Partnership Programme, FED in Denmark, and others.
Biomass from Forests
Many commercial forests have unused potential for energy in the

form of woodchips or firewood. From forest statistics it is possible to estimate the theoretical potential. This should be reduced to the practical, environmentally acceptable level of extraction, considering the nature of the forest and un-official extraction by the local population.

Industrial wood waste

In sawmills, pulp mills, and all wood-processing industries, residues are made that can be used for energy purposes: bark sawdust, edgings, chips, etc. An analysis of 7 European countries shows that 30-70% of wood-industry residues are used for non-energy purposes like paper and fibreboard.

Larger residual pieces can be chipped for use in wood-chip boilers, while sawdust can be burned in special furnaces or compressed into wood pellets or briquettes that can be used in smaller furnaces and ovens.

Many wood industries use wood residues to meet their own energy demands, but surpluses are often available at low or no cost.

Agricultural crop residues

Straw and prunings of fruit trees, as well as wine- and olive oil residues, are among the agricultural residues that can be used for energy purposes. In Northern and Central Europe, straw is by far the most important, and is used in large quantities in some countries. The straw surplus varies greatly from year to year, depending on weather.

Straw surplus can be ploughed into the field to enrich the soil. When this is needed for a sustainable agriculture, less surplus straw will be available for energy. Pesticides and salty winds can leave unwanted chlorine compounds in the straw in certain situations.

Energy Crops

Agricultural overproduction and setting the land aside are now common in the European Union and can be expected in Central and Eastern Europe as well. This set-aside land can be used for different purposes, one of them being energy-crop production. Promising crops which can be planted for energy purposes in Europe include short-rotation trees (coppices of various willows and poplars), Miscanthus, and Sweet Sorghum.

Other promising energy crops include plants that can be processed for liquid fuels, e.g. rape seeds for bio-oil.

Biogas

The largest potential for biogas is in manure from agriculture. Other potential raw materials are include organic, bio-degradable waste from industries, in particular wastes from slaughter-houses and food-processing industries, sludge from waste-water treatment, and organic household waste. Care should be taken not to include waste with heavy metals or harmful chemical substances when the resulting sludge is to be used as fertilizer, which is usually the case.

Wind

In sufficiently windy areas where little conflict exists with human settlements (noise) or natural life (bird-protection areas), the wind is one of the most environmentally benign energy sources. The energy in the wind is highly dependent on the average wind speed of the site, which depends on altitude,

the regional wind conditions, and local obstacles. Sites with average wind speed below 4 m/s at a height of 10 m are not considered viable for larger wind turbines, at least in the near future, while in areas with wind speed above 7 m/s at a height of 10 m, wind turbines are cost-effective compared with most alternatives. Many areas still lack good estimates of wind potential, and such estimates can be quite expensive to make. Simple estimates can be based on averages of meteorological measurements, but they give quite rough results.

Solar Heat

The most environmentally benign form of energy is probably direct use of solar heat. The largest factor limiting its use is not the amount of the resource, but the demand that can be covered with present technologies. Solar hot water heaters are successful because the steady hot water demand during summer can be met with just one day's accumulation of heat.

Employment

Most renewable energy solutions generate more jobs than do solutions that use fossil fuels. The following table contains overviews of the direct employment in jobs resulting from some of the proposals. In "direct employment" we include jobs in manufacturing, installation, operation, and maintenance, as well as jobs in suppliers of goods and services. The wider societal employment effects of the activities such as the effects of increased income, are not taken into account here. Such effects are generally positive where societal costs and/or imports are reduced.

Figures are new, full-time permanent jobs in the construction, operation, and maintenance of renewable energy technology to generate 1 TWh annually of energy with current Western European technology; except for small hydro, where the figure reflects job-years to install hydro-power to replace 1 TWh annually.

Slovakia

Using the above-mentioned methods and local data we estimated the renewable energy potential in Slovakia. The figure shows potentials for renewable energy to deliver a total of 30.1 TWh/year with currently used technology in Europe. This is equal to 13% of the country's energy demand of 230 TWh/year. The potential for solar energy, estimated at 0.1 TWh/year, is not included in the figure.

This article is based on the report "Guideline for Estimation of Renewable Energy Potentials, Barriers, and Effects", which is available from INforSE - Europe.

- Employment potentials

- Wood from forests: 450 jobs/TWh
- Agricultural waste (straw): 350 jobs/TWh
- Biogas: 560 jobs/TWh
- Wind turbines 300 jobs/TWh
- Solar heating 700 jobs/TWh
- Small hydro 30,000 job-years/TWh

Slovak Renewable Energy Pot. [TWh] (Chart)

Evaluation methods:

- Unused potential from commercial forests
Method 1: Estimate theoretical available wood volume (in m^3 of solid wood, including bark) in terms of annual growth of the forest (from forest statistics) minus annual removals. To estimate net potential reduce the first amount by the estimated volumes of unofficial use and of branches that must be left in forest for ecological reasons; often a 50% reduction is appropriate. Estimate energy content from the wood's density (e.g., 600 kg/m^3 for pine & spruce, 800 kg/m^2 for beech, both at 20% humidity) and lower heating value (e.g., 4.2 kWh/kg at 20% humidity for most trees).

Method 2: When forest growth statistics are not available, estimate the real potential as a fraction of annual removals. With European forest practices, a volume equivalent to 25% of the timber production (including bark) is available for wood chips.

- Waste from wood industries

Method 1: Evaluation of wood residues can be based on trade statistics of non-energy wood and wood products compared with total removals from forests. The difference is available for energy purposes, and is probably to some extent already used as such in wood industries.

Method 2: One rule of thumb is that residues in general are 25-35% of total forest removals, and, of these, 30 - 70% is often used for non-energy purposes.

- Agricultural crop residue: straw

Method 1: Produced amount of straw (in tons) is estimated from agricultural statistics. The total amount should be reduced to the fraction that is available for energy (up to 59% in Denmark, about 35% in Northern Bohemia). Energy content is about 4.1 kWh/kg at 15% humidity.

Method 2: If agricultural statistics do not include straw, a crude estimate can be made by setting the amount of straw (in tons) equal to the amount of grain.

Energy Crops
When the available area and type of land are known, the annual yields can be estimated, e.g., by using the following average annual yields per ha for better soil in Central Europe:
- Salix (Willow): 15 dry tons = 67 MWh
- Miscanthus (Elephant grass): 20 dry tons = 94 MWh
- Sweet Sorghum: 25 dry tons = 125 MWh

Biogas
Method 1: Estimate the amount of available material and the solid

fraction of the material (solid fraction is about 20% for cow manure, 25% for pig manure, and 6-10% for manure in the form of slurry). Per tons of dry material, the biogas and energy production will be about 300 - 450 m^3 of biogas and 2000 - 3000 kWh, depending on material and biogas process. Production yields are usually high from fatty materials, slaughterhouse waste, and pig manure and lower from cow manure and wastewater sludge. Reduce estimate by 20% to account for heating of the process.

Method 2: From the number of animals one can estimate the amount of manure, depending on the race and species of animal, and fodder. For Denmark and the Czech Republic, the amount of biogas and energy is estimated to be:

- Milking cow: 1.2 - 1.7 m^3/day, 2,500 - 3,500 kWh/year
- Sow: 0.3 - 0.45 m^3/day, 630 - 970 kWh/year

(Energy estimates are for animals kept in a stable all year, and have been reduced by 20% to account for biogas process heat.)

Wind

When the average wind speed is known, the available wind energy can be estimated, e.g.:
With 4 m/s average wind at a height of 10 m and with some obstacles (as at a Danish inland site), wind turbines on 1 km^2 can yield 6.4 GWh/year.
With 7 m/s average wind at a height of 10 m and with no obstacles (at sea or at windy mountaintop location, wind turbines on 1 km^2 can produce 23 GWh/year. (One km^2 can accommodate 16 wind turbines of 450 - 500 kW capacity. In Denmark, the average wind at a height of 10 m varies from 4 m/s at a fair inland sites to 8 m/s at sea. In the Czech Republic, this figure varies from 2.5 m/s below 600 m altitude to 7 m/s at 1500 m height (both at sites with few obstacles).

Solar Heat

Solar heating (standard systems) can cover (figures for Northern / Southern Europe, respectively):
- 60% / 80% of hot water heating in households
- 25% / 50% of space heating in households
- 10% of district heating to households for Northern Europe (with 12 -hour storage tank)
- 100% of heating of pools in summer.

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Publications

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An Overview of Energy Programmes in Selected Multilaterals.
A survey of energy programmes within the UN-System & the World Bank, which can support NGO energy projects in developing countries.
By Natascia Petringa. 112 p. 1996.
Access to EU Funding. A Guide to programs of interest to NGOs working with Renewable Energy in the Third World
By Jacob Ulrich. 38 p. 1996.
Contact: Forum for Energy and Development,

Landgreven 7, DK-1301 Copenhagen K,
ph.+45-33121307, fax+45-33121308,
email INforSE@INforSE.dk

Photovoltaics in Buildings: A Design Handbook for Architects, Engineers
Components, methods of integration into residential and commercial buildings, system design, and installation and maintenance. Japanese, European, North American contributions. Detailed drawings and data about grid-connected and stand-alone-systems.
By Friedrich Sick and Thomas Erge. 288p, œ50/$75, 1996.
The Climatic Dwelling: An Introduction to Climate-responsive Residential Architecture
How to combine comfort, environmental concerns and aesthetics. Beautiful and informative illustrations of European houses responding to the climate - from Andalusian to temperate. Also available as a 'resource pack': booklet, floppy disc, and posters.
By E. O'Cofaigh, J.A. Olley, and J.O. Lewis. 176p, œ30/$50, 1995.
Contact: James & James Publisher
Waterside House, 47 Kentish Town Road, London NW1 8NZ, UK.
Ph/fax: +44-171284-3833/3737.

New Directions: Ten Years after Chernobyl. Report and Recommendations to the Leaders of Russia and the G-7 Nations
Includes NGO views on sustainable energy, nuclear weapon reductions, safety and democracy, especially in Central and Eastern Europe.50p, 1996. In English and Russian.
Contact:
- Center for Russian Environmental Policy, Leninsky Prospecty 33, Room 326, Moscow, Russia 117808.
  Ph/fax: +7-095952-2423/-3007.
  Email: anzuz@glas.apc.org.
- Natural Resources Defense Council, USA.
  Ph/fax: +1-202783-7800/-5917.
- Bellona Foundation, Norway. Ph/fax: +47-2238-2410/-3862.

A Fingerbook Guide to Stopping the Western Nuclear Industry's Expansion in Eastern Europe.
Info of nuclear power plants in Eastern Europe, alternatives, list of info sources, groups working to phase out operating plants or stop unfinished reactors.
In English, translated to German: Global 2000, Bulgarian: For Mother Earth; Russian: SEU; Ukrainian: Neka; Swedish: WISE Stockholm; Hungarian: Energy Club; Czech: Hnuti Duha; Slovak: Za Matku Zem; Sloven: ASTE.
Contact: Paxus Calta,
Global 2000, Flurschuetzstr. 13, 1120 Vienna, Austria.
Ph/fax: +43-1-812-57300/-5728,
email: C+10@t0.or.at.

10 Years After the Chernobyl Disaster: Electricity in Eastern Europe
Alternative analyses, energy policies, new perspectives.

By Felix Chr. Matthes and Lutz Mez 448p, 1996.
Contact: Heinrich-B”ll-Stiftung e.V.,
Br ckenstrasse 5-11, 50667 K”ln, Germany.
Ph/fax: +49-2212-0711-0/-51.

Energy and Environmental Challenges in Central Asia & Caucasus: Windows for co-operation
Overview of energy/environmental situation. Includes theme and country status papers.
By Preeti Soni, 264p, $ 56, 1996.
Contact: Outreach Cell, Tata Energy Research Institute,
Darbari Seth Block, Habitat Place, Lodhi Road,
New Delhi 110003, India.

It's a Breeze! A Guide to Choosing Windpower
By Hugh Piggott. 36p, œ4.50, 1995.
Off the Grid: Managing Independent Renewable Electricity Systems
By Paul Allen, B. Todd. 60p, œ5.50, 1995.
Power Plants: Biofuels Made Simple
By Brian Horne. 64p, œ5.50, 1996.
Contact: New Futures, The Centre for Alternative Technology
Publications, Machynlleth, Powys SY20 9AZ, UK.
Ph/fax: +44-1654-702400/-702782.
Email: cat@gn.apc.org.

Letters to Nani G. Oruga: An NGO Guide to the Global Environment Facility (GEF)
A series of letters from one fictional NGO to another, addressing the NGO-GEF relationship; what is the background, structure and operation of the GEF, and how can NGOs be involved. 69p, 1996.
Contact: Climate Network Europe, 44 rue du Taciturne,
1000 Brussels, Belgium.
Ph/fax: +32-2231-0180/-2230-5713.
Email: canron@gn.apc.org.

Periodical:
Pyne, Pyrolisis Network for Europe
New network of experts and enthusiasts from the EU Countries.Coordinators in all EU countries. First newsletter published March 1996. Free.
Contact: Karen Dowden or T. Bridgwater, Energy Research Group,
Aston University, Birmingham B4 7ET, UK.
Ph/fax: +44-121-359-3611/- 3596814,
email:k.dowden @aston.ac.uk.
http://www.ceac.aston.ac.uk/erg/PyNE.html.

Internet & CD ROM

New! Join It!
CD-ROM Library for Sustainable Development & <R>Basic Human Needs
The CD release on 1/10/96 will include 40,000 pages (200 Books.) $14. The goal is to publish 5-10 CD-ROM by July 1997.
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Contact: Michael Loots, Global Help Project, Ooterveldlaan 196,

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Ph/fax:+32-3-4480554/ -4497574.
email: mloots@innet.be.
http://www.globalprojects.org/humcdrom/welcome.htm.

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Join it by sending material on disk.
Contact: About CREST, Solstice see article in the previous issue of Sustainable Energy News.
email: gemkeeper@crest.org,
http://solstice.crest.org/sustainable/gem/

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Events
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* Event with INforSE participation

June 30, 1996*
INforSE - Europe Annual Meeting, Copenhagen, Denmark
Info: INforSE - Europe, see page no.11

July 1-8, 1996*
The City as an Organism, Urban Ecology Now & in the Future, Copenhagen, Denmark
European Conference & Exhibitions on sustainable & urban environ. 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 page no. 11

July 8-12, 1996
Moscow Solar Summit, Russia
Info: see Solar Summit NGO Newsletter

July 16-18, 1996
13th International Conference on Passive & Low Energy Architecture, Building and Urban Renewal, Louvain la Neuve, Belgium
Info: Prof. A. de Herde, Architecture et Climat, Place Levant, B-1348 Ottignes Ouvain la Neuve, Belgium.
Ph/Fax: +32 10472142/+35 10474544,
email: deherde@arch.ucl.ac.be.

July 19-29, 1996
2nd Annual Baltic Youth Environmental Camp, Kaliningrad, Russia.
Languages: English and Russian.
Info: Ecodefense, P.O.Box 1477. Kaliningrad, Russia.
Ph/fax: +7-0112-437386,
email: ecodefense@glas.apc.org.

July 24-27, 1996
High-Level Expert Meeting on Solar Energy, East & South Asia, Akita, Japan
Info: see Solar Summit NGO Newsletter

July 25-26, 1996
Workshop: Silt Damages at Hydro Power Stations, New Delhi, India
Info: Shri C.V.J. Varma, Central Board of Irrigation and Power Malcha Marg, Chanakyapuri, New Delhi-110021, India. Ph/fax: +91-11-301-5984/-6347, email: cbip@cbipdel.uunet.in.

July 29-31, 1996
First Trabzon Int. Energy & Env. Symposium, Trabzon, Turkey
Info: Prof Dr. T. Ayhan, TIEES-96, Dept. of Mech. Engineering, Karadeniz Tech. Univ., Trabzon 61080, Turkey.
Ph/fax: +462 325-3223/-7405,
email: energy96@risc01.bim.ktu.edu.tr.

July 29-31, 1996
Solar Energy in East and South-East Asia, Ogata-Mura Village, Japan
Info: UNESCO, SC/EST, 1, rue Miollis,
75732 Paris Cedex 15, France.
Fax: +33-1-40659535.

August 4-24, 1996
Ecotopia, Czech Republic
Environmental camp with workshops on sustainable energy and much others.
Info: EYFA, Postbus 94115, 1090 GC Amsterdam, Netherlands.
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, Berkley, CA 94704 USA.
Ph/fax: +1-510-54999-14/-84.

August 26-29, 1996
International Conference on Sustainable Use of Biological Resources, Budapest, Hungary
Info: Dr. Gusztv Hencsey, Computer and Automation Research Institute, MTA, Kende u. 13-17, H-1111 Budapest, Hungary.
Ph/fax: +361- 18-10511/-69378,
email: hencsey@sztaki.hu.

August 28-29, 1996
The 6th Asian Conference on Energy Technology, Bangkok, Thailand
Info: Prof. Chullapong Chullabodhi, KMITT, Bangmod, Ratburana, Bangkok 10140, Thailand. Fax: +662 479062.

August 28-29, 1996
Int. Energy & Environment Conf. Sydney, Australia
Info: Lori Evans, Business Council of Australia, POBox 7225, Melbourne 3004. Australia.
Ph/fax: +61-3-9274-7715/-9274-7744.

August 28-30, 1996
Renewable Energy for Rural Development, Bangkok, Thailand
Info: ASEAN Solar Energy Network, P.O. Box 91, Ratburana, Bangkok 10140, Thailand.
Fax: +662 4284014.

September 1-4, 1996*
Preparatory NGO Meeting to the UNESCO Conference on Adult Education, Sopron, Hungary
Info: See page no. 4. Included calendar to the official Preparatory Meetings also.

September 5-7, 1996
EWEA 95: Economics of Wind Energy, Helsinki, Finland
Info: Erkki Haaparem, Finnish Wind Power Organisation, Fin 35600 Halli, Finland.
Fax: 35842820648.

September 9-11, 1996
Int. Conference: Environ., Long -Term Governability & Democracy, Abbaye de Fontevraud, France.
Info: Monique Cavagnara, Centre de Prospective et de Veile Scientifique, Drast, Matet, Tour Pascal B, F92055 Paris La Defense, Cedex 04 France.
Fax: +33-1-40816396.

September 15-19, 1996
Bioenergy '96, Tennessee, USA
7th National Bioenergy Conf., & 3rd Liquid Fuel Conf., Nashville.
Info: Bonnie Badger, Southeastern Regional Biomass Energy Program, Tennessee Valley Authority, CEB 3A, PO Box 1010, Muscle Shoals, Alabama 35662-1010, USA.
Ph/fax: +1-205-386-2925/-2963.

September 16-17, 1996*
World Solar Summit, Harare, Zimbabwe
Info: see Solar Summit NGO Newsletter

September 16-19, 1996
EuroSun '96, 10th Int. Solar Forum, Freiburg Germany
Info: ISES-Europe or Deutsche Gesellschaft f r Sonneenergie, Augustenstr.79, 80333 M nchen, Germany,
Ph/fax:+49-8952-4071/-1668

September 22-25, 1996
Second European Biofuels Forum, Graz, Austria
Info: Joanneum Research, 2nd European Biofuels Forum, Elisabethstrasse 11, A-8010, Graz, Austria. Fax: +43-316876-320.

September 30 - October 1, 1996
First European Energy Crops Conference, Enschede, Netherlands
Info: see page no. 11

October 7-9, 1996
REAP '96 Conference & Exhibition
Info: see page no.8

October 7-11, 1996
International Course: Small Hydro Development, New Delhi, India
Info: International Association for Small Hydro, CBIP Building, Malcha Marg, Chanakyapuri, New Delhi 110021 India.
Ph/fax: +91-1130-15984/-16347.
Email: cbip@cbipdel.uunet.in.

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.

October 22-25, 1996
Energy Africa '96, Nairobi, Kenya
Info: Tracey Nolan, 37 Upper Duke Street, Liverpool L1 9DY, UK.
Fax: +44-151709 7801.

October 28-November 1, 1996
Velo Australis, Int. Bicycle Conference, Fremantle, Australia
Info: Promaco Conventions Pty Ltd. PO Box 8I90, Canning Bridge, Western Australia 6153.
Ph/fax: +61-9-3648311/-3161453,
email: promaco@cleo.murdoch.edu.au.

January 6-10, 1997
3rd Int. Conference on Solar Cookers Use and Technology, Tamil Nadu, India.
Info: Rajammal Devadas, Avinashilingam Deemed University, Coimbatore 641043, India.
Ph/fax: +91-422-440140/-438786.

January 8-10, 1997.
Passive and Low Energy Architecture, Kushiro, Japan
Info: Secretariat, PLEA 1997 Kushiro Conference. Ph/fax +81-33798-5122/-5130.

January 22-24, 1996
Energy and Economic Growth - Is Sustainable Growth Possible?, New Delhi, India
Info: Dr Leena Srivastava, Policy Analysis Division, Tata Energy Research Institute, Habitat Place, Lodhi Road, New Delhi 110 003 India. Ph/fax; +91-11-462 2246/1117

February 3-7, 1997
1st Int. Conf. on Renewable Energy - Small Hydro, Hyderabad, India
Info: C.V.J. Varma, CBIP Building, Malcha Marg, Chanakyapuri, New Delhi 110021, India.
Ph/Fax: +91-011-3015984/-30116347,
email: cbip@cbipdel.uunet.in.

February 4-7, 1997
R'97 - Recovery, Recycling, Re-integration, Geneva, Switzerland
3rd International Congress with Exhibition, language: English, French, German.

Info: EMPA, Dr Xaver Edelmann, Chairmann PO Box, CH-9001 St Gallen. Ph/fax: +41-71-300101/-300199.

August 24-29, 1997
ISES 1997: Future Globe in the Sun, Korea
Info: Korean Solar Energy Society, 635-4 Yeoksamdong, Kangnamgu, Seoul 135730, Korea. Fax: +82-2-5689208.

The next issue will include a new Worldwide Sustainable Energy Contact List, excluding the Contact List for Europe, which was published in the last issue.

<%-2>For any changes to addresses, ph, fax, email or contact person, please complete and return to us the form beside to make sure to have a correct entry in the Contact List.

If you have proposals for new contacts or you do not want to be at the Contact List any more, please also return the form.

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E-mail: INforSE@phil.gn.apc.org
att. Benjamin Gertes

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Fax: +91-11-5529646,
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Email: ove@inforse.dk
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Email: bedi@seps.ke.sanet.sk
att.Emil Bedi

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IED - Instituto de Ecologia e Desenvolvimento, rua da Assemblera 10, sala 816, Rio de Janeiro, CEP 20119-900, Brasil.
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att. Martin Prieto Beaulieu

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Email: eaf@igc.apc.org
att.: Margaret Hubbard
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