SUSTAINABLE ENERGY NEWS

Newsletter for INFORSE International Network for Sustainable Energy. No. 41, June 2003

Mobile Exhibition, Romania
INFORSE - Europe Seminar
Urban Poor Electricity Access

Sustainable Energy News
ISSN 0908 - 4134
Published by:
INFORSE

International Network for Sustainable Energy (INFORSE)
is a worldwide NGO network formed at the Global Forum in Rio de Janeiro, Brazil, 1992.

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Deadline for the next issue:
15. 08. 2003
Next issue: *September 2003*

The newsletter is quarterly.
Feel free to use the information, but please state the source.

Annual subscription rate:
EUR 25/year. Plus bank cost at checks: EUR 10.
The newsletter is free of charge to INFORSE members as long as possible.

Printed:
Husets Trykkeri
Århus, Denmark.

Photo on the front page:
Children looking at the Mobile Exhibition made by INFORSE-Europe in Romania. See article on page 4.

Photo by Gunnar Boye Olesen INFORSE-Europe/OVE.

How to Take the Lead in Renewables?

Photo: NegMicon

Since the World Summit in Johannesburg, 'renewable energy' has remained a popular catch phrase among world leaders. While supportive words are fine, they must be followed by actions.

In this respect, the coalition of countries that declared their support for renewable energy and targets in Johannesburg seems willing to take the lead.

With a large conference for renewable energy in Bonn, June 2004, and preparatory conferences in the world regions before that, the stage is set for progressive plans and actions.

The coming months will show whether this 'group of willing' countries will succeed where the Johannesburg summit failed: in setting ambitious but realistic targets and timetables for renewable energy, leading to a transition to sustainable energy.

The success is largely dependent on the 'homework' of the countries: they should develop targets and strategies in open processes in dialogue with their respective national stakeholders. The targets should go beyond 2010: targets for 2015 and 2020 are important to guide energy investments with lifetimes of 20-40 years.

The plans and strategies should recognize that concerted actions by the countries involved can lead the technological development and thereby reduce the costs of the transition.

The countries in the coalition have more than 300 million of the richest citizens in the world, as well as some of the poorest - more than enough to create prosperous markets for a large number of renewable energy solutions.

In addition to targets and plans, national debates are indispensable for long-term successes. The debates should focus on the many different aspects of renewable energy and on an energy transition.

In the current economic situation with historically low interest rates and increasing unemployment, renewable energy has a more positive impact on the society than before, because it replaces the use of finite oil and gas resources with labour-intensive investments. And if the global climate is much more sensitive to greenhouse gases than previously estimated, CO_2 emissions should be cut fast, preferably with a steep increase in the use of renewables and energy efficiency. Also the full cost of different energy sources must be highlighted, as well as the many subsidies to the fossil and nuclear industries.

The true leaders for renewable energy will be countries that in a participatory way develop targets and strategies for renewable energy-targets and strategies that address the needs of the people, including the many that do not have adequate energy supply today.

Hopefully, the initiative started in Johannesburg and the subsequent coalition will foster many such leaders. The coming year will show.

Gunnar Boye Olesen
INFORSE Coordinator

INFORSE will Follow Renewable Energy Coalition

The coalition of countries for renewable energy that was started with the declaration for renewable energy by 70 countries at the summit in Johannesburg is gaining momentum.

The Coalition's meeting at the EU Commission's Green Week, (June 4, 2003) stoked the considerable interest in the initiative.

The next steps will be a series of international conferences in the world's regions during the fall of 2003 and the beginning of 2004, including a conference in Denmark in September and in Kenya in November. They will lead to the large renewable energy conference in June 2004 in Bonn, Germany. One of the central issues will be developing targets for renewable energy, but the coalition is not limited to target-setting; it also deals with many other aspects of renewable energy promotion.

INFORSE as well as many other NGOs will follow the development of the coalition. From INFORSE, we will use our influence to push for

- open, participatory processes to develop targets as well as strategies to implement them,
- strategies that include the social aspects, including the provision of adequate energy services to those who lack it today,
- realisation of targets and strategies, as well as preventing some countries in the Coalition giving lip-service to renewables while they cut down support for renewable energy nationally and internationally.

More info about the Johannesburg Coalition on Renewable Energy: http://europa.eu.int/comm/environment/climat/johannesburg.htm (04/03/2003)

Global Warming Could Come Fast

While we normally do not cover news from climate science in Sustainable Energy News, there is an increasing number of worrying reports, indicating that the harmful effects of greenhouse-gas emissions are worse than previously indicated. This is in stark contrast to the decreasing of focus on climate change among politicians as well as among people in several countries.

The "New Scientist" reports from the "Earth System Analysis for Sustainability" workshop in Berlin, May 25-30, that smoke and aerosols from burning fossil fuels, crop waste, and rainforests are clouding our view of global warming, protecting the planet from perhaps three-quarters of the man-made greenhouse effect. The effects of the aerosols were found to cut the global temperature as much as 1.8 °C, while previous research have found that aerosols reduced the global temperature by only 0.2 °C. That might sound like good news, but the experts said that as the smoke cover diminishes in coming decades with cleaner energy use, nature conservation etc., we are in for a dramatic escalation of global warming.

The warming could be two or even three times as strong as current, official best guesses. This was the dramatic conclusion of the workshop, where top atmospheric scientists got together.

Read more:
New Scientist, June 4, 2003
www.newscientist.com/news/news.jsp?id=ns99993798 or
www.fu-berlin.de/dahlem

CSD Energy in 2006-07

At this year's meeting in the UN's Commission for Sustainable Development (CSD) in April, it was decided to give priority to energy in 2006-2007. It will be included in the second of six two-year "thematic clusters" that were accepted as the future structure of CSD's work.

The thematic cluster for 2006-07 will include energy as well as climate, air pollution, and industrial development.

In 2006, there will be a review session, and in 2007 there will be a policy session of CSD, proposing policies on the issues.

Read more at:
www.un.org/esa/sustdev

REEE - Partnership

One of the many energy partnerships presented at the summit in Johannesburg last year was the Renewable Energy & Energy Efficiency Partnership (REEEP), a partnership of countries, NGOs, and businesses with the UK as the lead partner.

Its key objectives are to identify and remove market barriers to and increase financing for renewable energy and energy efficiency technologies. One focus of the partnership will be on the roles energy market regulators can have to let renewable energy into the markets. This might lead to creation of international network(s) of regulators.

The partnership has organised two expert workshops on financial and policy barriers to renewable energy.

The next step of the partnership will be regional consultations during July and August. NGOs can join the partnership via its website (www.reeep.org).

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www.reep.org.

INFORSE-Europe Activities

By Gunnar B. Olesen and Emil Bedi, INFORSE-Europe

New eco-training center, where the seminar will be held.

Pan-European Sustainable-Energy Seminar, Sept. 30 - Oct. 4 2003

A draft program of the seminar is now available on the INFORSE-Europe website. Highlights from the program are:

- Introduction to and guided tour of the unique Center for Alternative Technologies in Wales

October 1:

- Highlights of sustainable energy solutions: Windpower, wave power, super low-energy houses, technologies for a solar revolution, electricity efficiency, the road to sustainable transport
- Roles of NGOs in the development and use of the solutions.

October 2:

- EU renewable-energy directives for electricity, transport, and heat
- EU promotion of sustainable energy
- European nuclear policies
- Pan-European cooperation for sustainable energy
- Structural funds for accession countries: opportunity, or catastrophe for sustainable energy?
- EU emissions markets – what will they bring?
- Open & competitive energy markets: New EU market directives, UK experience with renewables and efficiency, Central European experience, Roundtable discussion

October 3:

- Sustainable development in practice – visit a number of exciting sites in Wales

October 4:

- Global Cooperation on Sustainable Energy: Renewable Energy & Energy Efficiency Partnership (REEEP, UK-based), EU energy partnership for poverty alleviation, and others
- Coalition of the Willing, renewable-energy target-setting, international sustainable energy institution, renewable-energy conference in Bonn, June 2004
- NGO Cooperation and funding, possibilities and constraints for future NGO cooperation for sustainable energy.
- INFORSE-Europe meeting: discussion of activities during 2002-2003, presentation of plans for 2004, working groups on future activities, priorities, & NGO Cooperation. Adoption of action plan and work programme for 2004.

Read the full draft program and find the application form at www.inforse.org/europe or send an e-mail to: ove@inforse.org .
The fee for the conference is 300 EUR, including food and accommodation.

Sustainable Energy Exhibition & Vision 2050 in Romania

May 12, a mobile exhibition on renewable energy and on energy efficiency started in Romania, organised by Prietenii Pamantului, a member organisation of INFORSE-Europe.

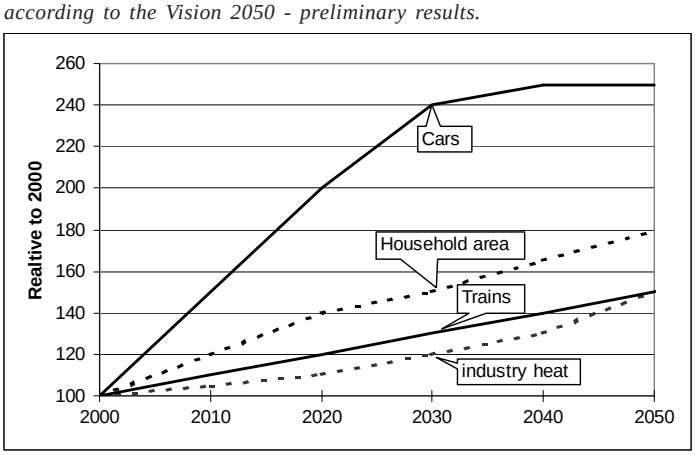
The first day it was shown in the town of Focsani, and it is shown in 18 towns throughout Romania from May, 2003.

INFORSE-Europe channelled support from the Danish Open Air Council to the exhibition.

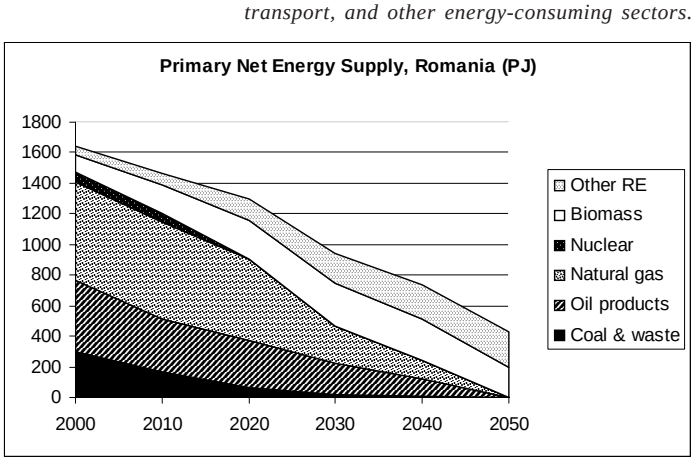
On SunDay, June 22, the exhibition will be shown in Galati. At the same time, a vision will be presented for phase-out of fossil and nuclear energy in Romania, based on INFORSE-Europe's new spreadsheet tool for Vision2050. (See the graphs on this page)

Read more about the exhibition and the vision for Romania at www.inforse.org/europe.

Expected development in heated floorspace in households, industrial heat-demanding activities, and personnel transport in Romania according to the Vision 2050 - preliminary results.



Development of the primary net energy supply for Romania, following Vision2050 – preliminary results. Because of large increases in energy efficiency, the energy supply is expected to decrease 3-4 times in spite of growth in housing, transport, and other energy-consuming sectors.



Photos on from the mobile exhibition in Romania.

Kiev 2003 & INFORSE

Pan-European Agreements for a Little More Sustainable Energy

When the Pan-European environmental ministers met in Kiev, May 21-23, they agreed:

- to continue activities to support energy efficiency, following a special statement on energy efficiency,
- to promote renewable energy, but without targets,
- to invite each other to consider implementation of new guidelines for reforming energy prices and subsidies,
- to phase-out environmentally harmful energy price subsidies, but without the deadline of 2005 agreed in 1998,
- to start cooperation on analysing economic instruments to support renewable energy.

The countries could not agree on any text on environmental problems of nuclear power, in spite of the fact that the meeting was held only 120 km from the Chernobyl nuclear power plant, the site of the worst civilian nuclear catastrophe.

These agreements were well below the expectations of most European countries, and of the NGOs in ECO-Forum. This was mainly because the USA managed to block all proposals to go further than previous international agreements. The lack of text on nuclear energy prompted 41 countries to sign a declaration in favor of phasing out any nuclear power that cannot be upgraded cost-effectively to meet international acceptable standards.

In other areas than energy the conference had more successes: the ministers signed new protocols on strategic environmental assessment, open pollution registers, and liability for international river pollution. They also started development of a strategy for environmental education.

ECO-Forum Looking Forward

During the conference, ECO-Forum organised a large number of meetings and a special session of the ministerial meeting on Environmental Policy Integration.

The ECO-Forum's Energy & Climate Group organised a workshop on renewable-energy potentials and targets, a side-event on phasing out environmentally harmful subsidies, and an issue group meeting after the conference. At the issue group meeting, it was decided:

- to send a letter to all countries that had supported the anti-nuclear declaration, to find out how many of them are in favour of nuclear phase-out, of phase-out of environmentally harmful subsidies, and of setting targets for renewable energy.
- to continue work on nuclear power.
- to continue work on energy efficiency, following the official process.
- to work on phase-out of environmentally harmful subsidies.

Gunnar Boye Olesen was re-elected as coordinator and as the group's representative to ECO-Forum Coordination Board, while Tanay Sidka Uyar, Istanbul, was elected as the second coordinator of the group.

Photos from Kiev, May 2003 by Gunnar B. Olesen. From the top: official conference; a demonstration; NGO workshop, and the exhibition of the Ukrainian "Green Energy" Magazine in Kiev.

Further information: www.eco-forum.org and www.inforse.org/europe

The ministers' statement on energy efficiency includes decisions to:

- encourage that national climate change policies should include energy efficiency
- improve integration of energy efficiency in other policy areas
- support the use of transparent economic instruments in comparison of energy efficiency and renewable-energy projects throughout the whole energy cycle
- ensure that environmental considerations are reflected in energy policy decisions, in particular in restructuring of district heating and cogeneration
- support funding of energy efficiency activities, also with Joint implementation
- strengthen the participation of other stakeholders in energy efficiency
- invite the Energy Charter Secretariat to report on implementation of international energy efficiency provisions.

EU Update

By Gunnar B. Olesen, INFORSE-Europe

Intelligent Energy Coming

EU's new program for energy efficiency and renewable energy is, in practice, agreed-on, with a total budget of 200 mill. EUR, 15 mill. EUR less than proposed by the Commission, for the 4-year period 2003-2006. The official decision is expected in July and the first deadline for proposals is expected in November, 2003.
Read more when the programme is launched: www.europa.eu.int/comm/energy/res/index_en.htm

Emissions Trading

The EU Parliament and environmental ministers are struggling to get an agreement on the directive for emissions trading before July, 2003. If they do not reach an agreement, it is likely that the directive will be delayed for at least a half year, and that the emissions cap-and-trade scheme cannot start in 2005. Among the many issues discussed is the concern of the cogeneration business that the emission-trading will make it more difficult to start new industrial cogeneration because such plants often produce higher CO_2 emissions on the spot, but lower emissions in the total electricity system.

Cogeneration

Following the EU countries' political agreement on the proposed directive, the EU Parliament proposed a number of amendments in May, 2003 including:

- a target of 18% of electricity production in 2012 produced as cogeneration
- a target of at least 20% of potential for cogeneration used by 2010
- a special regime for micro-cogeneration.

Efficient Buildings

For the implementation of the Directive on energy performance of buildings, the EU Commission has formed a committee with representatives of the EU countries and a few experts. Information from the committee about the important implementation of this directive will be available from the EU Commission, DG TREN (see INFORSE-Europe website).

Biofuels

The directive for biofuels in transport was adopted in May, 2003. In the directive, other renewable energy sources for transport are included, as INFORSE-Europe advocated. Thus, a country can decide to promote hydrogen or electric vehicles that get power from windpower, and include these in their targets. The possible environmental harm of biofuel production, which several NGOs warned against, is addressed in par 3.4, which reads: "*...the Member States should consider the overall climate and environmental balance of the various types of biofuels and other renewable fuels and may give priority to the promotion of those fuels showing a very good cost-effective environmental balance, ...*". Whether this provides sufficient protection of the environment remains to be seen; the paragraph does not guarantee in itself that agricultural pollution will not increase with production of biofuels, as INFORSE- Europe and other NGOs advocated.

This hydrogen bus could also be supported by the biofuel directives if its hydrogen-fuel is made from renewables.
Photo: Ballard Power System.

Read more EU news, sources, etc. at: www.inforse.org/europe

Unsustainable Outlook

In a new publication, the European Commission's Directorate for Research presents a "business as usual" scenario, where worldwide CO_2 emissions are expected to double worldwide by 2030, and, in the EU-25 countries, to increase by about 15%. While the report discusses the implications for energy supply and markets, it fails to discuss the catastrophic climate-change effects of such development. In the very last chapter, the report discusses a climate-mitigation scenario in which CO_2 emissions increase by "only" 68% for 1990-2030 worldwide and decrease by 15% in the EU-25 during the same period. Such large growths in CO_2 emissions certainly are possible, as the Climate Convention Secretariat also has found in a recent report. The study completely neglects more sustainable scenarios that several EU countries are following, such as the recent UK White Paper (see on page 7).

The study is based on the EU Commission's "POLES" model, which has been criticized heavily by NGOs and experts for its superficial treatment of new technologies, price changes, effects of climate policies, and other factors that can drive sustainable development. It is unfortunate that the EU Commission continues to use models and to publish reports that do not recognise opportunities and trends for development of sustainable energy.

The report "World energy, technology, and climate policy outlook 2030 – WETO", by the Directorate-General for Research, EU Commission, 2003, is available from the website: http://www.europa.eu.int/comm/research/headlines/news/article_03_06_17_en.html
The UNFCCC "Compilation and Synthesis of 3rd National Communications" is available at www.unfccc.int/resource/docs/2003/sbi/07.pdf and press release at: www.unfccc.int/press/releases/index.html (June 3, 2003)

Optimistic Solar Suppliers

In a new report supported by the EU Commission, the European Solar Thermal Industry Federation is celebrating that the 15 EU countries now have more than 10 million m^2 of solar collectors for hot water and heating, as well as about 1.6 mill. m^2 of unglazed collectors for swimming pools. Based on this, the report concludes that the target of 15 mill. m^2 solar collectors by the end of 2003 will be reached. That was the target of the EU "Campaign for Take-Off" for renewable energy. The reason for the success is the large developments in Germany, Greece, and Austria.

The report also discusses the 100 mill. m^2 target for 2010 that was launched with the EU White Paper for Renewable Energy in 1995. If the last decade's growth of 11.7 %/year continues, the target will be reached in 2022 only, but if proactive policies are introduced at EU and country levels, the target can be reached around 2015.

If solar heating is mandated in building codes, as it is done in Barcelona and Israel, the target could be reached around 2012.
The report is available at www.estif.org

Progressive UK Energy Strategy

The UK government launched an Energy White Paper at the end of March with goals of 60% CO_2 reductions by 2050, adequate heating for all, and security of energy supply.

It places strong emphasis on energy efficiency and on renewable energy, whereas no new construction of nuclear power plants is included.

The realisation of this plan would be a major step towards sustainable development for the UK, which has decreasing resources of oil and gas. The UK's goal is less ambitious than those of Germany and of some other European countries, which aim for 80% CO_2 reductions by 2050.

At the beginning of June, to ensure progress in the implementation, the UK government formed a Sustainable Energy Policy Network (SEPN), which brings together government departments with key stakeholder organisations.

Read more:
www.dti.gov.uk/energy/sepn,
www.foe.co.uk/resource/press_releases

EU Institutions Fight to Expand EU Support for Nuclear Power

By Antony Froggatt, UK

While steady progress is being made by NGOs across Europe to change the Euratom Treaty, three key legislative initiatives are simultaneously being developed that will have a fundamentally different impact on the future of nuclear power.

In the European Convention, the issue of Euratom reform remains a hot topic. In fact, too hot for many politicians to handle, and they are trying to stifle any debate. The dilemma that they face is that the Convention is mandated to streamline the EU institutions in anticipation of the enlargement to twenty-five Member States in May 2004. However, this will mean reviewing the Euratom Treaty, which has remained unreformed since its conception in 1957. The pro-nuclear forces in the EU, in particular the French Government, want to keep Euratom, as it helps them support their nuclear industry in the face of growing pressures of market liberalisation.

The Convention President is Valéry Giscard D'estaing, who when President of France ordered 43 reactors in his six-year reign and is known for his unswerving support of nuclear power. Under his guidance, the Presidium of the Convention proposed that the Euratom Treaty should be kept in its entirety and appended to the future EU constitutions, thus enshrining the Treaty in Europe's future. This proposal was met with outrage from NGOs, governments, and Convention members. Friends of the Earth Europe are now leading a coalition of over 100 groups from across the continents, determined to reform Euratom.

Nuclear Loans

One of the key tools in the Treaty's armoury for promoting nuclear power is the Euratom Loan program. This gives loans for the construction of nuclear facilities across the EU, accession countries, and the former Soviet Union. The fund is not open to non-nuclear generators and there are no similar technology-specific funds. Thus, it creates a market distortion in favour of nuclear power. The Commission has proposed to increase the funds available by a further EUR 2 billion. A leaked memo from the Commission to Member States showed that, in addition to the increase, it wanted to extend the fund to allow the construction of research reactors to be used, amongst other things, for the testing of new fuels such as plutonium fuels. The facility was being considered to complete an RBMK – Chernobyl design – of reactor in Russia, at Kursk. The European Council is currently reviewing the draft legislation. The loan facility has been increased on a number of occasions since it was introduced in the 1970s and each time its approval required unanimous support of Member States. However, proposals are being discussed to change the voting requirement to allow adoption with only majority support. This is because already a number of States, Germany, Austria, and Belgium, have signalled their opposition to the proposed increase.

Package of nuclear waste and safety

The final legislation currently under preparation is the so-called 'nuclear package', renamed 'the nuclear industry survival package' by NGOs. This comprises two directives, one on safety standards, the other on radioactive-waste management. When the package was first launched in 2002, it was stated that the directive would introduce common safety standards. However, this has now been watered down and will only require common nuclear safety principles. Consequently, there will be no EU standards, but rather pre-arranged inspections of the nuclear regulators with no guarantee that the subsequent report will even be made public. This proposal falls well short of the demands of a number of Member States. The directive on radioactive-waste management proposes very tight timetables for the identification and operation of radioactive-waste dumps, including a requirement for disposal sites for high-level radioactive waste to be operational by 2018. Were this timetable to be adhered to, it would significantly reduce the time available for scientific analysis and public consultation. Furthermore, the draft directive does not exclude the possibility of the export of waste to third countries, such as Russia, and thus increases the likelihood that the practise of waste dumping in countries with lower environmental standards will begin.

The next few months will be critical in determining the support that nuclear power will receive from the EU institutions in the future. The introduction of the liberalised electricity market requires a level playing field between electricity generators, which is slowly killing nuclear power.

The new powers proposed and the retention of the Euratom Treaty are essential components in the survival of the nuclear industry and must be stopped.

INFORSE-Europe has joined the Campaign to reform Euratom.

Further information:
www.eu-energy.com and
www.foeeurope.org/activities/Nuclear/abolish_euratom.htm

The Urban Poor – How do They Access Electricity?

By Nigel Scott – Gamos Ltd., UK.

This article presents some insights into how the urban poor access electricity supplies, including the choices made and costs paid by the poor.

The information is drawn from preliminary surveys carried out amongst low-income communities in a township in South Africa, several unauthorised colonies in Delhi, India, and unauthorised settlements in two cities of the Philippines.

Supplies to Low Income Urban Areas

• In South Africa, Khayelitsha township was chosen as the case study community, as this is a large community, which caused particular problems for the municipal utility. This was partly due to the history of non-cooperation with government bodies as part of the campaigns of civil disobedience during apartheid. PN Energy was set up and presented as an independent company – this was a joint venture between South African power company Eskom and two European companies. PN Energy only serves customers in this one township.

• Bombay-based BSES Ltd. is the distribution company for the areas of the city where the Indcare Trust (the Indian partners on the project) work with slum communities. It uses local companies as sub-contractors to provide services to low-income communities. BSES provides power directly to established customers, but its general preference is to use a single point of delivery system whereby the sub-contractor buys power through a bulk meter. It is the sub-contractor who then installs low-voltage networks to dwellings, installs meters, issues bills, and collects payments.

• Communities in the Philippines where Philrads (the Philippine project partner) works are served by privately owned distribution companies and some electric cooperatives.

Legal & Illegal Connections

In the Philippines and South Africa in particular, there is a distinction to be made between two kinds of illegal connections. The first is theft, whereby people make an illegal connection and use power, which is not metered. The second is where people in households with metered legal connections run a wire to neighbouring households. Although the energy use is metered (and paid for), this type of connection is deemed illicit by the distribution company.

Within communities considered in the Philippines, about one third of households access electricity through an illicit supply, and they make flat-rate payments to those households with the metered connections. Settlements in South Africa are well organised, and within the township in the case study, it is estimated that around 15% of dwellings are without electricity supplies. It is those in close proximity to planned settlement areas, where electricity service is available, which can gain access to an illicit connection.

It is only within the communities surveyed in India that there appears to be a considerable amount of theft. It is estimated that there are over 1,400 unauthorised colonies within Delhi city, and in most of these, the residents will use unmetered electricity.

Legal or Illegal Connections?

A common view voiced by people in low-income communities is that they would like to have a legal connection, and they are prepared to pay for their electricity. The perceived advantages of legal connections amongst residents in Delhi include:

- **Security of supply** - illegal connections are regularly cut, and sometimes the cable is taken away. There are a number of people who can cut cables, including electricity company officials, competing informal "fixers", other households (when their cables fail), and drug addicts who can sell the copper.
- **Cost** - some people with illegal connections believe that they can end up paying more than people with metered supplies. They pay for the wire, which regularly gets cut and removed, they may have to pay a local "fixer" to make a connection, and people have stories of making payments to officials to turn a blind eye to the illegal connections.
- **Quality of supply** - illegal connections are often at low voltage, especially when far from the network tapping point, with the result that only low current appliances can be used. They also complain that they can be subject to voltage spike which tend to fuse equipment, especially light bulbs.

Local residents are given equipment and training to sell vouchers for prepayment meters (South Africa) Photo: Nigel Scott

Private Sub-contractors

A building company had experience in managing loans to house buyers, so they responded to an advertisement in the paper inviting tenders to supply slum areas in Delhi, India. They have installed the entire low-voltage network, including meters in each house, for an average cost of 1,500 Rs per connection, although people can buy on credit using a loan given at 5%.

The community used to steal electricity, so the company has experienced problems with acceptance by the community, but things have settled down now. The key to their success in reducing theft is regular spot checks. They read meters to check on the meter readers they employ, and they look for illegal connections. They also have a 3-phase supply to pole-mounted distribution boxes, which makes it more difficult to steal.

This is a slum area, and potentially subject to eviction; in this event they would simply remove their equipment in the hope of using it in another location.

It is interesting to note that in the Philippines, when the distribution company would not serve slum areas because residents could not meet their eligibility criteria (e.g., land titles and building permits), it was these areas that were the main source of theft. However, this has been virtually eliminated since the requirements have been relaxed, and the companies have started making connections.

Other problems associated with illegal connections include risk of electric shock and fire. Electricity poses serious risks in informal settlements, especially where there is no access for fire appliances. There was consensus across countries that electricity causes more fires than bottled LPG (an alternative fuel for cooking), but that the consequences of a gas fire are much more severe, as it tends to cause explosions.

Approaches to Metering

Households with legal connections in all of the communities surveyed now have metered supplies, although distribution companies have taken different approaches to metering and billing.

In the South African township, the company uses prepayment meters exclusively, the majority of which are of the voucher type (customers punch in a 20 digit number). Customers make payments at appointed vendors, who issue them with the vouchers. Some vendors are installed at residential premises within the community, whilst others are located in strategic places e.g. shopping mall. In this way customers can buy electricity as and when they can afford it.

One approach adopted by a distribution company in the Philippines is to install credit meters on boards located on poles in the street, making it difficult to tap into the supply upstream of the meters.

One private subcontractor in Delhi installed a similar system where a three-phase distribution system was installed, making it more difficult to tap into, and three-phase meters and distribution boards were installed at high level on poles within the community. Credit meters were installed in households and local people are employed to take the meter readings, which are used to generate paper bills.

The Cost of Electricity

The cost of connecting a household depends not only on the type of meter used, but also on the type of installation; e.g., above ground or underground. The prepayment meters are more expensive, and the connection cost is on the order of $300, although the connection fee that the household pays is only $20. Connection costs in the Philippines and India (using credit meters) are around $30, and customers pay the full cost in the connection fee (the cost of the meters used in India is around $12). Note that subcontractors in India have flexibility on specification of installation and fees they can charge, so connection costs in other areas was up to $70 – again, paid in full by the customer.

In the Philippines, it is the local government which requires paperwork before a household can make a connection, such as land titles, tax declarations, building permits etc. Obviously, people living as squatters cannot meet these requirements, so they resort to "fixers". This is not regarded as a problem, but it does add to the costs. Whilst the average cost of getting connected (including meters, fees, wiring and fixtures) is around $70, the cost can rise to around $100 when an agent is use to make all the necessary arrangements.

Obviously, the monthly spending on electricity varies according to household income and appliances. However, preliminary indications are that poorer households are consuming less than 100 kWh/month. The unit cost is highest in the Philippines (8 cents/kWh), where consumption appears to be slightly lower; then, 6 cents/kWh in Khayelitsha; and lowest in areas of Delhi supplied by a subcontractor at 3 cents/kWh. Of households surveyed in the Philippines, expenditure on electricity is equivalent to around 5% of average monthly income, and preliminary results indicate that the figures for Khayelitsha and Delhi are similar. Interestingly, there are some communities in Delhi where people pay a monthly fee to the "fixers" to provide an illegal supply, and this fee is over 50% more expensive than paying for 100 kWh/month through a legitimate supply.

Conclusions

The experience of the communities surveyed is that the urban poor can end up dealing with sub-contractors acting as agents for licensed distribution companies. These tend to be relatively small, local companies, which can make use of local labour.

Where supplies have been made available to low income communities by private companies, they have used both prepayment and credit metering technologies, showing that both can be made to work, although prepayment is a more expensive approach.

Illegal connections are unsatisfactory as they are unreliable (wires get cut), they offer poor quality of serve such that people cannot use the appliances they want, they are dangerous, and can even be more expensive than metered supplies. For these reasons, people are generally willing to pay for legal connections, but can be frustrated by planning processes.

This ongoing research project will gather further household data on energy use and factors affecting household choices of energy supply.

This article is an output from a project funded by the UK Department for international Development (DFID) for the benefit of developing countries. The views expressed are not necessarily those of the DFID.

The contributions of EDRC at the University of Cape Town, the Indcare Trust of Delhi, and Philrads of the Philippines are gratefully acknowledged.

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E-mail: Nigel@gamos.org
http://www.gamos.org

New Renewable Opportunities in Armenia

By Artashes Sargsyan, PhD, Chairman of NGO EcoTeam, INFORSE member organisation

Increased Interest

Interest in renewable energy resources in Armenia is fuelled by the growing need to utilize the country's own energy resources, to increase the energy independence of the Republic. Presently, Armenia is highly dependent on imported fossil fuel as well as nuclear fuel for the Armenian nuclear power plant. In 2000, 78.8% of the electricity was generated on the basis of imported fuel (nuclear fuel included).

Small Hydro

The technical hydropower potential in Armenia is estimated to be 7-8 TWh/year, and the economically feasible potential, 3.2-3.5 TWh/year. The present average annual electricity generation by all hydropower stations in Armenia totals 1.6 TWh/year.

Currently, 29 small hydropower plants are in operation with a total capacity of 42.8 MW and average annual electricity generation of 0.107 TWh/year. In the last 5 years, 11 new HPPs were constructed with a total capacity of 9.86 MW; of these, only one is state-owned. 11 private HPPs with a total capacity of 25.5 MW are under construction.

According to previous research in 1997, there is a possibility of constructing 325 small HPPs with total capacity of 274 MW and total electricity generation of 0.83 TWh/year. Of these small HPPs, 38 (with a total capacity of 70 MW) were found to be most attractive. To overcome financial barriers for construction of HPPs, establishing a USAID-sponsored revolving fund is under consideration. PA Consulting (UK) is involved in this.

Solar Energy

With solar radiation about 70% higher than the European average, Armenia possesses favourable opportunities for solar energy development. During a two-year program (2000-2001), *ARMNEDSUN*, sponsored by the Netherlands, 15 demonstration solar water heaters (SWH) were installed and a joint venture, *SunEnergy* LLC, was established to manufacture solar collectors. Its standard SWH has a solar collector of 2.75 m^2 and a water tank of 140 l.

A small 800-kW grid-connected hydro power plant installed in 2000 in Armenia.

The largest solar water heating system in Armenia with total area of 64 m^2, manufactured and installed in 2002 by SolarEn LLC .

Photos by A.Ambaryan and V.Tsatryan

The current price of such a system is 1,150 USD, and it allows savings up to 65% of the energy demand for hot water for a 5-member family. The payback period is about 5 years. Currently, this company has installed more than 300 m^2 of solar collectors.

Wind Energy

The technically available potential of wind energy in Armenia has been evaluated as 1.6 TWh/year (500-1000 MW).

From 1999 to 2001, with funding from the Netherlands, the wind energy potential was re-evaluated. Results of the projects indicate potential for 100-150 MW of windpower in the Northwestern part of Armenia. Project proposals were developed for 80 kW and 20 MW wind power plants around the Pushkin pass.

SolarEn LLC has prepared a project proposal for a 20-MW wind power plant at the Sotsk pass (near lake Sevan) and continues to monitor winds at the site. The company, together with NREL (USA), is going to prepare a wind energy atlas of Armenia in 2003 with funding from USAID.

Geothermal Energy

Geothermal resources of Armenia have been estimated at 584 PJ (162 TWh-thermal). Currently, mineral-thermal water is used for health treatment purposes. According to the 1998 report of GeothermEx company on the geothermal resources of Armenia, of 18 investigated zones, the 5 most attractive areas have water temperatures in the range of 40 – 63 °C. The prospects of utilization of the Arzakan thermal waters, 30 km from Yerevan, are under investigation in the framework of a GEF/ World Bank project for a Yerevan heat supply.

Biomass

Interest is rising again in Armenia in the possibilities of biogas installations.

In the recent years, some have been established, with digester volume in the range of 3-6 m^3. Currently, Advanced Engineering Associates International (AEAI) is selecting sites and looking their feasibility. AEAI plans to establish a special revolving fund to allocate credit arrangements to the projects, but the funding is uncertain presently.

The basis for this article was a research conducted by the author, along with the UNDP/ GEF Armenia Country Study on Climate Change. The author acknowledges the valuable comments of Michael Vermishev and of Diana Harutyunyan.

(Note: 1 TWh = 1 billion kWh)

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Publications

Renewable Energies in Urban Areas 100 Examples of Good Practice

CD-ROM
In English & in French. Readable by MAC & PC with Acrobat Reader.
Published by Energie-Cités in association with the 105 municipalities concerned. It was cofinanced by the European Commission - DG TREN, as part of the ALTERNER programme.

Info: Energie Cités Secretariat, 2 chemin de Palente, 25000 Besancon France. Ph: +33 3 81653680, fax: +33 3 81507351, info@energie-cites.org
www.energie-cites.org

Cool Appliances 30% Efficiency Gains in 10 Years

Household appliances could be 30% more energy-efficient without extra costs, and meet 30% of Kyoto targets, according to a new book from the International Energy Agency (IEA).

In IEA Member countries, electrical appliances are the fastest growing energy users, after automobiles. And yet, cost-effective technology exists that could improve appliance energy efficiency by more than one-third in ten years. The new book also analyses the policy options available to boost production and take-up of more efficient models. Suggesting ways of strengthening existing appliance-efficiency programmes, it demonstrates how international collaboration can enhance those programmes.
Published by IEA. ISBN: 92-64-19661-7, 2003, 231p. EUR75
Info: www.iea.org/public/studies/2003/cool/index.htm

OPEN Energy Technology Bulletin
The above information is from IEA's "OPEN" Newsletter, a free email newsletter with news from IEA and related organisations. Subscribe at www.iea.org/impagr/cip/about_open.htm

Defend the Climate, Manual for Environmental Activists in Central and Eastern Europe

Published by Climate Action Network- CAN-CEE, Romania.
Project financed by the European Commission - DG Environment
ISBN 973-85203-7-1
92 pages, 2002, gratis.

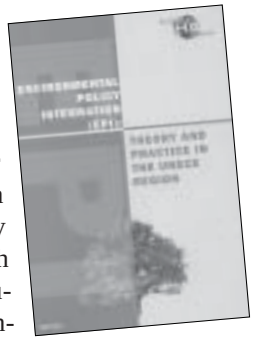
Info: TERRA Millennium III, CANCEE, Piata Walter Maracineanu, nr 1-3, etaj2 camera 171, sector1, Bucharest, Romania.
Ph: +40 21 312 68 70,
fax: + 40 722 155 110,
e-mail: terra@fx.ro,
http://terraIII.ngo.ro.

ECOvillage Living Restoring the Earth & Her People

The book is a comprehensive guide to everything you've always wanted to know about ecovillages from the tools to make them to the people behind them.
The Chapters describe: Ecological Dimension in the food production, building technologies etc.; Social Dimension; Cultural-Spiritual Dimension; and the Process of Creating an Eco-Villages. Each Chapter is illustrated with an insight of several ecovillages with many pictures.
Edited by Hildur Jackson and Karen Svenson
ISBN 1-903998-16-6
180 pages, 2002

Info: Green Books, Foxhole, Dartington Totnes, Devon TQ9 6EB, UK.
Ph: +44 1803 863260
E-mail: sales@greenbooks.co.uk, www.greenbooks.co.uk in association with Gaia Trust, Denmark, www.gaia.org

Environmental Policy Integration (EPI) Theory and Practice in the UNECE Region



Background book for the Round Table on Environmental Policy Integration at the 5th "Environment for Europe" Ministerial Conference, Kiev, May 21-23, 2003.
The publication include 25 case studies, from which 7 is about energy from Russia, Romania, Mediterranean islands, K2/R4 in Ukraine, Poland, Denmark, and EU liberalisation.
The publication has been prepared by the European Environmental Bureau on behalf of the European Eco-Forum.
Available in English and Russian.
194 pages, May 2003, gratis.
Editor responsible: John Hontelez

Info: European Environmental Bureau, 34, Blvd. De Waterloo, 1000 Brussels Belgium. Ph: +32 2 289 1090, fax: +32 2 289 1099 mara.silina@eeb.org, www.eeb.org

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London's Warming - The Impacts of Climate Change on London
Summary Report, October 2002, 24 pages.
Available in Braille version, gratis.
The study was conducted under the umbrella of the UK Climate Impacts Program.

Green Light to Clean Power - Highlights of the Draft Energy Strategy of the Mayor of London
24 pages January 2003, gratis.
Available in English, Chinese, Hindi, Vietnamese, Bengali, Greek, Urdu, Turkish, Arabic, Punjabi, and Gujarati.

Info: Greater London Authority, City Hall, The Queen's Walk, London SE1 2AA, UK. Ph: +44 20 79834100, www.london.gov.uk
www.ukip.org.uk/london/london.html

Contents

Events

Events with * means that INFORSE is participating on the event.
Underlined events means that INFORSE-Europe organises the event.

August 11-29, 2003
Summer Course on Renewable Energy, University of Jyvaskyla, Finland
Info: Ari.Lampinen@jyu.fi
http://www.jyu.fi/summerschool/
See article in SEN 39 on page 11.

*August 12-13, 2003 **
East African NGO Course on Environmental Impact Assessment (EIA), and Clean Development Mechanism (CDM), Uganda
Info: CDI, Climate & Development Initiatives
e-mail: acs@starcom.co.ug
See article in SEN 39 on page 11.

August 25 - September 26, 2003.
Windpower Course for Developing Countries
Info: sven.ruin@af.se, http://www.af.se

September 29 – October 3, 2003
World Climate Change Conference, Moscow, Russia
Info: WCCC2003@hydromet.ru
http://www.wccc2003.org

September 2 - 5, 2003
Int'l Nordic Bioenergy Conference and Exhibition 2003, Jyväskylä, Finland
Organised by FINBIO and AEBIOM
http://www.finbioenergy.fi/bioenergy2003/
e-mail to bioenergia@jsp.fi.

September 30 - October 4, 2003
INFORSE-Europe Seminar, CAT, UK.
Info: INFORSE-Europe, Ph: +45 86 22 7000, fax: +45 86 22 7096, ove@inforse.org, www.inforse.org/europe or Centre for Alternative Technology (CAT), www.cat.org.uk
See article on page 3.

October 1-3, 2003
EEDAL'03, Turin, Italy
3rd Int'l Conference on Energy Efficiency in Domestic Appliances and Lighting
e-mail: jrc-eedal03@cec.eu.int
http://energyefficiency.jrc.cec.eu.int/events

October 20-21, 2003
4th Int'l Workshop on Large-Scale Integration of Wind Power & Transmission Networks for Offshore Wind Farms, Billund, Denmark
Info: Royal Institute of Technology, Sweden.
e-mail: Thomas.Ackermann@ieee.org,
www.ekc.kth.se/workshop/offshore

October 28th- 31st , 2003
CIER 2003, Havana, Cuba.
3rd Int'l Conference for Renewable Energy, Energy Saving & Energy Education, Promoted by the World Wind Energy Association. Supported by EUROSOLAR & CUBASOLAR.
Email: cier2003@ceter.ispjae.edu.cu
www.cujae.edu.cu/eventos/cier/espanol

November 13-17, 2003
CIES 2003, Cuba
1st Int. Convention on Energy & Environment, III Symposium on Renewable Energy & Energy Efficiency (Spanish & English)
Info: oliva@ceefe.uo.edu.cu
cies2003@cies.ciges.inf.cu.

23 - 26 November 2003
World Wind Energy Conf. Renewable Exhibition, Cape Town, South Africa
Info: The World Wind Energy Association,
http://www.sbs.co.za/wwec2003
http://www.wwindea.org

December 1-12, 2003
UN Framework Convention on Climate Change, COP 9, Italy
Info: UNFCCC Secretariat, Germany.
secretariat@unfccc.int, www.unfccc.int

January 19 - February 6, 2004
NGO Leadership, Development & Social Change 2004 Gateway Course
Int'l Institute of Rural Reconstruction, Y.C. James Yen Center, Silang, Philippines
Info: http://www.global-partnership.net
http://www.iirr.org/html/International.htm
E-mail: Education&Training@iirr.org

February 4-6 2004, New Delhi, India
1st. Int'l Conf. on Renewable Energy
Info: Central Board of Irrigation & Power
cbip@giasdl01.vsnl.net.in,
cbip@cbip.org, http://www.cbip.org

February 16-19, 2004
Asia/Pacific Region Microcredit Summit Dhaka, Bangladesh
Info: info@microcreditsummit.org
http://www.pksf-bd.org/
aprm_summit_brochure.htm