

SUSTAINABLE ENERGY NEWS on EMAIL (SENSE) number 15

Welcome to the Fourteenth edition of SENSE – Sustainable Energy News by E-mail – a service of the Sustainable Energy and Climate Change Partnership (SECCP), a project of Earthlife Africa Johannesburg, in partnership with WWF, Denmark.

SENSE is published monthly and we welcome any feedback and submissions. It is edited by Elin Oettlé and Mette Nedergaard is assistant editor based in Denmark.

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1. SECCP News

Staff News

Lerato Potele, our office manager, will be back from 4 months maternity leave from the beginning of July.

Study Tour Report

A report on the SECCP's recent study tour to Denmark and Germany will shortly be available to any interested parties. The Study Tour was a capacity building exercise in renewable energy and energy efficiency and involved a range of activities including site visits, seminars and meetings with people closely involved in practical and political energy issues.

Research on employment potential from Renewable Energy

The Minerals and Energy Policy Centre (MEPC) are currently finalising their study report on the 'Employment Potential of Renewable Energy Development', which was commissioned by the SECCP following the PAMs study. The launch of this report has been postponed to allow the researchers time for further consultation, but finding should be available from next month some time. The study will give a detailed breakdown of jobs associated with various technologies, including consideration of different levels of local production and the training needed for workers to transfer from conventional energy jobs to the Renewables sector.

2. SA's sustainable energy progress

Energy Caucus Meeting

The inaugural meeting of a South African civil society Energy Caucus is due to take place this coming month. Although details are still being finalised, current plans are for it to take place on either the 18/19 July or the 25/26 July in Cape Town. For further details and invitations please e-mail Leila Mohammed at Sustainable Energy Africa (SEA): leila@sustainable.org.za

Energy Efficiency Week

The Department of Minerals and Energy (DME) will be hosting the national Energy Efficiency Week from the 20 –25 July 2003. The program includes the launch of the EBSST (Electricity Basic Support Services Tariff) at Orange Farm on Monday the 21st, (details from Gillian Saloojee: 072 483 5766; gسالoojee@icon.co.za) and the launch of Integrated Energy Centers in Limpopo, Eastern Cape and KwaZulu Natal during the week. On Thursday the 24th July, there will be a National Workshop on Energy Efficiency and on Friday the 25th a workshop in Appliance Labeling. (further information available from the office of Sandile Tyatya at DME: 012 317 9586)

This week also coincides with the Renewable Energy and Energy Efficiency Partnership (REEEP), regional consultation meeting for Southern Africa which will be held in the Magaliesberg from the 20-22 July. REEEP, launched at the WSSD last year by the UK government, is described as a coalition of progressive governments, businesses and organisations committed to accelerating the development of renewable and energy efficiency systems (REES).

Progress at the Darling wind farm

Despite a slow approval process, the Darling wind-farm in the Western Cape is proceeding, and is due to start construction later this year. The wind farm is to be the first commercial wind farm in operation in South Africa, selling electricity through the national grid to the Cape Town Unicity. The wind farm is to be situated on Windhoek farm just outside Darling in the Western Cape, where the excellent local conditions make an ideal site.

The Darling wind-farm is to be implemented by Darling Independent Power Producer (Darlipp), of which the Oelsner Group is the main proponent. Plans are for the construction of a 13MW wind-farm over the next few year, phase one to begin this year with the construction of four 1.3MW wind turbines. This will allow the supply of 13 500 000 kWh of electricity a year to Cape Town, at a cost of R65-million. The second phase will begin in 2005 with the construction of a further six 1.3MW turbines adding another 7.8MW capacity.

The project will hopefully help to stimulate the development of a local wind-energy industry, particularly as plans include a research, information, training and educational center opposite the development. The farm may also help stimulate the local economy, as European figures indicate that between 15 and 19 jobs can be created for every megawatt capacity of wind turbines installed. Wind turbines have also become tourist attractions in their own right, which would add to the Western Cape's growing industry.

The Darling wind-farm has already received an independent power producer's license from the National Electricity Regulator and has been declared a national demonstration project by the Department of Minerals and Energy. The project is hopefully just the first step in a shift to a more diverse energy base, as renewable energy sources finally get a showing in South Africa. This project alone could result in the saving of 450 000 tons coal and 1.7 billion litres of water in its 25 year lifetime, avoiding 850 000 tons carbon dioxide emissions from coal-fires electricity production.

Proposed wind energy development

CEHN (Corporación Energía Hidroeléctrica de Navarra, S.A.), a Spanish-based company, recently revealed a proposal for a massive wind energy development in South Africa. The proposal is for 1 000 MW installed wind energy capacity, and includes local manufacturing of wind turbine components, in collaboration with local suppliers and partners. CEHN are forecasting a total of 1.1 billion Euros direct investment in wind farms between 2004-2010.

They cite various advantages to the introduction of wind power, including reduced local air pollution and greenhouse gas emissions from reduced reliance on coal-fired power station, a diversification of the energy sector, and improvement of energy infrastructure. The project would include sponsorship for education in renewable energy technologies.

The plan is to set up local manufacturing of the turbine components, which would not only make the project more economically viable, but would also multiply local benefits such as job creation. EHN claims that this development would create 1310 direct jobs, with an additional 13 000 indirect jobs. The creation of a new

manufacturing industry should also empower local industries and once manufacturing is established, wind turbines can be built for export markets. The further aim of the project is to stimulate technological improvements to wind energy, and the plan therefore includes 10 million Euros for investment in a new research and development centre for wind energy in South Africa.

An important factor noted for the success of the project is the need for an adequate regulatory framework in South Africa. The proponents suggest that the initial price for wind energy be set at 50 – 55c/kWh, with a 15-year binding Power Purchasing Agreement (PPA) contract, which could be renegotiated yearly. The price for electricity could also be reduced as income increases from carbon credits. They also suggest a government target for wind energy of 1.5% - 2% of the annual total electricity, introduced gradually until 2010 and priority access to the grid for wind energy.

The project is proposed to begin in 2004 with a 49.5MW pilot project wind farm, including 33 1.5MW wind turbines. The rest of the 1000MW would be built between 2006 and 2010, after the initial assessment. The company also met with Minister Valli Moosa in June to discuss this project.

Bio-fuel crops investigated

There have recently been several proposals for the extensive planting of bio-fuel crops in South Africa, one of the favorite suggestions being for the *Jatropha* plant from Mexico, and some more recent proposals are for growing bamboo. While the increase in bio-fuels could be a valuable replacement for the use of fossil fuels, such land use needs to be considered along with all other agricultural alternatives to determine the relative benefit to South Africa as a whole. The Department of Water Affairs and Forestry (DWAF) has recently taken an interest in these proposals, as they have the potential to have a significant land-use impact in the future, and has launched an investigation into the water consumption and invasiveness of these two particular species.

Bamboo plantations have been promoted in South Africa for a range of applications such as for construction materials, for pulp and paper industries, for animal feeds and as a weaving material and bamboo is also an excellent water filter. Bamboo also has great potential as an energy supply, the uses ranging from firewood to bio-fuel and electricity generation. An additional benefit cited by proponents is that bamboo sequesters carbon dioxide from the atmosphere at four times the rate of similar areas of natural rainforest due to its high growth rate and leaf surface area.

So far the promotion has come largely from seedling growers looking for a larger market for their merchandise, seeking to stimulate more interest in Southern African markets. The main focus has been on stimulating the poorer rural agricultural sector, as farmers could get a quick return on their investment and the bamboo could have several local industry spin-offs. Although bamboo uses are well known in the East, there are few species indigenous to Southern Africa, and the use of it is largely limited to Zimbabwe.

Bamboo is touted as one of the top 5 candidates for bio-fuel production, and the proponents claim that several methods for extraction have already been developed worldwide. The high biomass production of bamboo also makes it suitable for burning for electricity production along with other biomass waste inputs such as sugarcane pulp and sawdust. Apparently 300 hectares of bamboo is sufficient to power a 40MW power plant, with the additional benefits of being able to store the fuel until it is required, which could assist with fulfilling peaking capacity.

One of the major concerns with bamboo, however, is its high water usage, particularly as South Africa is a semi-arid country with limited water resources. The water consumption of bamboo is considered to be equivalent to that of pine species and at least twice as high as that of indigenous vegetation cover. As an evergreen species bamboo also consumes water all year round, unlike the seasonal grasses it might replace. The proponents argue, however, that this is more efficient water consumption, as bamboo uses a smaller growing area for the same biomass output. What the DWAF is concerned about, however, is not that bamboo be ruled out, but that it be considered along with every other land-use – bamboo may be classified as a grass, but it will require the same regulation as other forestry applications.

A further concern is that the invasiveness of the species still needs to be determined, particularly as bamboo is difficult to remove after it has been established. Bamboo seems unlikely to spread much though, since it is generally propagated from the root, not seed-dispersed. Commercial plantations could also compromise biodiversity if large areas are used for mono-cropping for biomass use.

Similar investigations have been launched regarding the *Jatropha* plant, which is grown for its oil-bearing fruit, which can be refined to make bio-diesel. *Jatropha* also has much to offer rural communities, as it may be useful in rehabilitating degraded land; can be grown by small-scale farmers and can stimulate a new low-tech, labour intensive production process with several useful by-products. However, *Jatropha* is also a water user, and has a high invasive potential. The DWAF has yet to determine the amount of water used by *Jatropha*, and so far the species has not been demonstrated to be invasive.

It seems that ultimately the benefits of bio-fuel plantations need to be weighed up against the costs, and the relative merits of different species considered. If bio-fuel production is to have a major influence on agricultural land-use in the future, then such large-scale land-use patterns need to be assessed. Bio-fuel plantations will require restriction and regulation along with all other agricultural and forestry applications.

3. Unsustainable Energy

ELA PBMR court case to proceed

On 26 June the DEAT announced granting authorisation for the nuclear Pebble Bed Modular Reactor (PBMR) programme, i.e. a positive record of decision on the environmental impact assessment (EIA), for a reactor at Koeberg and fuel manufacture at Pelindaba and associated materials transport. The EIA has been criticised on many counts, including failure to undertake meaningful analysis of alternatives to the development.

Earthlife Africa Cape Town filed an urgent application in May for an interdict to stop the Department of Environmental Affairs and Tourism (DEAT) from taking a decision on the EIA until they had been given a hearing. They argued that they should have had opportunity to comment on the final version of EIA Report, as it contained much material that was not in the draft report on which extensive comment was made. They also argued for the right make representations directly to the decision-maker and to see all the documentary information that the decision would be based upon.

Liz McDaid of ELA Cape Town said: "In our view, the EIA process has been totally flawed. Despite considered opposition from public and environmental groups including opposition from the Cape Town local authority, despite no solution for the spent fuel, despite using consultants who had worked for Eskom for the last 15 years, and despite numerous process and content problems, the government has approved the EIA. This Pontius Pilate attitude of Government to its responsibilities is extremely worrying."

At a hearing on 3 June the Pretoria High Court did not uphold the urgent application, but the judge appeared sympathetic to their case and no costs were ordered against them. Earthlife Africa had already secured a court date for the 9th September for the continuation of their legal challenge. Consideration is now being given to appealing the latest authorisation/record of decision.

More information: <http://www.earthlife-ct.org.za> or Contact: Liz McDaid - 082 731 5643 - liziwe@earthlife-ct.org.za or Sibusiso Mimi - 021 6835182 - sibusiso@earthlife-ct.org.za

Sasol criticized for high emission levels

A recent report written by University of the Witwatersrand's Sociology Department for the UN Research Institute for Social Development has criticized Sasol for their high emissions levels around the Sasolburg area. The report, using data collected by US experts in the area, states that Sasol is responsible for emitting a range of poisonous chemicals into the Northern Free State from its coal-burning plants. Sasol is also said to be responsible for 57% of South Africa's greenhouse gas emissions from their coal-fired power stations and oil-from-coal manufacturing plant.

While Sasol have not denied the emissions figures in the report, they have tried to shift the blame somewhat by claiming that they burn only a third as much coal as other culprits such as Eskom coal-fired power stations, and deny that they are responsible for most of the country's emissions. However, this does not alter the fact that 16 highly dangerous chemicals were found over Zamdela township next to Sasolburg, seven of them carcinogenic and others with side effects ranging from brain damage to liver and kidney damage.

GroundWork, an environmental justice NGO, has been involved with the researchers in the area. They said that despite Sasol's denial of responsibility, the report has had a positive impact as it put pressure on the company to clean up its act. As Sasol has increasingly entered world markets to sell their products, other pressures such as international environmental standards have also had some effect. Sasol has also noted that the change to natural gas from 2004 will drastically reduce their emissions.

4. General Sustainable Energy News

EU Convention's energy tactics criticized

Dr. Hermann Scheer, president of EUROSOLAR and Chairman of the World Council for Renewable Energy (WCRE), recently criticized the European Union (EU) Convention's draft constitution with regards to energy policy. He claimed that its stance towards renewable energy and the continuing tolerance of nuclear energy represent two conflicting elements, which will ultimately be detrimental to the implementation of renewable energy.

The draft constitution envisions that energy policy will in future belong to the competencies of the European Union. Dr Sheer emphasized the importance of promoting renewable energy in energy policy, but pointed out that the implementation of renewable energy has to be aligned with the bureaucratic conditions of a country, which inevitably vary from country to country. He therefore sees this approach of a centralized energy competency unlikely to succeed.

In addition, while the EURATOM treaty continues to hold without restrictions, nuclear power will continue without hindrance. Combining these two approaches will tend to favour nuclear energy at the expense of renewable energies. He therefore proposes that the EU competence for energy policy be rejected as long as EURATOM treaty is still in place and nuclear energy is not abolished.

Kenyan Energy Minister voices support for Renewable Energy

At the African Energy Policy Network conference in Nairobi last month, the Kenyan Energy Minister Ochillo Ayako voiced his support of renewable energy. He called for east African countries to increase their use of renewable energy, as these resources are abundantly available to fill the current gaps in energy supply.

In his opening speech to the conference Ayako said: "Eastern Africa is endowed with abundant sources of energy that occur naturally and are well distributed, but in the field of geothermal energy, the potential is more than 7 000 megawatts,"

Britain gains new tidal energy development

Using a relatively underdeveloped renewable energy technology, a new project has been launched off the coast of Devon in southwest England to harness tidal energy to produce electricity. The project is a joint British and German endeavour that has received funding from the British Department of Trade and Industry & European Union Commission's energy programme. The project will cost up to £3 million to complete.

Although not yet linked up to the national grid, the first turbine has already begun to produce electricity in the first test runs. The project has a 300kW capacity, and is due to be linked to the grid in August. The first phase of the project includes one 11-meter rotor blade that turns at a rate of 15 to 20 revolutions a minute. The turbine is not too intrusive as it includes only one small tower above surface, the turbine itself being placed at a 20m depth. A second turbine is due to be added at end of 2004 after the technology has been further tested.

The Seaflow project is intended to become a serious competitor to wind energy in the future. Generally the electricity production is more reliable than wind and the turbines are less obtrusive. The aim is to place the

turbines in tidal farms similar to the every growing number of windfarms in Europe. The low rotation speeds mean that the turbines pose no danger to marine life. The proponents claim that tidal energy could ultimately provide up to 30% of the country's energy needs.

New developments and synergies in solar and hydrogen technologies

A Canadian company called SHEC labs (Solar Hydrogen Energy Corporation) recently announced that they had developed a new advanced solar concentrator, which could give fossil fuels some serious competition. The concentrators intensify sunlight 5000 times, and can reach 750 degrees Celsius. The new concentrators cost less than a third of the amount needed to build similar concentrators to date, and can produce energy at a price that is economically competitive with fossil fuels.

The high cost of solar technologies has been a major hindrance in establishing their widespread use. The developers of the SHEC solar concentrator put down their success in keeping costs low to their use of fairly common materials and their high accuracy on curvature from a fairly cheap manufacturing process. They claim that large concentrators are economically viable and competitive, and hope to reduce cost further in coming years to lower than that of fossil fuel technologies. The electricity produced from a standard steam generator attached to a solar concentrator costs approximately \$1 per watt capital cost. In addition, once the capital cost has been recovered there are no additional fuel costs. Although the company had been working on smaller scale units, these are currently not as economical to produce. The first of the larger models are due to hit the market 2004 once production is up and running.

There are various potential uses for the concentrator, such as for heating, distilling water, air conditioning, electrical power generation and hydrogen production. Although the concentrators have not yet been directly linked to hydrogen production, SHEC labs has developed a new technique for splitting hydrogen that will make the two technologies highly compatible. Based on a thermal-catalytic cycle, this process can split hydrogen from water at temperatures as low as 400 degrees Celsius. This appears to be something of a breakthrough, as to date such processes relied on temperatures of 3000 degrees Celsius, resulting in various associated material problems, and most hydrogen production is currently from fossil fuels. The use of the concentrator for hydrogen splitting could significantly reduce the costs of hydrogen, and act as a stimulus for the development of hydrogen fuel cell technologies.

The project has received some funding from the Canadian government for the next phase of development. This has been supported as part of that government's commitment to support clean energy technologies and reduce greenhouse gas emissions that add to global climate change.

5. SA Energy Bills

Renewable Energy White Paper progress

It appears that the Draft White Paper on Renewable Energy and Clean Energy Development has been passed on to cabinet for review.

IEP still in process

The Integrated Energy Plan (IEP), a long-awaited strategic document from the Department of Minerals and Energy (DME), is currently waiting for the approval of the Minister before being finalized and published. The DME has promised that the IEP will be released soon, since the document is essentially complete.

The IEP is intended to assist with the country's long-range planning decisions and choices about energy sources. Rod Crompton, Deputy DG of Hydrocarbons & Energy Planning emphasized that the purpose of the IEP is often misunderstood: it is not intended as a 5-year plan, but is rather a planning tool to be used to establish the best energy mix for the country. The plan is not long-term, and is likely to be repeated biennially. The current plan apparently will not exclude any energy sources, including both coal and nuclear sources, but is likely to emphasize the importance of gas and renewable sources. The plan will also give no indication of the market structure or ownership on the electricity sector.