

## Others, including Development, Economics

### 97/04809 Biomass requirements for power production: how to optimise the quality by agricultural management

Jørgensen, U. and Sander, B. *Biomass and Bioenergy*, 1997, 12, (3), 145-147.

### 97/04810 Burning alternative fuels in rotary kilns

Piant, J. and Gauthier, J.-C. *Cim., Betons, Plâtres, Chaux*, 1997, 826, 179-187. (In English/French)

There are numerous benefits to burning residues as alternative fuels in rotary kilns. These include lower energy costs and improved incineration conditions, since combustion in rotary kilns takes place at a substantially higher temperature than when burning in a conventional incineration plant. Therefore, toxic compounds are destroyed more effectively and no lasting wastes remain when compared with the incineration industry, since slag and ash may become constituents of the cement and do not affect cement quality if their percentage is kept limited. Residuals from an incineration plant, however, have to be put in a landfill. Combining knowledge and experience in incineration plants and conventional combustion equipment for rotary kilns, PILLARD has developed integrated solutions for alternative fuel firing in rotary kilns.

### 97/04811 The commission of the European Communities' (EC) demonstration and THERMIE programmes for photovoltaic (PV) applications

Yordi, B. et al. *Solar Energy*, 1997, 59, (1-3), 59-67.

The application of photovoltaic technology in Europe has been strongly promoted by the PV Demonstration and THERMIE programmes of the European Commission. The Demonstration programme began in 1979 and both it and the subsequent THERMIE programme have been managed ever since by DGXVII, the Directorate for Energy. More than 140 projects have been offered support, giving an installed capacity of over 5.7 MWp. This article discusses the aim and scope of the programmes, and highlights some of the lessons learned in the area of rural electrification. The range of projects is described and broken down into sectors. The future of the programme is summarized and a discussion of its priorities is presented.

### 97/04812 The economics of biomass in industrialized countries: an overview

Radetzki, M. *Energy Policy*, 1997, 25, (6), 545-554.

In the OECD region, biomass accounts for 3.5% of primary energy use and 3.1% of final energy consumption. Biomass is also the source of 14% of total heat produced in the region. Its role in electricity production (1.4% of total) is much less significant. Most biomass energy is consumed by households (wood burning) and paper pulp and wood industries. The political and public interest in expanded biomass use is based on the supposition that the external costs of this fuel are much smaller than those of coal, oil and gas. Comparison of full social costs are very hard to make, since uniform value measures of the respective external costs do not yet exist. The scattered and limited assessments that are available suggest that the difference between biomass and fossil fuels in this regard may have been exaggerated in policy debates, and may not be sufficient to warrant a large-scale expansion of biomass use.

### 97/04813 Marine currents—the most promising undeveloped renewable energy source

Fraenkel, P. *Energy World*, June 1997, 250, 10-11.

Significant progress has been made by IT Power in the development of a new technique for large-scale electricity generation. This technique uses kinetic energy from offshore marine currents. It is a very environmentally, clean energy resource. The method uses a turbine rotor, set to the direction of the current, preferably mounted near the surface as maximum velocity is found at this level. The author predicts that, by virtue of the enormous size of the resource and its clean and inexhaustible nature, this type of power generation will be of major importance in the next century.

### 97/04814 Promotion of renewable energy technologies in Tanzania

Kassenga, G. R. *Resources, Conservation and Recycling*, 1997, 19, (4), 257-263.

Tanzania is experiencing energy problems that are having a major impact on its socio-economic development and environment. As part of the attempt to find a solution, the country is striving to exploit its renewable energy potential. This publication highlights the prevailing energy situation in Tanzania and provides a short review of potential energy resources. Current institutional efforts and capabilities in research, development, diffusion and commercialization of renewable energy technologies are subsequently discussed. The paper also identifies some barriers to promotion of renewable energy technologies. Finally, it outlines the energy policy of Tanzania and actions taken by the government of Tanzania to promote renewable energy technologies.

### 97/04815 The renewable energy market beyond NFFO

Porter, D. *Energy World*, June 1997, 250, 8-10.

The Non Fossil Fuel Obligation (NFFO) process is almost completed following the announcement of the fourth order earlier in the year. This means that the renewable energy market is facing changes, as early projects are soon due to lose their NFFO support. In addition, the recently elected Labour government has future plans of its own concerning the industry. This paper reviews the NFFO so far and speculates on the future of renewable energy. The article highlights the changes in the electricity industry, accepting the fact of pressures on electricity prices will continue. The author claims that the future of the renewables market lies in finding a path that takes the changing electrical market into consideration without damaging the expansion of the renewable energy industry.

### 97/04816 Renewable energy technologies in the Caribbean

Headley, O. *Solar Energy*, 1997, 59, (1-3), 1-9.

Renewable energy systems may be applicable to meet the energy demands of small island states, such as those that are already used in the island and coastal states of the Caribbean. It describes success stories, such as the 23,000 solar water heaters installed on homes in Barbados, and proposes ways of extending these to other areas of the economy where renewable energy has yet to make an impact. Solar crop dryers are used widely and windmills which were used to grind sugarcane for 300 years in some of the islands are now being revived for electricity generation and water pumping. In the hot and humid Caribbean, the major fraction of our electricity consumption is for refrigeration and air conditioning but solar cooling is rare. Solar thermally powered absorption cycles are inefficient, but it should be possible to operate hybrid systems where biomass fuel is used to supplement the heat from the solar collectors. This area will require a technological breakthrough before it becomes economic. In the meantime, photovoltaic (PV) systems are becoming cheaper and PV-powered vapour compression coolers may be the preferred technology of the immediate future. In isolated islands, it is necessary to consider the full environmental cost of any technology as these are often ignored in normal economic analyses when they recommend fossil fuelled systems.

### 97/04817 Using micro-hydropower in the Zairian village

Thornbloom, M. et al. *Solar Energy*, 1997, 59, (1-3), 75-81.

Village use of micro-hydro power is detailed using experience from Zaire. Site evaluation procedure, financing methods, turbine fabrication, and site construction are discussed. Micro-hydropower provides a decentralized energy source for several of the energy-intensive tasks of villagers. Low-head, small volume hydro potential is common in the Zairian countryside. Often a potential site also serves as the village water source, hence it is located near potential beneficiaries of the power. Over the past three decades, a religious NGO in the Ubangi and Mongala Sub-regions of Northwest Zaire has been developing this small hydro potential as part of its technology transfer and village development programme. Its construction used local materials and knowledge as much as possible. Experiences gained constructing a 370 kW hydro-electric site, as well as building water wheels for water pumping has led to the construction of micro-hydro sites using locally made cross-flow turbines. Four water wheel sites and six micro-hydro sites have been built. The hydropower is used to mill flour and hull coffee. One site also generates 220 V electricity, and 12 V generation is planned for two others.

## 08 STEAM RAISING

### Boiler Operation/Design

### 97/04818 The ABB LEBS system design

Ragan, J. W. et al. *Proc. Annu. Int. Pittsburgh Coal Conf.*, 1996, 13, (1), 137-144.

The US Department of Energy (DOE) aims in its 'Engineering Development of Advanced Coal-Fired Low-Emission Boiler Systems' (LEBS) project to effect dramatic improvement in the environmental performance of future pulverized coal-fired power plants. Its objectives include increasing their efficiency, and reducing their cost of electricity using near-term technologies, i.e. advanced technologies that are partially developed. The overall objective is to expedite commercialization of the developed technologies. The paper describes the work by the ABB team on the LEBS project, which is part of the DOE's Combustion 2000 Program. A major part of the Project is the design of a 400-MWe commercial generating unit (CGU), the design of which is projected to meet all the project objectives and to reduce emissions of NO<sub>x</sub>, SO<sub>2</sub>, and particulates from one-third to one-sixth of New Source Performance Standards limits, while increasing net station efficiency significantly and reducing the cost of electricity. Development activities supporting the design work are described in the paper.