SUSTAINABLE ENERGY NEWS

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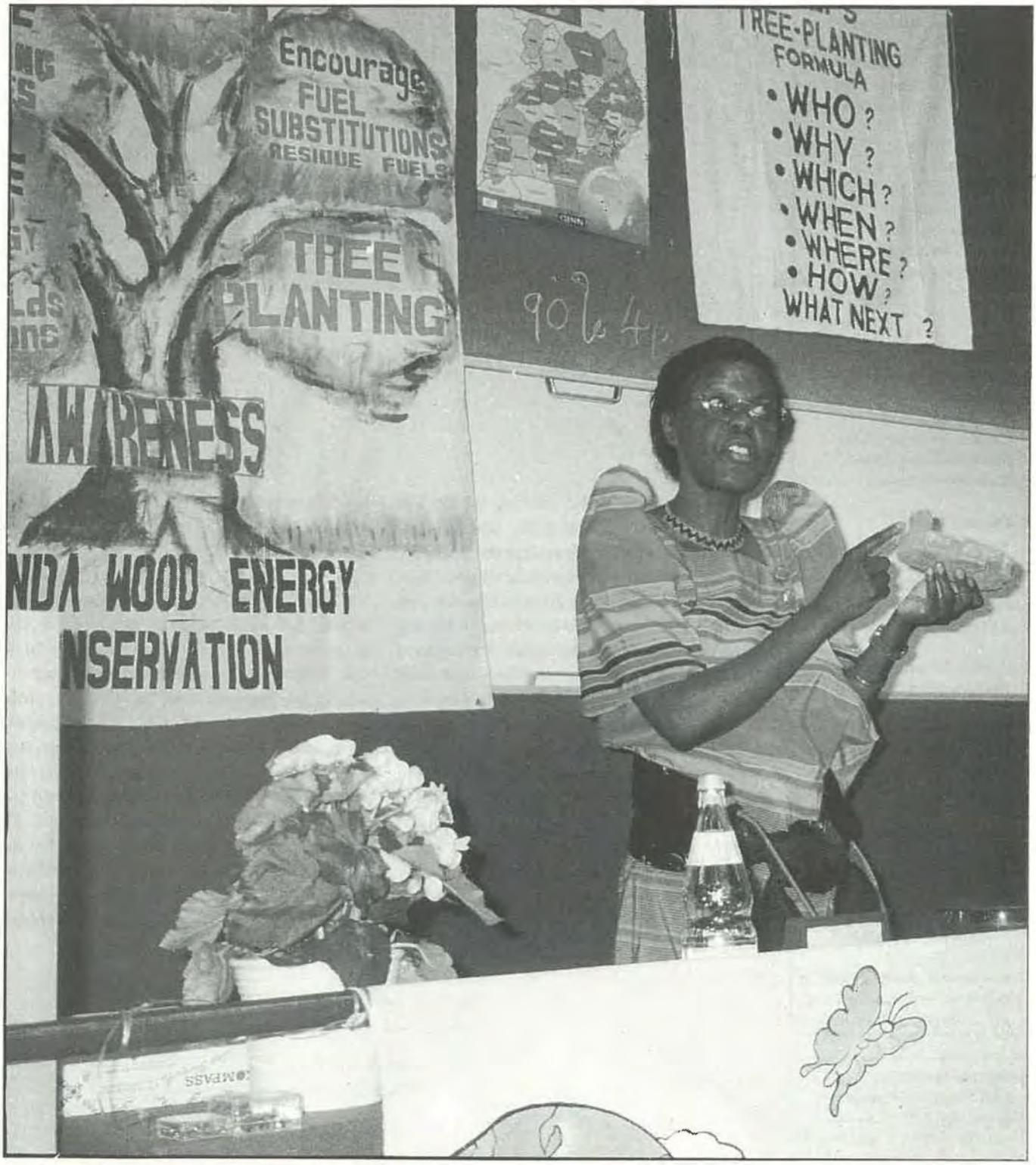

Sustainable Energy Worldwide Contact List (excl. Europe) Included

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Photo on front page:
Ruth Namusubo, Uganda
at the INFORSE Workshop
at CONFINTEA V (article p. 4).

Energy & Development After UNGASS:

An Agenda to Improve

"Leaves of Hope" from the NGO Global Forum at the Rio Conference'92.

The five-years-after-Rio meeting of the UN General Assembly, UNGASS, was a disappointing event for most participants. Basically the message was: no progress at all since Rio. Instead of falling back in distress, however, we need even more vigorous efforts in the coming years to reverse the unsustainable development pattern that still predominates five years after Rio. There are enough challenges to face.

The energy agenda in the years after Rio was closely linked to the climate issue, and in consequence, to the over consumption of fossil energy in industrialised countries. This is clearly an important, if not the most important, global energy problem. But it is not the only one. The fuelwood problem and the lack of modern energy services such as electricity are major energy problems for the half of the world's population living in rural areas of developing countries, and are thus also of global importance.

The *Program for the Further Implementation of Agenda 21*, adopted at UNGASS, has many weak points. There are reasons to question whether governments and companies are taking environment and development problems seriously, such as in the area of climate change. It is a step forward, nonetheless, that energy is now on the global agenda in its own right. The challenge now is to develop a proper agenda for energy and development. An agenda that takes into account the global inequalities in energy consumption as well as the problems of climate change, desertification, depletion of forests and trees, and the energy problems of the poor.

René Karottki
INFORSE Secretary

Rio Needs More Energy

By René Karottki, INFORSE

Even though energy is now on the agenda of the Rio-follow-up process, there is still a need to elaborate on the international agenda for energy and development. A quick review and comment on the status of energy in the continued Rio-follow-up is given below.

In late June of this year, a Special Session of the UN General Assembly (UNGASS) was held in New York to review the achievements since the Rio conference in 1992. The general feeling among most participants was disappointment, in particular on issues such as financing and forests. It was also hoped that the meeting would send a strong signal on reduction of man-made CO_2 emissions to the forthcoming climate meeting (COP 3) in Kyoto this December, but this did not happen. So, instead of documenting progress, UNGASS demonstrated the need for even more vigorous efforts in the coming years to reverse the unsustainable development pattern that is still predominant five years after Rio.

The final document from UNGASS mentions energy as an issue under other headings, as well as in a separate section.

Energy Across Sectors

The section on '*Changing consumption and production patterns*' discusses the possibilities for a fourfold improvement in materials and energy efficiency within the next 2-3 decades as well as a possible tenfold improvement in the longer term. It also calls, rather vaguely, for international cooperation in this field.

The section on '*Forests*' highlights forests as a major renewable energy source, especially in least developed countries, but fails to mention the mainly rural problems with access to fuelwood.

The section on '*Transport*' mentions the transport sector as one of the major forces behind the world's increasing need for energy. It states that the present pattern is unsustainable, and that this can increase health and environmental problems. The measures suggested to reverse this trend are '*economic instruments*'. A more specific proposal for a tax on aviation fuels, which was mentioned in the previous drafts, was omitted from the final version.

And, finally, the section on '*Atmosphere*' does not mention energy at all, even though consumption of fossil fuels in industrialised countries is the single most important source of man-made CO_2 emissions.

The Energy Section

There was no separate section on energy in Agenda 21 of the 1992 Rio Conference, and it can be seen as a step forward that this is now included in the UNGASS document.

The section on '*Energy*' states that fossil fuels will continue to dominate the energy supply for many years to come, and that it is necessary to reduce the environmental consequences of this development. There is no mentioning of reduction in the use of fossil energy sources as a pre-condition for sustainable development. The energy needs of developing countries for social and economic development are highlighted, especially for the billions of people living in rural areas who have no access to modern energy services.

The document recommends the establishment of an international group of experts in energy and development to prepare for the 2001 meeting of the Commission for Sustainable Development (CSD), where 'a sustainable energy future for all' will be on the agenda.

Increased support to developing countries and countries with economies in transition is suggested, focusing on renewable energy, energy conservation,

and less pollution from fossil energy. A special focus on environmentally sustainable electrification in third world rural areas is mentioned. The section also recommends that environmental costs gradually be internalised in energy prices and that subsidies for non-sustainable energy production and consumption be removed. Finally, it calls for better coordination of sustainable energy activities within the multilateral organisations.

Among the main drawbacks of the energy theme in the UNGASS document are:

- The over consumption of fossil energy in industrialised countries is not highlighted as the main global energy problem.
- The most important energy problem for rural and poor people in developing countries, the fuelwood problem, is mentioned only superficially.
- The only suggestion mentioned to solve energy problems in rural areas of developing countries is electrification.

It is likely that the UNGASS document will be the basis for the new CSD activity on energy and development. Given the drawbacks mentioned, there is thus a need for organisations and individuals with experience in this field to get involved, in order to develop the total picture of energy and development, which is still incomplete, as well as to include field and community experience into the process.

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💻 *UNGASS documents available on internet at gopher://gopher.un.org /70/11/ga/docs/S-19.*

Drawings are from UN Climate Change Information Kit, see publication list.

Environment Now on UNESCO's Agenda

From the INFORSE delegation. From left to right: Ruth Namusubo (Uganda), Svend Erik Ladefoged, Raúl Montenegro (FUNAM, Argentina), Angelle Fatou Sarr (ENDA, Senegal), Zareen Myles (WAFD, India), and Lucy Ann Ruzive (BUN, Zimbabwe)

By Svend Erik Ladefoged and René Karottki, INFORSE

UNESCO held its 5th world conference on adult education, CONFINTEA V, on July 14-18, in Hamburg, Germany.
INFORSE was invited by UNESCO to work on the theme of environment, in collaboration with International Council for Adult Education (ICAE).
INFORSE and ICAE organized workshops on environment and development, presented an exhibition at the Conference center, and issued a publication on environmental education from all over the world.
INFORSE and ICAE also suggested text to strengthen the emphasis on environment in the documents of the conference.

About 1,500 delegates from 160 countries met for 5 days to discuss the role of adult education in the 21st century. Ten themes were debated at the conference and its thematic workshops, ranging from democracy and peace to enhancing international cooperation and solidarity. A '*Declaration*' and '*Agenda for the Future*' was adopted by the delegates, and, partly because of the efforts of the 10-person INFORSE group, environment and development now have a position in the two documents.

INFORSE was able to bring in members from Zimbabwe, Uganda, Senegal, India, and Argentina. During the workshop and an exhibition, they highlighted environmental aspects of adult education involving small biogas plants, training in construction of clay stoves, use of the media for popular environmental education, etc.

In the '*Declaration*', environmental sustainability is now mentioned among the key issues for adult education in the next century, with the following words:
"*Education for environmental sustainability should be a lifelong learning process which recognizes that ecological problems exist within socio-economic, political, and cultural contexts. A sustainable future cannot be achieved without addressing the relationship between environmental problems and current development paradigms. Adult environmental education can play an important role in sensitizing and mobilizing communities and decision-makers towards sustained environmental action.*"

The '*Agenda for the Future*', the plan of action associated with the '*Declaration*', contains the following commitments on environment (section 35):
Promoting the competence and involvement of civil society in dealing with environmental and developmental problems:
1. By making use of adult-education activities in order to increase the capacity of citizens from different sectors of society to take innovative initiatives and to develop programs for ecologically and socially sustainable development.
2. By supporting and implementing adult-education programs to give people chances to learn and interact with decision makers on environmental and developmental issues, in particular on the need for changes in production and consumption patterns.
3. By integrating indigenous and traditional knowledge of the interaction between human beings and nature into adult learning programs, and by recognizing that minority and indigenous communities have special authority and competence in protecting their own environment.
4. By ensuring the accountability of decision makers in the context of environment-, population-, and development-related policies.
5. By integrating environmental and developmental issues into all sectors of adult education, and to strengthen adult learning components in environment and development programs.

✉ *The full texts of the official documents are available from the UNESCO Institute of Education (UIE) in Hamburg, Germany, ph: +49-49-448 041-0, fax: +49-40-410 772-3, e-mail: uie@unesco.org.*
💻 *http://unesco.unep.edu/confintea.*

Meeting at the INFORSE exhibition. From left to right: Kristof Kristiansen (Denmark), Edicio dela Torre (ELF, Phill.), Raúl Montenegro (Argentina)

Reflections on CONFINTEA

By Lucy Ann Ruzive, Biomass Users' Network, Zimbabwe

The conference was high-powered and endeavouring to create a more informed and involved civil society through formal and informal adult learning. The issue of sustainable energy was somehow neglected except in theme 6 of the conference (environment) and at the INFORSE stand.

Big Issue for Us!

For us who are working in the South, the environment and sustainable energy are very big issues that need to be addressed. Adult education in this area is of fundamental importance. Educational programs tailored towards promoting the sustainable use of biomass resources will be of great help to our rural communities, which are not connected to the national grid.

What I experienced at the INFORSE exhibition stand, if shared with the grassroots communities with whom we work, will produce good results. Wood-saving stoves and small family-size biogas plants are some of the lessons which need to be part of grassroots learning programs. Adult education in the area of sustainable energy will indirectly reduce environmental degradation in our rural areas, where gully formation is the order of the day due to over-cutting of trees.

Starting a New Era?

The inclusion of NGOs with government and donor agencies in the conference may be a blessing for NGOs like the Biomass Users' Network. This may be the start of a new era in which our programs will strongly emphasize the education of youth and of adults about sustainable energy. The participatory approach that we usually employ in our programs requires the financial and political support of donor agencies and government officials, respectively.

I hope to see implementation of the conference objective of making funding available from various sectors for adult education. I say this because programs to continue sensitising the community, especially women and decision-makers, on the need to conserve the environment need to be boosted. It is this education which, in most cases, is underrated and is usually ignored during budget allocation processes.

Lucy Ann Ruzive at CONFINTEA

The idea of respecting indigenous knowledge is a noble one. It also can provide a platform for environmental adult-education programs. The existing knowledge of indigenous people should be recognised, and educational programs must be seen as refining that knowledge. Such an approach usually brings about a sense of belonging within the community, which plays an important role in sustainable development. If people feel that they are part and parcel of the program, they will participate fully.

World Solar Program Launched

By Gunnar Boye Olesen, INFORSE

9 months after the World Solar Summit that was held in Harare, Zimbabwe in September'96, the World Solar Program (WSP 1996-2005) was launched in June '97 at a meeting of the World Solar Commission.

Project Framework

The World Solar Program (WSP) serves as a framework for projects and programs. Five of these are global:

- The Global Renewable Energy Education and Training Program. UNESCO is currently preparing the details of this program.
- International Renewable Energy Information and Communication System. It will be based on the World-wide Information System on Renewable Energy (WIRE) of the International Solar Energy Society (ISES), as well as on UNESCO's own experience.
- Strategy for Renewable Energy for Rural Electrification. This will be a strategy for promotion of research and development of electrification activities for people living in the world's remote rural areas. UNESCO and the UN Food and Agricultural Organisation (FAO) will collaborate on this.
- Renewable Energy for Water Desalination and Treatment.
- Industrial Policy, Market Penetration, and Technology Transfer for Renewable Energy. The UN Industrial Development Organization (UNIDO) will take the lead in this.

The regional initiatives include about 20 projects, from establishing training centres, information networks, and demonstration villages to special initiatives for rural electrification and biomass.

The national projects include 458 officially selected projects.

The World Solar Commission and its secretariat at UNESCO in Paris will continue their work with the WSP.

No New Funding Mechanism

The WSP did not manage to attract donors to establish a funding mechanism for the priority projects. To realize the projects, WSP projects have to compete with other proposals for the existing funding.

NGOs Hardly Involved

The process that led to the WSP has only involved NGOs to a limited extent. In general, openness to NGO participation has been several levels below other international processes, such as the Rio-Process and CONFINTEA V.

It is not clear from the WSP whether community based NGOs have been involved in the planning of the projects or whether they will have a part in the implementation. This is not promising for a successful WSP 1996-2005.

💻: The WSP is available from the Web-site: http://www.unesco.org/science/wssp.

India's Leading Windpower

A series of financial and legal incentives and the mapping of the wind potential resulted in a rapid annual 150-200 MW rise in the installed windpower capacity since 1992.

Towards 20,000 MW

Up to 20,000 MW of wind turbine capacity could be installed in India, making wind a substantial contributor to the national grid, according to the Ministry of Non-Conventional Energy Sources (MNES) of India. By the end of the century, the realisation of 2,000 MW can be foreseen.

At the end of 1996, the installed capacity was 820 MW, which is producing 1.5 billion kWh/year. This capacity is a result of a rapid annual rise of 150-200 MW from 1992 and a total investment of 30 billion Rupees (See figure and map). In 1996, the pace slowed down due to uncertainty of the result of electing a new government. Now, there is evidence that the Indian market is reviving and that the new government does not plan to change the support structure for wind power.

Wind Mapping

The starting point of the development was that the Indian government established a wind-monitoring and -mapping network in all 23 states, with about 530 mapping sites and 213 wind-monitoring stations.

Besides identifying the windiest regions, the MNES prepared a master plan including information about availability of the grid at these sites.

Attractive Investment

India has become attractive to private investors in wind energy by offering a series of legal and financial incentives. The historically centrally controlled electricity network has been opened up to private investors in each state.

The main incentives are:

- Depreciation of 100% on investment during the first year allowing the buyers to buy the turbine out of profit,
- 5-year tax-free period for income from sale of electricity,
- subsidies of capital investment,
- facility of banking,
- premium price paid for electricity,
- opportunity for sale of power to a third party.

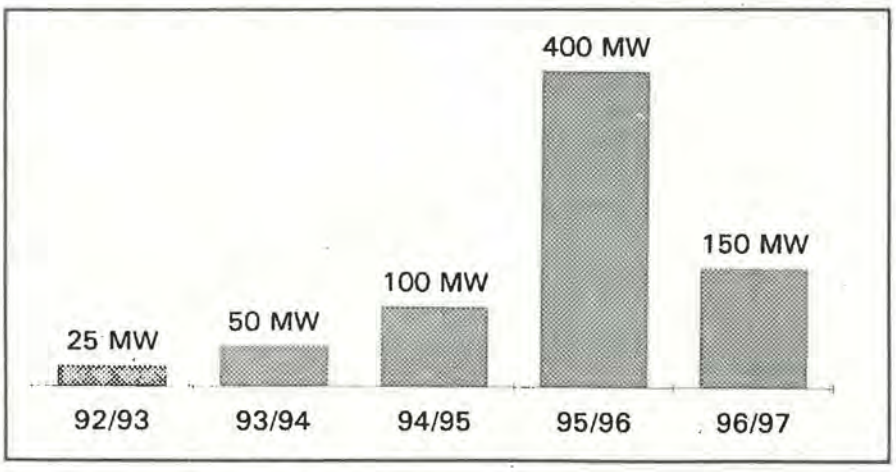
The purchase price of the electricity slightly varies in different states. In the windiest state, Tamil Nadu, for example, the "buy back" rate of 2.25 Rupees per kWh, set in 1995, will increase by 5% per year up to 2000.

Nearly all turbines are located in wind farms rather than singly. The largest concentration of the windmills is at Muppandal in Tamil Nadu, where roughly 1000 turbines are owned by over 100 different customers.

The Enthusiasm of Private Investors

The construction of the present capacity of 820 MW, installed since 1992, was mainly financed by private sources. The state-financed demonstration projects have only increased to 50 MW from the 1992 level of 32-MW.

The buyers are often local businesses in the areas in which the the development is located. Businesses often place their names in prominent positions on the turbine towers as a means of advertising.



Fast growth in India: Installed wind capacity 1992-96

25 Joint Factories to Manufacture Locally

More than 25 Indian companies established joint local factory production with Danish (6), German (6), Dutch, American (4), Austrian, Belgian, English, and Swedish manufacturers.

To accelerate the local manufacturing, the state introduced a number of incentives, like abolishing custom duty on major components such as blades, gearboxes, brakes, yaw components, and sensors. There is also exemption from excise duty and sale tax.

The manufacturing technology has been developing at a rapid rate. Though it started with wind mills in the range of 55-100 kW, presently the 200-250 kW are available and standardised. Even the 400-750 kW machines are available for commercial use.

The most popular windmills are either pitch or stall regulated and have 2 to 3 fibreglass-reinforced polyester blades.

World Bank and ADB Catching Up.

The credit process to be provided by big financial institutions is slower than the enthusiastic private investors. A World Bank loan of USD 78 million for 85 MW includes a grant from the Global Environmental Facility of US $30 million. The Asian Development Bank has scheduled a loan of USD 60 million.

30 units of 200 kW Micon wind-turbines, Muppandal, South India. Photo by NEG Micon, Denmark

225 kW Vestas wind-turbines in a wind farm, Gujarat, India. Photo by Vestas, Denmark

New Wind-Energy Center and Test Stations

To ensure the quality, test standards are established modified to the Indian conditions. The standards will be tested by new centers. MNES is establishing a wind-energy center at Chennai at Madras and a wind-turbine test facility at Kayathar in Tamil Nadu. The test center will be co-financed by UNDP (United Nations Development Program) and DANIDA (Danish International Development Agency). Another test station is planned in Gujarat by TERI (Tata Energy Research Institute) in collaboration with ECN (Dutch Energy Research Foundation). Beside standardisation, testing, and certification, the new centers will address resource assessment, research, and development.

The article was written by the editors based on the following sources:

Article "Country Survey: India" by Rakesh Bakshi, VESTAS RRB India, and by Crispin Aubrey, EWEA.
Wind Directions, April 1997. Published by European Wind Energy Association, 26 Spring str., London W2 IJA, UK.
ph:+44-171-4027122,fax:+44-171-4027125
e-mail: 101715.1101@compuserve.com

Article "Wind power development in India" by B S K Naidu, Indian Renewable Energy Development Agency, New Delhi, India. Published in "Rural and Renewable Energy: Perspectives from Developing Countries," edited by V. Ramana, 1997. Published by TERI, Tata Energy Research Institute, India. (see publication list on page no.18).

Renewable Energy Technologies in Africa

New publication by AFREPREN/FWD, INFORSE Regional Coordinator, Kenya

The new publication *'Renewable Energy Technologies in Africa'* outlines the findings of a study conducted by the AFREPREN/FWD and Stockholm Environment Institute. The book reviews the prospects of bio-energy, solar, small-hydro power, and wind energy technologies for water pumping in eastern and southern Africa region. It examines their current status, discussing the barriers that limit their wide-scale use, then draws conclusions for ongoing and future efforts to engineer large-scale dissemination.

The results indicate that the factors limiting the successes of renewable energy technologies (RETs) dissemination projects include poor institutional frameworks, pricing distortions, and high initial investment costs, coupled with absence of supporting financial instruments.

In spite of the above barriers, the prospects for RET development in Africa are promising. There is a growing number of instances in which dissemination of substantial numbers of RETs has been recorded.

More Information: See publication list on page no. 18 or see contact address at AFREPREN/FWD on this page.

New Projects in E. & S. Africa

By Stephen Karekezi, Timothy Ranja FWD/AFREPREN, INFORSE regional coordinator, Nairobi, Kenya

Six new projects on sustainable energy are about to start in Africa

As part of the Stockholm Environmental Institute's (SEI's) Energy, Environment and Development Program, six sustainable-energy projects are starting in East and Southern Africa. The projects are:

- *Regional Program of Renewable Energy Technology's (RETs) Applied Research in Eastern and Southern Africa* by AFREPREN. The research program will involve close interaction with major existing and potential actors.
- *RETs Training Programme* by AFREPREN. The project will be parallel to the research program. It will develop a detailed, tailor-made training multi-media package suitable for use in courses and/ or as a module of established university and polytechnics curricula. The target group includes university lecturers, development workers, and training managers in the region's renewables industry.
- *New Approaches to Organization and Management of Rural Power Supply* by TANESCO, Tanzania. The project is to help establish and follow up electrification cooperatives as one possible way to organize locally managed electricity distribution in Tanzania.
- *Methods of Exploring Bio-energy Options*. The project is to develop and test multi disciplinary methods for identifying bio-energy options suitable for rural households and the small-scale industry sector, enabling them to pursue environmentally sustainable economic development. The University of Dar es Salaam and Ministry of Energy are working on the project.
- *Charcoal management and Electrification of Low-Income Areas in Zambia.*
- *Sawmills as Energy Producers in Developing Countries.* The project is to produce a manual on how to utilize sawmill and forestry residue for generation of electricity or steam.

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💻 *http://www.sei.se/*

The Solar Boom in Kenya

By Mark Hankins, Energy Alternatives Africa Ltd (EAA), Nairobi, Kenya

The household solar electric market in Kenya is thriving and small is indeed beautiful for photovoltaic (PV) technology in Africa.

Even in the absence of financing, project interventions, or subsidies for PV, the Kenyan PV-market has grown rapidly, and it has potential for much more growth. In Kenya, rural households are very much aware of PV technology, and they want it. Although systems are often under-designed, people seem to be able to adapt to the low output. They are much happier with electric lights and PV-powered radio or TV than previous alternatives (i.e., kerosene, dry cells, and centrally-recharged lead acid batteries). There is a huge market potential for smaller systems and for solar lanterns.

These are some of the results of recent field research by Energy Alternatives Africa Ltd (EAA) that carried out 3 projects investigating the status of the Kenya PV market in 1996-97. The projects are described below.

The first study was made with the Kenya Rural Enterprise Program and Resource Analysis (Holland) and was supported by the Dutch government. The last two study were carried out by EAA for the World Bank Energy Sector Management Assistance Program (ESMAP). ⇨ p.9

Maasai woman from Olkonerei Integrated Pastoralists Survival Program with solar lantern/radio unit. Photo by: EAA.

Demand/Supply Study: Large Market Potential

An in-depth study of the local PV market analyzed existing energy expenditures of 1000 households and categorized PV demand based on household demand for lighting and on the ability to pay for PV systems. The results indicate that well over 1% of Kenya's rural households already have solar home systems (SHSs), and that over 70% of rural households are familiar with solar electricity (more households have SHSs than have connections under the rural electrification program). When shown prices of viable PV lighting systems, 73% of households polled said they would buy such a system. Based on household income, existing energy expenditures, grid power expectations, and stated desire for a PV system, the survey estimated a firm market potential of over 14 MWp for PV in Kenya. Market penetration may already exceed 10%. Most of those who stated an interest preferred systems of 20 watts or less, typically for one or two lights and a radio/cassette player. Households indicated that their priority of electric appliances are: lights (1), radio (2), and TV (3).

Study of Existing Systems: 40% Need Improvements

A random sample of 400 existing PV systems in 8 districts were analyzed to find out how they were performing and to determine whether customers were satisfied. Based on this was drawn a representative picture of the more than 50,000 systems installed throughout Kenya between 1984 and 1997. On average, purchasers spent less than US$ 400 per system, and the average module size is about 25 Wp. About half of the systems use amorphous modules. Systems tended to be bought with cash (93%). They were installed by local technicians (~50%), owner-installed (~35%), or installed by a local (PV) company (~15%). 60 % of the respondents were satisfied with their systems. Those, who were not satisfied, they complained of dead batteries (19%), limited power (13%), and poor performance of appliances (8%).

Although the 38% "dissatisfied" group is disturbing, it is not surprising. Consumers and technicians tend to under-design systems and use poor quality locally made lamps. 90% of the systems did not have charge regulators and over

50% of the lamps were inefficient incandescents. The survey showed that people often purchase a smaller module (i.e. 12 Wp) because they cannot raise enough cash to buy larger ones. People do learn to tailor their energy use to solar availability, though: 80% reduce power use during cloudy weather. 94% of the respondents would recommend solar electricity to a friend.

Market-test of Solar Lanterns: Good Design Can Sell

In this project EAA carried out a market test of 8 existing solar lantern products. The lanterns were sold through existing solar outlets in Kenyan towns at prices which would be possible if no duties or VAT were levied and sales were high. Afterwards customers and dealers were surveyed to get their views on the lanterns.

The project revealed that, if prices of solar lanterns were more reasonable (i.e. if no duties were levied on them and if there were mass marketing campaigns), rural people would buy them in large numbers. Of the 7 lanterns offered, one brand (similar in shape to the hurricane lantern) was clearly preferred by customers, and 50 units sold out almost immediately. However, the study found room for improvement in lanterns, as most are designed for "weekend camping" applications, not for the rigorous daily use of African households. Customers who were visited 6 months after their lantern purchases were generally happy with the units, citing the brighter light and lower kerosene expenditures. Nevertheless, once they had a little light, customers wanted even more light output and longer duration than the 3 hours that most units were able to provide.

Conclusion: Need for Smaller Systems, Training, Finance, Less Tax

The above studies demonstrate that solar electricity has established a strong foothold among rural Africans, and that the private sector should be given most of the credit for solar promotion in Kenya. Equipment suppliers who want to enter the rural market should bear in mind that there is a great need for better, smaller modular systems. However, the rural market will grow even faster if appropriate training, awareness-raising, and promotion activities are supported. Financing could help many households and institutions to afford the technology. Furthermore, in recognition of the role that PV plays in development, governments should remove duties on PV equipment and lights, as duty and VATs represent significant costs for rural consumers (Kerosene is subsidized in Kenya while import duty for PV-modules is up to 15% and VAT is 20%).

✉ *More information: Energy Alternatives Africa, PO Box 76406, Nairobi, Kenya ph:+254-2-714623 fax: +254-2-565616 e-mail: ydf@iconnect.co.ke.*

Photo on this page: Training of PV Installation. Photo by EAA.

INFORSE Workshop Argentina

October 29-31, 1997, Buenos Aires. Clean & Renewable Energy: Basis for Sustainable Development in Argentina.

By Marcelo Alvarez, REJIMA, Argentina

The first INFORSE activity in Argentina will be a workshop with focus on the electricity sector to develop strategies for renewable energy and to form a permanent forum for their implementation.

The primary aims of the workshop are:

- Developing strategies to support adoption of clean and renewable energy with due regard for sustainability.
- Integrate new knowledge of renewable energy in decision-making processes and in the strategies of involved agents.
- Promote education and information for citizens about sustainable energy to increase the active interest in the issue.

With the electricity sector as focus of the workshop, an assessment of the energy system for the workshop will address the following:

- Impact of electricity-market deregulation.
- Fiscal policies and subsidies from various sources.
- Financing renewables.
- Impact upon competitiveness and jobs.
- Greenhouse-gas emissions and mitigation options.
- Life-cycle analysis of different electricity supply and demand-side management options.
- Regulatory frameworks, energy planning, and financing in other countries / regions.
- Governmental and non-governmental initiatives.

The final document is expected to list goals and substance of actions to link the state with the civil society. This final report will summarize several relevant experiences, provide a local assessment of problems for development of renewable energy, and propose different scenarios with corresponding expected impacts upon society and environment. Proposals and recommendations will take institutional aspects into account. Clearinghouse mechanisms as well as information collection and -diffusion methods will be proposed. Further, quantified goals for specific years will be incorporated.

The final report will also include an agenda for NGOs and official institutions. A permanent forum with representatives from business, government, and NGOs will be established to follow up on this agenda.

Support for the meeting has been obtained from the Dutch Embassy in Argentina and from the Argentinean Secretary of Energy.

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Photo above: 2,880 Wp Stand alone PV system for telecommunication, Jujuy, North West Argentina

Photo below: 8 units of Micon's 750 kW wind turbines shipped from Denmark to Comodoro Rivadavia in June 1997. It will be the biggest wind farm in Argentina. Photo by: NEG Micon

USA News

800,000 Climate-change Jobs

A new study, *"Energy Innovations: A Prosperous Path to a Clean Environment"*, concludes that it is possible to reduce US CO_2 emissions by 10% during the period of 1990-2010 while reducing energy costs by $530 per family and creating almost 800,000 additional jobs. This can be achieved through policies that stimulate the introduction and use of better technologies to use energy more efficiently and to tap renewable-energy resources.

✉ *The study is published by the American Council for an Energy-Efficient Economy, the Union of Concerned Scientists, the National Resources Defence Council, and others (see contact list for addresses).*

Increased US Budget for Sustainable Energy

In the US federal budget for Financial Year '98, the renewable energy budget increases by about 5% over the '97 budget (7% minus inflation) to about $230 million. While the final budget is not ready, the proposals of the Senate and of the House of Representatives are very close, $234 million and $228 million, respectively. The largest share of this budget is for PV (28%), while other large allocations are for biomass (26% equally split between biomass for transportation and biomass for power generation), wind (14%), geothermal (13%), and solar thermal (7%).

Source: Sustainable Energy Coalition Update, July'97.

US Congress Renewable Energy Group

In the US House of Representatives, an increasing number of members are joining the "House Renewable Energy Caucus". Now, 116 members participate in the Caucus (58 Republicans, 57 Democrats, 1 Independent), or 27% of the 435 members of the House. The members of the Caucus have supported increased federal funding for renewable energy.

Source: Sustainable Energy Coalition Update, June '97.

Solar Homes Tour

At the 5th annual National Tour of Solar Homes, which will take place on October 18, more than 400 solar-powered homes in 36 US states will open their doors to the public and show how they utilize the sun in their daily lives.

See website http://www.ases.org/solar/ or call the American Solar Energy Society, ph:+1-303-443 3130.

New Coalition for Distributed Power

Several US advocates for distributed power have formed the Distributed Power Coalition of America (DPCA). The new coalition will promote the development of distributed power and the use of multiple fuels in distributed power plants. It will focus on small power plants that use solar, wind, water, and natural gas. It wants to remove regulatory and legislative barriers to distributed power as well as lax air-emission standards that favor coal-fired power plants.

✉ *Information: DPCA, att. Skip Horvath, ph: +1-202-626 3225.*

Two More Nukes Close

The owners of the Maine Yankee reactor (in Maine) and those of the smaller Big Rock Point reactor in Charlevoix, Michigan have both announced that the reactors will close permanently. Both reactors are closing because of high costs that will make them unprofitable in a competitive market.

Source: Sustainable Energy Coalition Update, June '97.

Innovative Experiences in Environmental Education in Argentina

Using its resources as an environmental organization, FUNAM (Foundation for Environmental Defence) has developed a number of teaching tools to increase the awareness of environmental problems and sustainable solutions.

The Telar electronic network provides FUNAM (Foundation for Environmental Defence) the means to reach more than 700 secondary and adult schools. For the schools in this network, FUNAM offers "windows" (themes) including:

- Energy saving and soft technologies,
- Citizens' successful campaigns,
- Use of citizens' rights, and
- Grassroots questionnaires.

Especially for teachers of adult education, FUNAM organizes Eco-Workshops in cooperation with the teachers' trade union. More than 600 teachers have participated in such workshops.

For children, FUNAM has chaired two campaigns, the *"Campaign for peace and life"* and *"Voice of the children international campaign"*, involving more than 350,000 children in Argentina. Both campaigns included public hearings with children and adults, and "Children's Appeals".

A new project is the development of 12 videos for education and television. Among the titles of the videos are *"Sustainable energy sources and soft technologies"* and *"Signs of Hope: Successful stories from around the World"*.

Maybe the most important educational outreach by FUNAM is via its campaigns in which it links activism with education. Each campaign includes educational messages and technical explanations. The campaign targets have included stopping deforestation of dry forest, stopping atomic power plant construction, and currently a campaign against construction of the "Parana Medio", a large dam that would have widespread adverse environmental effects.

✉ *Information: FUNAM, att. Roul Montenegro, Casillo de Correo 83, Correo Central, 5000 Cordoba, Argentina, ph:+54-51-690282, fax: +54-51-520260.*

INFORSE - Europe Meeting, New Action Plan

On June 22, the 6th INFORSE-Europe meeting took place in Budmerice, Slovakia with 23 participants representing 14 INFORSE organizations.

At the meeting, the two INFORSE-Europe Coordinators were re-elected: Emil Bedi of Slovakia and Gunnar Boye Olesen of Denmark. The meeting decided upon an action plan for INFORSE-Europe 97-98, including:

- A database of case-studies /success-stories on sustainable energy shall be compiled for Central and Eastern Europe (CEE) (see Sustainable-Energy Succ., below).
- The database of renewable-energy manufacturers and services in CEE countries shall be disseminated further (available from FAE, Slovakia).
- The INFORSE-Europe e-mail list shall continue (send an e-mail to ove@inforse.dk to be included).
- Lobby the EU and cooperate with the EU Parliament's new Renewable Energy Inter-Group.
- Cooperate with "BankWatch Network CEE" to monitor Western energy investments in CEE.
- Energy-related activities of the Pan-European Environment for Europe process shall be monitored in cooperation with the NGO-Coalition in this field. In particular, the development of a European Energy Conservation Strategy shall be followed.
- The energy theme of the Baltic Sea Region Agenda 21 plan shall be persued.
- Pan-European implementation of UNESCO World Solar Program shall be monitored; participate in the related Pan-European Solar Conference, Sofia, September 1998.
- Follow the work of the new UN-ECE Sustainable Energy Committee, ask for a position as observer.
- Collaboration with other INFORSE regions on world issues.

Participants of the NGO Seminar, Budmerice, Slovakia, June 22-26, '97

The INFORSE-Europe Meeting was held at the start of the European Sustainable Energy NGO Seminar. The next Meeting is planned to be just after the Pan-European Environmental Ministers' meeting, Århus, Denmark, on June 26, '98.

Further information:
✉ *INFORSE-Europe, Gl. Kirkevej 56, 8530 Hjortshøj, Denmark. ph+45-86227000, fax +45-86227096, e-mail: ove@inforse.dk*
✉ *Foundation for Alternative Energy (FAE), P.O. Box 35, 85007 Bratislava., Slovakia, ph/fax: +421-7-836964 e-mail: ebedi@changenet.sk.*

European Energy Conservation Strategy

The *European Energy Conservation Strategy* is now being developed, based on decisions of the Environmental Committee of the UN Economic Commission for Europe. The Strategy shall be ready for the Pan-European Environmental Ministers' meeting, June '98 (Århus'98), and will include:

- presentation of "best practices" in energy conservation in CEE;
- energy-efficiency indicators and country reports on the state of energy conservation in all European countries;
- guidelines for national strategies of energy conservation, as well as for international cooperation in the field.

The Strategy is being developed by a Task Force drawn from the International Energy Agency (IEA), the European Energy Charter Secretariat, and the Danish Energy Agency; a Working Group of countries (Russia, Denmark, Norway, Switzerland); and a group of country experts (all countries). The groups will meet according to the following schedule:

- Oct. 30: Working Group Meeting
- Nov.18-19: Meeting of country experts
- Feb., 19: Working Group Meeting
- March 2-3: Final Meeting of country experts

The meetings are open to NGOs. INFORSE-Europe and the NGO Coalition "Environment for Europe" will coordinate NGO inputs. The NGO Coalition has established an open NGO Working Group to follow the Strategy and other energy-issues for Århus'98. NGOs are welcome to join the Working Group. At the European Sustainable Energy Seminar, June 22-26 a statement of NGO visions was submitted to the Task Force.
✉ *Information:INFORSE-Europe*

Huge Wind Potential on Kola

The largest potential for windturbines in Europe is probably on the Northern coast of the Kola Peninsula. This is the conclusion of a study made by the Kola Ecological Center and the Norwegian Society for Nature Conservation. Based on the high average wind-speed of 8-9 m/s (10 m above ground), and other favorable conditions, the study estimates that wind electricity can be produced at prices of about 115 Rubles/kWh (2.0 US-cent / kWh), and that a wind park could be an economically viable replacement of the Kola nuclear power plant.
More information:
✉ *Kola Ecological Center, Box 68, Apatity, 184200, Murmansk Region, Russia, e-mail: dmitriev@ksc-ien.murmansk.su*
✉ *Norwegian Society for Nature Conservation, att. Dag Høystad, e-mail: mirnnv@online.no.*
See publication list on page no.18

Sustainable Energy Successes in Central and Eastern Europe

In parallel to the development of the official list of "best practices" in energy conservation, INFORSE-Europe is developing a database of sustainable energy examples in Central and Eastern Europe. From this we will draw a list of successes or "good practices" that will be presented in parallel with the official list. Examples are already under preparation for Poland, Slovakia, Ukraine and Russia. If you are aware of good examples that you would like to have included, please contact INFORSE-Europe. (see p. 12)

Solar Energy to Crete

The Campaign for a fossil-fuel free Crete got a major victory in June when it was decided to construct a 50 MW PV-plant, which will be the largest PV-plant in the world. The size of the plant allows the lowest price so far for PV-installations, only 2.4 US$ / Wp (Watt peak) or about 25% of the normal costs for PV installations today. The price of electricity from the PV-station is 8.5 US cents/kWh, or 4% higher than the average price of electricity from fossil-fuel stations on Crete, without calculating environmental costs. The campaign is sponsored by Greenpeace, while the PV-plant is supported by EU and the Greek government.
Source: Greenpeace.

EU Strengthens Climate Policy

Besides the previously agreed-upon goal of 15% reduction by 2010 of major greenhouse gases (CO_2, methane, N_2O), the EU Environmental Ministers agreed upon a goal of 7.5% reduction by 2005 of emissions of these gases at their meeting, June 19-20 (goals for EU, under the assumption that common reduction goals for industrialized countries are set at the Climate Negotiations). The ministers agreed upon a list of common measures that could contribute to reaching the goals. These measures include: energy efficiency standards, reduction of subsidies for fossil fuels, and reduction of tax schemes as well as regulations that counteract energy efficiency. Before the meeting of the ministers, the EU Parliament had proposed stronger common measures, including an EU-wide energy consumption tax and a common method to include external (environmental) costs in the energy price. In another resolution, the Parliament called for at least 15% renewable energy (of conventional primary energy consumption) by 2010.
Source: EC Inform Energy.

Time to Act for IRP in EU

During the fall, probably in October, the EU Energy Ministers will discuss the amended proposal for a EU directive for Integrated Resource Planning (IRP) for the gas and electricity sector. The first proposal for an EU-directive for IRP was supported by the environmental NGOs and by the EU Parliament, but strongly opposed by the EU association of electricity companies, EURELECTRIC. Only 3 countries supported the proposal. The new proposal includes most of the amendments from the EU Parliament, mainly clarifications and more specific requirements for IRP. If the directive should go through the council of ministers this time, it is important that the NGOs who are in favour of the directive persuade their national governments to support it.

Source: INFORSE-Europe and EC Inform-Energy.

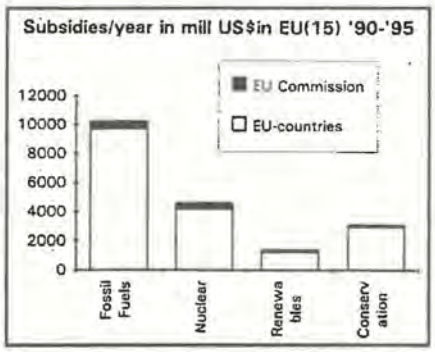
Gas Directive?

As holder of the EU presidency for the second half of 1997, Luxembourg decided to put highest priority on reaching a common position on the Gas Directive. Such a directive would open the EU gas networks to competition, allowing independent suppliers to use existing networks. A number of issues still need to be resolved before the countries can agree upon a common position, including requirements of separate accounts for production activities, and the status of gas storage in an open market.

Source: EC-Inform Energy, July '97.

Subsidies for Fossil Fuels Still High

Greenpeace has released a report "Energy Subsidies in Western Europe", quantifying subsidies for fossil fuels, nuclear energy, renewables and energy conservation. The report shows that the EU member states give 11 times as much for fossil fuels and nuclear than for renewables, while this ratio for the EU Commission funds is 7:1. It is very difficult to quantify subsidies, and some of the findings of this report can be criticized. This does not change the overall picture: nuclear energy and fossil fuels receive by far the largest share of energy subsidies, and only a smaller part goes to the sustainable energy solutions for which all countries have declared their support.
✉ *Information:Greenpeace International Climate Campaign, Keizersgracht 176, 1016 DW Amsterdam, Netherlands, ph:+31-20-523 6222, fax: +31-20-523 6200, http://www.greenpeace.org.*



New Nukes to Replace Chernobyl?

As part of the international agreement to close Chernobyl in 2000 is a proposal to finish two half-built VVER 1000 reactors in Ukraine: Khmelnitsky 2 and Rovno 4. The investment for this should come from the European Bank for Reconstruction and Development (EBRD) and from the EU. The plan has been widely criticized by NGOs and others because of lack of safety measures, and because the reactors are not the least-cost option. Because of the critics, a new environmental impact analysis is to be carried out from Sept. '97 to March'98. NGOs that want to participate in this process should contact:
✉ *Mr. Norbert Jousten, European Comm., DG IA, Rue de la Loi 200, Brussels 1049 Belgium, fax: 32-2-296 39 18, or*
✉ *BankWatch Network Energy Coordinator Petr Hlobil, Chlumova 17, Praha 3, 13000 Czech Republic, ph/fax:+420-2-227 80052, e-mail: petr.hlobil@ecn.cz.*

Biogas: Successful Indian NGO Experiences

97,000 biogas plants were installed by the AFPRO-CHP Network of 100 NGOs during a 13-year program that finished in 1997.

The NGO network, Action for Food Production-Canadian Hunger Foundation (AFPRO-CHF), has done a unique experiment in involving the non-governmental/voluntary sector in the dissemination of biogas technology. The program could be replicated in other areas, and the resultant feedback would assist in both planning and policy issues related to rural energy programs. It is the largest NGO-based program of the Indian biogas programs. In total 2.5 million biogas plants were installed during the last 16 years in India.

The Tata Energy Research Institute's (TERI's) in-depth study, conducted for 6 months in 1996/97, involved inspections of 482 biogas plants by 12 NGOs from 8 states. The study analyses the findings and worked out recommendations for the future as well. The findings of the study are described below:

Achievements:

- The network installed over 97,000 biogas plants in 14 states of India over a decade. The plants produce approximately 72 million m^3 biogas per year, serving 100,000 families.
- Nearly 5 million person-days of direct employment and an equal amount of indirect employment were generated. About 500 employees and 6,000 masons have been regularly engaged under the program.
- The reduction in fuelwood consumption has been between 25-40% of previous usage levels, resulting in a savings of about 300,000 tonnes/year of firewood and in the recycling of 18mill.t/year of cow dung, leading to cleaner village environments.
- The use of biogas also reduces pollution caused by burning dung in traditional chulhas in the kitchen.
- Women benefited from reduction of the time spent in fuelwood collection and cooking. An average family spends 31 trips x 5 hours per year instead of 40 trips x 9 hours on fuel collection, and nearly 1 hour of cooking time per day is saved by using biogas.
- Farmers obtained benefits from the use of biogas slurry as organic manure to replace chemical fertilisers, thereby leading to monetary savings.

81 % of the Biogas Plants Functions

- 81% of the biogas plants were found to be in use. Reasons for disfunctionality were non-technical, like the fluctuation of cattle holding, which affects dung availability. Very few plants had defects in construction.
- 80 % of the functional plants had smaller defects in accessories. 30% of the functional plants had defective stove parts, 23 % had jammed or leaking gate valves, and 12% had pipelines problems. Further, 70% of the inspected plants had either defective water-removing mechanism or non at all.

Creation of a Network

- The program resulted in the formation of a network of over 100 grassroots -level NGOs engaged in transfer of technology to the rural areas. The network has the capacity to construct 15,000 biogas plants every year.
- Regional consultative groups and an annual biogas seminar provide a good forum to discuss and develop the program.
- More than 1000 training courses have been organised. Promotional materials like slides, video, books, and manuals have been developed.

Financial Incentives

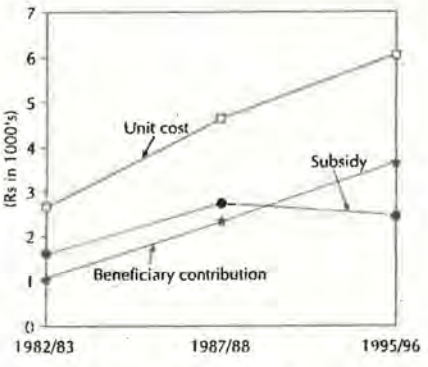
A package of financial governmental incentives has been developed for the rural people. There are subsidy for the beneficiary, turnkey fee for the biogas entrepreneur or NGO to cover a 3-year warranty period, and motivation fee for the motivator. The subsidy for the owner and the turnkey fee comes from the Indian Ministry of Non-Conventional Energy Sources, in some states with additional funding from the state government. The subsidy has preference towards people from lower classes (castes) of the society and small farmers. There is compensation of transportation cost in hilly areas.

During the last years the subsidy was reduced. Presently the subsidy for the owner covers around 30% of the cost of the plant. (see figure). It is feared that removing the subsidy may shift the beneficiary profile from the poorer to the richer part of the society. The subsidy is also justified because of the substantial environmental and health benefits.

Problems were identified in the present system of subsidies and turnkey fees, especially with delay in payments which for some NGOs considerably reduced the number of installed biogas plants.

AFPRO-CHF also provided additional funding for the involved NGOs, for training and technical assistance.

More information:
Articles in SEN no. 10, 14, 15.
The study is available from TERI, see publication list on page 18.



Cost of biogas plants in Bihar, India

Solar Heated Water Pays for Itself in Russia

By Eduard Gismatullin, Russia

Russian solar collectors are increasingly used, and can pay back in just 3 years, as this example shows from the Hospital in Krasnodar east of the Black Sea.

100,000 m^2 Solar Collector, 10 Russian Producers

Roughly 10 companies in Russia are involved in production of solar collectors that are used to produce heat. The total area of all solar collectors in 1994 was estimated by the Ministry of Fuel and Energy at 100,000 m^2. In most cases, these installations work in the south of the country and only during the warm seasons of the year. Beside the commercial solar collectors, it is a common practice in the countryside of Russia to use showers that use water heated by the sun. Even the use of these primitive devices throughout the country eliminates the need to burn millions of tons of coal, oil, and gas to heat water.

Hot Water for Cooking by 108 Solar Panels, 4 More Systems Planned

In the city of Krasnodar, about 1,200 km south of Moscow and 100 km north-east of the Black Sea, the regional hospital invested in solar collectors to lower the hospital's costs of heating and hot water.

The solar collector system was bought from a local company, UREK in 1995 at a price of 90 million rubles, about 16,400 USD. The system is supposed to pay for itself in 3 years, with savings on the city-supplied heating and hot water. In 1996, the system saved the hospital about 35 mill. rubles (6,400 USD).

The solar collector system produces 10 m^3 of hot water daily. The operational season is from the end of April until the end of September. The hot water in the pipe after it is heated by the collectors can reach 80°C in hot weather. The collectors are installed on the roof of a hospital's kitchen, and the water is used for cooking after some additional boiling powered by electricity. According to the manager of the hospital, the brass pipes used in the system are safer than the iron pipes usually used in water supply systems, as there is less reaction of the water with the metal. The system consists of 108 solar collector panels with a total area of about 88 m^2. A storage tank is used with these collectors to accumulate water and stabilize the supply. The drop in water temperature in the tank overnight is about 2°C. A pump is used to circulate water through the system.

The lifetime of the solar collectors is about 10 years. Collector panels have an average area of 0.81 m^2 and range in price from 80 to 210 USD, depending on the materials used in production. Possible materials include stainless steel or aluminium, brass or plastic pipes and a range of types of solar-collector surfaces.

The hospital is very satisfied with the solar collector system, and is planning to buy 4 more systems in the future. The hospital's total hot-water consumption ranges from 300 to 500 m^3 per day. The hot water serves 1,200 patients, 3,100 staff members, and 1,500 visitors of the clinic.

200 MW potential in Krasnodar

According to the UREK company estimates, in the Krasnodar region there is a potential to save 200 MW power for water production by these solar collectors as an alternative to the present electric heating. The company has installed 35 facilities on houses and commercial buildings, with a total collector area of 3,000 m^2 since 1993.

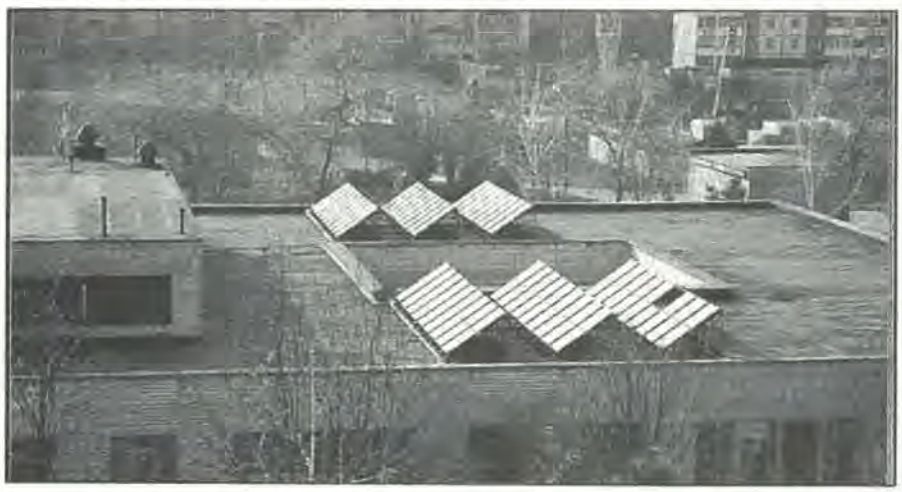
The production is in cooperation with the Kovrov Mechanical Plant. The UREK company has proposed changes in the solar panels' design to make them effective in all seasons of the year, with a projected 40% increase in annual output.

For more information:

✉ *Eduard Gismatullin, Vorontsovo Pole str., 16, building 4, flat 15, 103064 Moscow, Russia, ph: +7-095-9162505, e-mail: gis@glas.apc.org.*

✉ *UREK company: Krasnaya str. 124, room 1103, 350015 Krasnodar, Russia, ph\fax: +7-8612-575233.*

✉ *Central Regional Hospital, 350 086 Krasnodar, 1-st Maya str., 167, Russia, ph:+7-8612-578911, fax:+7-8612-603512*



88 m^2 solar collector installed at the Krasnodar Hospital, Russia. Photos by E. Gismatullin

Doubling Wealth, - Using Half of the Resources

The new report "Factor Four" documents how it is possible to increase energy and material-use efficiencies four times. This efficiency revolution could be used to double wealth and cut resource use to half in the industrialised world.

More for Less-Efficiency Cure

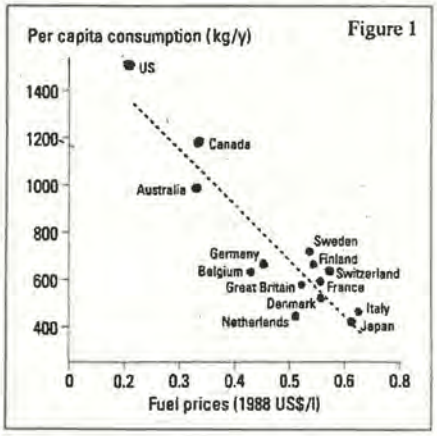
Efficient use of resources can result in meeting the overriding imperative for the future: sustainability. The report is about "Doing more with less," which "is not the same as doing less, doing worse or doing without."

It offers a quantitative formula. It shows how at least FOUR times as much wealth can be extracted from the resources that we use.

Solution to Growth Limits

In 1972, the Club of Rome sent shockwaves around the world with its report 'Limits to Growth' by arguing that we were rapidly running out of essential resources. This new report to the Club of Rome offers a solution. The proposed answer: use resources more efficiently, in ways that can already be achieved, often not at a cost, but at a profit. There is an amazing potential for increasing resource productivity via an efficiency revolution.

The profit will increase, pollution and waste will decrease, and the quality of life will improve. Moreover, the benefits will be shared: 'progress' will no longer depend on making ever fewer people more productive. Instead, more people and fewer resources can be employed.



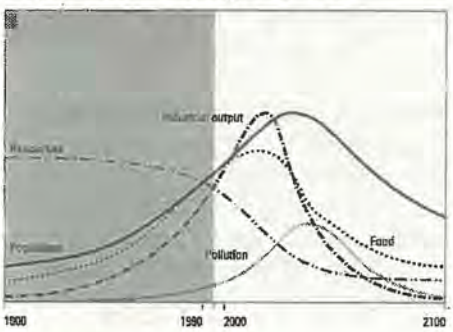
50 Examples of Productivity

Examples from Europe and America, demonstrate 4 to 10 times increase of resource productivity, showing how much more could be generated from much less. Of the 50 examples, 20 deal with energy, 20 with materials, and 10 with transport.

In the area of energy, the examples include: refrigerators and lighting (see both on the next page), windows, office equipment, household appliances, house renovations, passive solar houses, and air conditioning.

We may have 50 years left?

If efficiency is made a high priority worldwide in the next 50 years it will slow the consumption of resources. This was simulated by updating the world system model made for the 'Limits to Growth' report. The report's recommended formula for an efficiency revolution was injected into the model which shows that the world resources are limited by simulating the exponentially increasing consumption and the exponentially decreasing resources. (see figure below)



Let Prices Speak

There is a fear that efficiency gains won't do the trick. Efficiency may help to buy time but will not, by itself, produce a lasting reduction of resource consumption - not as long as resource prices keep telling a seductive fairy tale of unlimited availability.

If market prices still will not show the true picture, there is a danger that the "factor-four revolution" would be overtaken by increasing unnecessary consumption of goods and services, leaving unaddressed the need to reduce overall resource use, which is a must to achieve sustainabilty.

4 reasons to support the political feasibility to increase resource prices:

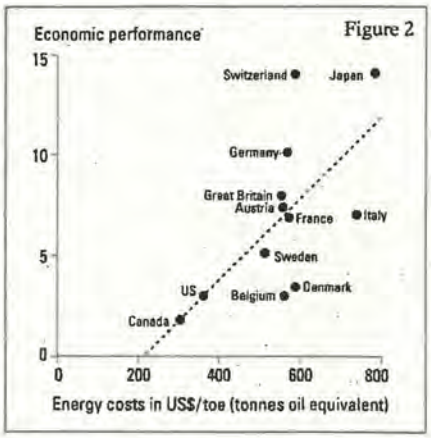
- Fuel prices correlate negatively with fuel consumption (figure no.1)
- Energy prices correlate positively with economic performance (figure no.2), not negatively as conventional wisdom from the industrial lobby suggests. Cheap-energy economies tend to be wasteful and uncompetitive, while dear-energy economies tend to be ingenious, innovative, and highly competitive.
- Higher resource prices are justified as a means of internalising external costs, which produce additional wealth and make countries richer, not poorer.
- A fourfold increase in resource productivity is technologically available and often cost-effective, so no loss of well-being must be feared from rising resource prices.

Factor 4 is Not Enough?

The "Factor Four" improvement in productivity would make ecological rucksacks lighter by that factor. This may not be enough for ecological sustainability.

Even in the best scenario, the dramatic increase of population growth would almost inevitably lead to conflicts over land and resources which may lead to epidemics or wars. The report suggests that we should seek a better understanding of the relationship between economic growth and green economics as well as the non-economic and non-material values of our civilization. We should keep in mind the message of the Earth Summit'92: there is no longer any way of separating environment and development.

Environmentalist do say that what is needed is improvement by a factor of 10 in the industrialised countries to combine 50% of worldwide reduction of material turnover with growth in developing countries.



Lamps and Lights

Example from "Factor Four" Report

90% Can Be Saved on Lighting

With better lighting equipment, lighting, and lamp design techniques, more than 90 % of the energy used on lighting can be saved very cost-effectively. Throughout world, 10,000 million ordinary incandescent lamps are used per year. Just imagine how much energy could be saved by using efficient bulbs instead!

25% of all electricity used in the US goes directly into lighting. That is about as much electricity as 120 giant power plants generate. In countries like Russia or China, roughly 15 x 1,000-MW power stations are fully occupied just running inefficient lights.

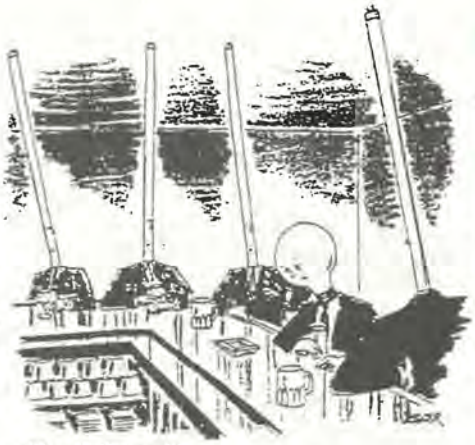
Time to Retire Edison's Old Bulb?

An 11W compact fluorescent bulb replaces a 60W incandescent light bulb and lasts 10 times longer.

50% of the energy used in the US for lighting, as well as a higher fraction in most developing and former socialist countries, is used on ordinary incandescent light bulbs, which have advanced only modestly since the 1930s. Such lamps are actually electric heaters emitting 10% of their energy as light. Nearly all of them can be replaced by compact fluorescent lamps pioneered in Europe, introduced in the US in 1981, and now selling over 200 million units a year worldwide, rising by 15-20 % per year. The ones sold in 1994 alone will save at least $5,000 million in electricity costs over their lifetimes. The compact fluorescent lamps also last about 10 times as long as the ordinary incandescent ones, so, their 200-million-unit-per-year sales are equivalent to 2,000 million per year, or about 20% of global market share, in terms of light delivery.

Tubular fluorescent lamps are efficient, but they are often used in ways where the light produced is not utilised efficiently. That is why 80-90 % of energy can be saved.

Tubular fluorescent lamps use 50 % of the US lighting energy, and an even higher fraction in many other Western countries. Around 80-90 % of that energy is wasted. There are also several technical improvements which are possible at its design of shape, fixture, colour, control, and frequency.



"Laugh if you will,
but my kind once ruled the earth."

Drawing by Ziegler, © 1991 The New Yorker Magazine Inc.

Lighting Design and Use

Savings are often achievable by improving how the light is used, e.g.:

- instead of over lighting the whole space, use less general or 'ambient' lighting and add 'task lighting' just when and where you need it.
- Provide the right amount of light for the task by being able to adjust the lighting level to the current needs.
- Use lighter-coloured carpets, paint and furniture to help light bounce around the room better.
- Bounce daylight deeper into the building by e.g., glass tops, light shafts etc.
- Use electronic controls to dim the lamps according to how much daylight is present, turn them off when there's already enough daylight or when nobody is in the room.

Profitable Pollution Prevention

Upgrading the efficiency of light bulbs prevents pollution not at a cost, but at a profit, when it is cheaper to save energy than to produce it.

A single 18-Watt compact fluorescent lamp replacing a 75-Watt incandescent lamp can save over its lifetime:

- 1 tonne of CO_2, 4 kg sulphur oxides, and 1 kg nitrogen oxides, among other emissions from a coal-fired plant or
- 0.5 curie of strontium-90 and caesium-137, as well as 0.4 tonne TNT-equivalent of explosive plutonium, from a nuclear power plant or
- 200 litres of oil fed into an oil-fired power station - enough to drive an ordinary US family car 1,600 km.

Refrigerators

Example from "Factor Four" Report

86% savings between 1972-88

From 1972 until the early 80's, manufacturers discovered 86% reduction possibility in the needed energy per litre of cold space. In the USA, energy requirements of the average standard models have dropped as shown below:

- 1972, 3.36 kWh/y
- 1987, 1.87 kWh/y
- 1990, 1.52 kWh/y
- 1993, 1.16 kWh/y
- 1994, 1.08 kWh/y
- 1998, 0.86 kWh/y

Even more efficient models are available for example:

- In the USA a solar-power model was developed by San Frost with 0.45-0.53 kWh/y in the early 80'.
- In Denmark 0.45 kWh/y has been attained by Gram in 1988, which is readily reducible to 0.26 kWh/y.

The dramatic improvement is due to the use of more insulation, better seals, better designs, and bigger coils, as well as more efficient lights, compressors, and controls.

Further energy savings are possible with the use of new insulating materials and separately optimised compressors.

Widespread use of efficient refrigerators would reduce energy consumption significantly in the industrialised countries, where most households have at least one refrigerator. For example, American refrigerators and freezers used 6% of all residential electricity in the late 80's, equivalent to the output of 30 Chernobyl-sized power stations.

Even more importantly, a small solar-powered medical refrigerator may mean the difference between life-saving vaccines and fatal disease in the villages of the developing countries.

More Information:
This article on page no. 16-17 is based on the book:
"Factor Four: Doubling Wealth, Halving Resource Use"
By Ernst von Weizsäcker, Amory Lovins, Hunter Lovins.
Earthscan Publication ltd:120 Pentonwille Road, London N1 9JN, UK
See publication list on page no. 18.

Publications

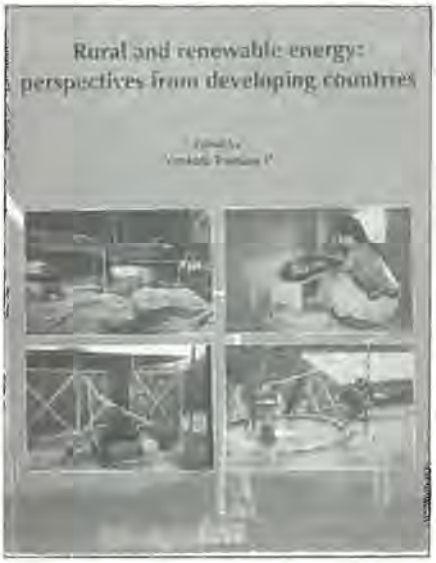
Case Studies in Environmental Adult and Popular Educations
Published by INFORSE, International Network for Sustainable Energy and LEAP, Learning for Environment Action Program. Edited by Darlene Clover and Shirley Follen.
Case studies from Argentina, Canada, Denmark, Fiji, Mexico, Philippines, India, Malaysia, Senegal, Uganda, and Zimbabwe. 58 p., 1997
Contact: INFORSE, PO Box 2059, 1013 Copenhagen K, Denmark.
Ph: +45-3312 1307, fax: +45-3312 1308, e-mail: inforse@inforse.dk.

Renewable Energy Technologies in Africa
By AFREPREN/FWD, INFORSE regional co-ordinator. 269p, 1997.
Contact: Zed Books Ltd, 7 Cynthia Street, London N1 9JF, UK.
See article on page no.8.

North-West Russia: Energy Report
Final report commissioned by Greenpeace International.
Edited by Felix Matthes by Öko-Institute, Germany. 57 p., May 1997
Contact: Öko Institute, Binzengrun 34a, 79114, Freiburg i.Br, Germany.
Ph: 761-452-950, fax: 761-475-437.

The Perspectives of Wind Energy Development in Kola Peninsula
Scientific report. By Valeri Minin, Grigori Dmitriev, Kola Ecological Centre GAIA, Energy Information Centre, Apatity, Murmansk, Russia. 95 p.
Contact: Dag A. Hoystad, Norges Naturvernforbund, Postboka 6891, St Olavs plass, N-0130 Oslo, Norway. Ph: +47-22993300, fax: +47-22993310, e-mail: naturvern@sn.no.
See article on page 12.

Renewable Energy Strategies for Europe, Volume II
Electricity Systems and Primary Electricity Sources
By Michael Grubb and Roberto Vigotti, Energy and Environmental Programme, The Royal Institute of International Affairs (RIIA), UK., 231 p. 1997, 14.96 L. Earthscan Publication.
Contact: RIIA Chatham House, 10 St James's Square London SW1Y 4LE, UK. Ph: +44-171-9575711, fax: +44-171-9575710, email:eepriia@gn.apc.org.



Rural and Renewable Energy: Perspectives from Developing Countries
Edited by Venkata Ramana P. 317 p.

Biogas: The Indian NGO Experience
By Soma Dutta, I.H. Rehman, Preeti Malhotra, Venkata Ramana. 123 p.1997,
See article on page no. 14.

Population, Environment and Development
Proceeding of Conference, 13-14 March, 1996, Washington DC. USA.
Edited by R.K. Pachauri, Lubina F. Qureshy, Foreword by Maurice Strong 357 p.

Biomass Energy Systems
Proceedings of Conference, 26-27 February 1996, New Delhi, India.
Edited by Venkata Ramana P., Srinivas S.N., 478 p.
Contact: TERI, Tata Energy Research Institute, Darbari Seth Block, Habitat Place, Lodhi Road, New Delhi, 110003 India.
Ph: +91-11-4622246, fax:+91-11-4621770, e-mail:mailbox@teri.ernet.in.

The Future for Renewable Energy Prospects and Directions
Result of a 2 years consulting process with 40 European R&D Centers. Goals and "R&D Roadmaps". 8 energy fields: biomass, ocean, PV, small hydro, solar thermal, wind, combined heat & power. 224 p, 1996, $60, James & James Publication
Contact: European Renewable Energy Centers (EUREC) Agency, Kapeldeef 75, B-3001 Leuven, Belgium.
Ph: +32-16-281-522, fax: +32-16-281-510, e-mail: palmersimec.be.

World Directory of Renewable Energy Suppliers 1997
The 3rd edition. 472 p. Classified and alphabetical listing of companies and listing of organisation and articles.
Edited by Bruce Cross
Contact: James & James 35-37 Wiliam road London NW1 3ER, UK. Fax: +44-171-387-8998, e-mail: wdress@jxj.com, http://www.jxj.com/dir/wdress.

Factor Four
Doubling Wealth, Halving Resource Use
By Ernst von Weizsäcker, Amory Lovins, Hunter Lovins
322p. 1997.
See article on page no. 15-16
Contact: Earthscan Publication ltd: 120 Pentonwille Road London N1 9JN, UK. Ph: +44-171-2780433, fax: +44-171-278-1142, e-mail: earthsales@earthscan.co.uk, http://www.earthscan.co.uk.

Implementing Agenda 21
NGO Experiences from Around the World
Country experiences from Caribbean, Ghana, India, Pakistan, Russia, Scotland, Slovenia, South Pacific and Zambia.
Contact: United Nations Non-Governmental Liaison Service (UN-NGLS), Palais de Nations, 1211 Geneva 10, Switzerland. Fax: +41-22-788 7366, e-mail: suroor.alikhan@unctad.org .

Climate Change Information Kit
60 page information, 1997
Published by The United Nations Environmental Programs Information Unit for Conventions.
Contact: UNEP/IUC, Geneva Executive Center, C.P. 356, 1219 Chatelaine, Switzerland. Ph: +41-22-9799244, fax: +41-22-7973464, e-mail:iuc@unep.ch, http://www.unep.ch.

Energy Subsidies in Western Europe
Contact:Greenpeace International Climate Campaign, Keizersgracht 176, 1016 DW Amsterdam, Netherlands, ph:+31-20-523 6222, fax: +31-20-523 6200, http://www.greenpeace.org.
See article on page no.13.

Humanity CD-Rom:
Humanity Development Library for Sustainable Development and Basic Human Needs. 700 books and 16 periodicals on one CD.
See article on back page.

Events

★ Event with INFORSE participation

September 8-12, 1997
3rd International Conference on New Energy Systems and Conversions, Kazan, Russia
Info: Kazan State Technical University, K. Marx St. 10, 420111 Kazan, Tatarstan, Russia.
Ph: 8432-385260, fax:8432-366032,
e-mail:root@kaiadm.kazan.su.

September 16-17, 1997
3rd Exposition and Symposium for New and Renewable Energy Equipment Tripoli, Libya
Info: International Energy Foundation (IEF),
PO Box 83617, Tripoli, Libya.
Ph: 218-21-3331832, fax: 218-3331831.

September 26-28, 1997
LUX Jun'97, 3rd International Junior Forum for Lighting Technology, Ilmenau, Germany
Info: TU Ilmenau/LITG, German IES, Fachtgebiet Lichttechnik, P.F. 100565, 98684 Ilmenau, Germany.

October 6-9, 1997
EWEC'97,
Dublin Castle, Ireland, UK
European Wind Energy Conference
Info: WCT International, 6A Old Dunleary Road, Dun Laoghaire, Country Dublin, UK.
Ph: +353-1-2805733, fax: +353-1-2805740.

October 13-16, 1997
3rd LUX PACIFICA '97,
Nagoya, Japan
Info: Illuminating Engineering Institute of Japan, Shormel Gakkai (IEI-J), Suitaya Building, 2-8-4 Kandatsukasacho, Chlyoda,
Tokyo 101, Japan.

October 14-16, 1997
Asia Pacific Initiative For Renewable Energy & Energy Efficiency, Jakarta, Indonesia
Info: Alternative Development Asia, 5F, 3 Wood Road, Wanchai, Hong Kong.
Ph/fax: +852-2574-9133/-1997,
e-mail: altdev@hk.super.net.

October 15-16, 1997
Decentralised Cogeneration & The Climate Change Challenge, Brussels, Belgium
4th Annual Conference and Exhibition
Info: COGEN Europe, rue Gulledelle 98 - 1200 Brussels, Belgium
Ph: +32-2-772-8290, fax: +32-2-772-5044,
e-mail: cogen_Europe@compuserve.com

October 29-31, 1997 ★
INFORSE Workshop,
Buenos Aires, Argentina.
Info:REJIMA, att. Marcelo Alvarez & Roque Pedace, Mario Bravo 1029 piso 4 depto A, 1175 Buenos Aires, Argentina.
Ph/Fax: +54-1-963-0722,
e-mail: aldarba@starnet.net.ar or
rq@rejima.uba.ar.
See article on page 10.

November 7-8, 1997★
NGO Strategy Meeting on the Road to Århus, Lake Bled, Slovenia
Preparation of Århus'98, European Energy Conservation Strategy, etc.
Info: The European ECO Forum Secretariat, P.O. Box 4440, Metelkova 6, 1000 Ljubljana, Slovenia, Ph: +386 61 1322354, Fax: +386 61 1337029/ 572 468, e-mail: albin.keuc@k2.net.

November 10-12, 1997
Energy Efficiency in Household Appliences, Florence, Italy
Info: AIEE, Ph:+39-6-3227367,
fax:+39-6-3234921, e-mail:aiee@euronet.it.

November 10-12, 1997
World Photovoltaic Power '97, San Diego, California, USA
Info: PO Box 250, Gorham, Maine 04038, PH: +1-207-892-5445, fax: +1-207-892-2210,
e-mail: gorham@goradv.com, http:www.goradv.com.

November 18-19, 1997★
European Energy Conservation Strategy, Group of Country Designated Experts
Info: UN-ECE, att. Mikhail G. Kokine, Palais de Nations 1211 Geneva 10, Switzerland.
Ph: +41-22 917 1234, fax +41-907 0107,
e-mail: mikhail.kokine@unece.org.

November 19-21, 1997
RIGHT LIGHT 4, 4th European Conference on Energy Efficient Lighting, Copenhagen, Denmark
Info: Gert Nielsen, Association of Danish Electric Utilities, Resenøms Alle 9, 1970 Frederiksberg C, Denmark. Ph/fax: +45-31-390111/-395958,
e-mail: def@danel.dk.

1-3 December, 1997
SOLAR'97, Canberra, Australia
Australian and New Zealand Solar Energy Society Conference
Info: PO Box 1402, Dee Why, NSW 2099, Australia.

December 3-6, 1997
InterLight '97, Moscow, Russia
3rd International Trade Fair for Lighting and Light Technology
Info: Ost-West Partner, Office Weiden. Ph: +49-9-611480, fax: +49-9-4160399, Office Moscow: Ph:+7-095-2991812.

December 8-9, 1997★
Baltic Sea Region Agenda 21, Energy Workshop
Info: Danish Energy Agency, att. Marie Louise Lemgart, Amaliegade 44, 1256 Copenhagen K.
Ph: +45-33926700, fax +45-33114743.

December 11-12, 1997
Climate Convention, 3rd Conference of the Parties, Kyoto, Japan
Info: Secretariat for the Framework Convention on Climate Change, PO Box 260124,53153 Bonn, Germany.
Ph: +49-228-815-1000, fax: +49-228-815-1999,
e-mail: secretariat@unfccc.de.

March 5, 1998
World Efficiency Day, Wels, Austria
Info: O O Energiesparverband, Landstr. 45, 4020, Linz, Austria. Ph: +43-732-6584-4380,
fax: +43-732-6584-4383, e-mail: esv1@esv.or.at.

March 23-25, 1998
Global Small Hydro Conference, Hangzhou, China
Info: PO Box 607, Hangzhou, 310006, China.
Ph: +86-571-7055491, fax: +86-571-7055492,
e-mail: hic2pub.zjpta.net.cn.

April 13-17, 1998
International Workshop CUBASOLAR'98, Habana, Cuba
Science Development and Solidarity
Info: SOCIE, Calle Luz No. 375, e/ Picota y Compostela. Havana Vieja, C. Havana, Cuba.
Ph: 537-612846, fax: 537-331732 and 332699.

May 25-30, 1998
AGROENVIRON 98, Pakistan
Towards 21st Century,
International Symposium
Info: Faculty of Agricultural Engineering & Technology, University of Agriculture, Faisalabad, Pakistan. Ph: +92-41-3028189/ext 434, fax: 92-41-647846 / 30769.

June 8-11, 1998
Biomass for Energy and Industry, Würzburg, Germany
10th European Conference and Technology Exhibition
Info: WIP, Sylvensteinstr. 2, 81369, München, Germany. Ph: +49-89-7201235,
fax: +49-89-7201291, http://www.wip.tnet.de.

June 23-25, 1998★
Environment for Europe, 4th Pan-European Conference of Environment Ministers (Århus'98), Århus, Denmark
Info: Danish Environmental Agency, Strandgade 29, 1401 Copenhagen K.
Ph: +45-32660295, fax +45-32660296,
http://www.mst.dk/aarhus-conference.

Contents:

Sustainable Energy News on CD-Rom

Now all previous issues of Sustainable Energy News are available on one CD-Rom together with 15 other periodicals and 700 books, including the Sustainable Energy Handbook. This is the achievement of the "Humanity CD-Rom Project" that started the production of this well-compressed CD-Rom in July. The aim of the project is to provide a library of 3000 titles for people involved in work with development and meeting basic needs. The CD is the first of a series of 5. It requires at least a 66 MHz 486 PC-computer. It will be distributed via existing networks. You can also contact:

✉ *Global Help Project*
Oosterveldlaan 196
B-2610 Antwerp, Belgium.
E-mail : humanity@innet.be.
💻 *Web site : http://www.oneworld.org/globalprojects/humcdrom.*

Renewable Energy Islands

Many smaller islands have very favourable conditions for renewable energy, - but do they use it? To answer this question, two INFORSE organizations are looking for examples of:

- islands with practical experience in renewable energy supply, and
- islands planning to cover more than 50% of their energy demands with renewable energy.

Based on the answers, Forum for Energy and Development (FED) and the Danish Organization for Renewable Energy (OVE) will prepare an overview of renewable-energy initiatives on islands. This overview will be one of the preparations for an international conference on renewable energy for islands that is planned for 1998 in Denmark. The conference is planned in connection to a government initiative to switch a Danish island with 5,000 - 10,000 inhabitants entirely to renewable energy sources.

Any information on existing & planned renewable energy projects for islands is welcome.

✉ *Please send your information to Sustainable Energy News*