What's happening in Task 31

December 2001

Welcome to the second issue of Task 31 News, prepared as we reach the end of the first year of IEA Bioenergy Task 31 'Conventional Forestry Systems for Sustainable Production of Bioenergy'.
Task 31 News is one of the vehicles we use for transfer of knowledge and information to our clients and stakeholders.

Some basic information about Task 31

Objective

to synthesize and transfer to stakeholders important knowledge and new technical information concerning conventional forestry systems for sustainable production of bioenergy.

Means we use to achieve the objective

sharing research results; stimulating new research directions in national programs of participating countries; technology transfer from science to resource managers, planners and industry.

Participating countries in 2001

Australia, Belgium, Canada, Denmark, Finland, Netherlands, New Zealand, Norway, Sweden, United Kingdom, United States.

Current Task 31 activities

Workshops and field study tours

A successful event with 31 participants was held in The Netherlands in September on the theme of 'Principles and practice of forestry and bioenergy in densely-populated regions'. Abstracts of some of the presentations appear in this issue of Task 31 News. Others will appear in the next issue. Complete proceedings of the workshop will be published in the international scientific journal 'Biomass and Bioenergy'.

A joint workshop with Task 30 'Short rotation crops for bioenergy systems' will be held in Brazil in 2002. See the first announcement and call for papers in this issue, as well as descriptions and photos of a couple of Brazilian bioenergy activities visited by Task leaders in 2001.

Industry days

A very successful day-long bioenergy seminar was held in Baarn, The Netherlands in September in conjunction with the Task workshop. This event brought together international experts associated with the Task and national personnel from forest industry and energy agencies to share knowledge and experience of issues and opportunities related to producing energy from forest residues.

Another Industry Day is planned for Belgium in June. Look out for announcements on the website **(www.ieabioenergy.com)** or locally through the Belgian National Team Leader, Jean-François Van Belle **(van_belle@cragx.fgov.be)**.

Book publication

The Task 18 synthesis publication 'Bioenergy from Sustainable Forestry: Guiding Principles and Practices' is finally nearing completion. It will be published by Kluwer Academic Publishers and should be available in the first quarter of 2002.

Electronic information system

Watch the Task 31 webpage, within the IEA Bioenergy website **(www.ieabioenergy.com)**, for expanded Task publication information, including resources such as photos, data and presentations.

Available now from Task 31

'Conventional Forestry Systems for Bioenergy: An Overview' - 12-page brochure describing the scientific and technical issues addressed by the Task. Available from Jim Richardson.

Task 31 poster - available in several sizes and electronic formats from Jim Richardson.

Proceedings of the Workshop 'Socio-economic aspects of bioenergy systems: Challenges and opportunities' organized jointly by Tasks 29 and 31 in Alberta, Canada in May 2001. Limited copies available from Jim Richardson.

Proceedings of the Workshop 'Bioenergy from sustainable forestry: principles and practices' organized by Task 31 in Australia in October 2000. Available from Alison Lowe, Task Secretary.

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Use of Forest Fuels increases rapidly in Finland

Finland has targeted large funding to research and development technologies for harvesting, transport and combustion of forest fuels. The first technology programme covered forest fuels and peat and now the ongoing National Wood Energy Technology Programme (1999-2003) focuses in wood-based fuels. Large forest companies and associated energy companies have invested heavily in solid fuel plants. As a result, use of forest fuels has tripled in four years.

In the 1980s domestic peat production had become competitive with imported fuels. The competitiveness was gained by intensive technology research and development programmes where both industries and research organisations worked in close cooperation. This successful model was then transferred to forest fuels. In the early 1990s Finnish energy authorities together with forest and energy companies decided to target long term funding for the development of new bioenergy technologies especially for the harvesting of forest fuels. The bioenergy technology programme (1993-1998) was successful. Its quantitative goals were reached and new harvesting technologies were taken into use.

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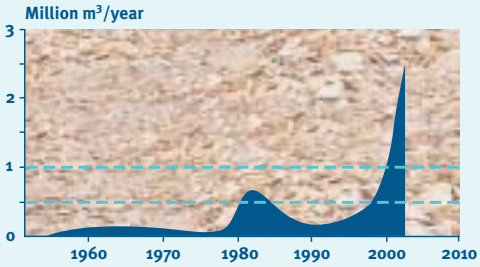

The National Wood Energy Technology Programme (1999-2003) focuses on developing the production technology and improving the quality of forest chips from logging residues and small sized trees. Estimated total funding for the programme is 42 M€.
The quantitative goal of the programme for forest chip use is 2.5 Mm^3/year by the year 2003. The program consists of research, development and demonstration projects. More information about the programme and projects is available at **http://akseli.tekes.fi/Resource.phx/enyr/puuenergia/en/index.htx.**

In 2000 the share of wood-based fuels for primary energy production reached 20%. The largest part of this figure is produced by industrial residues (black liquor, sawmill residues). An important fact, however, was that use of forest chips continued to grow fast.
In 2000 production of forest chips was 932,000 m^3 whereas at the beginning of the 1990s it was less than 200,000 m^3. It is foreseen that in 2001 more than 1 Mm^3 will be harvested (Graph Inset).

In Finland, the integration of wood fuel supply with the existing roundwood supply chain has been an issue especially for small diameter trees. More recently, harvesting and transport of logging residues has become easier to integrate with industrial roundwood. This has resulted from bundling techniques introduced in Sweden. Five Timberjack Fiberpac bundling units are currently in operation in Finland. The most recent innovation has been the integration of soil preparation with residue recovery. Scarification of soil takes place simultaneously with forwarding of residues. A prototype machine has been working for two summers in North Karelia (See Top Left). In average conditions, integration decreases the costs of scarification and residue recovery by about 10% compared with separate operations with two machines.

Pictured top left. Combi machine for soil scarification and forwarding of logging residues. Machine prototype is manufactured by Antti Varis Ky.

Pictured top right. Wood chips.

Graph Inset. Development of forest chip production in Finland.

Principles and Practice of Forestry and Bioenergy in Densely-Populated Regions

The following are edited abstracts of scientific and technical papers presented at the first workshop of IEA Bioenergy Task 31 held in Garderen, The Netherlands in September 2001. This is the first instalment, dealing with 'Forestry and Vegetation Management Challenges' and 'Forestry Operations and Bioenergy Options in the Urban-Wildland Interface'. More abstracts will appear in the next issue of Task 31 News. The complete papers will be published in a special issue of the journal Biomass and Bioenergy by the end of 2002.

Forestry and Vegetation Management Challenges

Nature-oriented forest management in Europe: re-allocating the production function across Europe

Gert Jan Nabuurs and Ad Olsthoorn, Alterra, The Netherlands

Both the forest area of European forests and the amount of wood available for harvesting are increasing. Still, severe conflicts have arisen over the use of this resource, between forest owners and processing industry, and nature conservation organisations. The latter, backed strongly by society, demand that forest management should be geared towards nature values. However this same society also consumes more and more wood products every year. A collaborative research project involving the European Forest Institute in Finland, and Alterra in The Netherlands aimed to quantify changes in forest management and to identify possibilities for forest management that aims at both nature and wood production. The study used the EFISCEN (European Forest Information Scenario) model in which forest inventory data of 30 European countries were incorporated. Model simulations led to estimates of future wood supply, biodiversity values, and sustainability level of European forest management at national and international scales. There has been considerable effort from forestry to develop forest residue harvesting. But forestry has also intensified energy recovery using 'secondary' forest fuel, the waste products from conventional forest industry.

Trends in forest management intensity in the northern forests of North America

F. Wayne Bell, Ontario Ministry of Natural Resources, Canada and Jim Richardson, IEA Bioenergy Task 31.

Two forest types, the boreal and Great Lakes – St. Lawrence (GLSL) forests, make up the northern forests of North America. Forest management within the boreal and GLSL forests, especially the former, is far less intensive than in equivalent European forests. Forest management in the boreal consists of about 35% natural disturbances (fire and insects), 33% extensive silviculture, 30% basic silviculture, and 2% intensive silviculture. Much of the GLSL forest has been converted to agriculture or urban centres, but in the remainder there is about 20% natural disturbance (ice storms and insects), 30% extensive silviculture, 35% basic silviculture, 12% intensive silviculture, and 3% elite silviculture. Management intensity (silvicultural and protection activities) in the northern forests is a function of land ownership, available labour forces, road access, distances to markets, tree species ecology, protection levels and global fibre supplies.

Double green energy from traditional coppice woodlands in The Netherlands

Patrick Jansen and Leen Kuiper, Institute of Forestry and Forest Products, Wageningen, The Netherlands.

Traditional coppice woodlands of oak, ash, alder and willow used to provide numerous useful products in the Netherlands, including bark for tanneries and firewood for bakeries. When these markets disappeared, most of the coppice stands were replaced by high forests or left to grow without a regular cutting cycle, at the cost of the specific natural values which coppice provides. The emerging renewable energy market could create a new outlet for the woody biomass from coppice. A project was set up to demonstrate the validity of a "double green" feedstock supply chain, including the harvest, logistics and delivery of coppice biomass to the power plant gate. "Double green" refers to the green energy generated and to the positive ecological effects when coppice management is restored to a regular cutting cycle. A new Dutch subsidy program makes it more appealing for forest owners to put their woodlands back into a coppice management regime. A number of practical problems related to mechanised harvesting still remain to be solved.

Mixed stands in Nordic countries: a challenge for the future

Tord Johansson, Swedish University of Agricultural Sciences

In the last fifteen years management and silviculture of mixed stands of conifers and broadleaves has increased rapidly in Nordic countries. The main focus at first was methods for reducing the cleaning costs in conifer plantings. But very soon it was obvious that efficient management of mixed stands could increase both profit for the owner and wood quality in the stand. Today there is practical experience on how to manage mixed stands of birch and Norway spruce. In Finland, Norway and Sweden this is a common alternative to managing pure

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stands of conifers. In Norway, there is also experience with mixed stands of European aspen and Norway spruce. However, there are few studies on yield and wood quality in mixed stands. Most broadleaved trees are cut for pulpwood. The highest wood quality trees are used for veneer or timber production. Depending on the biofuel price and market, the forest owner might use the broadleaves as biofuel. Recent studies on mixed stands of birch, aspen or alder and Norway spruce aim to increase the total yield of broadleaves per hectare. A mixture of conifers and broadleaves results in high wood quality for both species, with thin branches on the stem and few and small knots on the log.

Bioenergy and sustainable forest management in developing countries: the case of Morocco

Mohammed Ellatifi, Forest Service, Morocco

In developing countries, biomass plays an important role as an energy source. Around 90% of the world wood-energy production is in developing countries, where at least 75% of the population rely on forest wood as their primary source of energy. Traditional use of biomass is usually very inefficient in developing countries where fuelwood collection remains one of the major causes of deforestation. Carbon dioxide is released into the atmosphere by deforestation. On the other hand, tree planting permits the capture and storage of carbon, and the release of oxygen into the atmosphere. Consequently, in order to mitigate atmospheric CO_2 increase and other greenhouse gases, it is of paramount importance to halt deforestation, preserve and sustainably manage forests, reforest degraded lands, launch effective and large-scale programmes of biomass energy plantation, and develop sound energy-saving technologies and policies to improve the efficiency of biomass-burning appliances. This paper analyses the bioenergy situation in developing countries, taking Morocco as a case study. It also proposes some key steps to help preserve world forests, mitigate global warming, and promote economic and social development, particularly in developing countries.

Forestry Operations and Bioenergy Options in the Urban-Wildland Interface

Some aspects of requirements for technology and methods in urban forestry

Staffan Berg, SkogForsk, Sweden

The Swedish forest industry cluster can be regarded as an urban forestry system in the sense that it has to consider the vested interests of other parties including energy and other commodities as well as timber. The paper proposes a perspective, whereby the modern forest industry sector is regarded as a system for the production of energy carriers, and traditional forest industry products are a means for storage of bioenergy. Modern forest operations bring forward products with high efficiency in terms of invested energy and inherent energy in products. There are also markets, means and technology for the production of bioenergy carriers that involve an extended harvest of biomass. This harvest bears a cost that is economical and environmental. The markets for bioenergy seem to be growing and bioenergy from forests competes with other actors. It is a challenge for scientists and practitioners in the area to design systems that give a profitable flow of bioenergy from forestry without risking its sustainable use.

Systems analyses for harvesting of small trees for forest fuel in urban forestry

Rolf Björheden[1], Tomas Gullberg[1], Jerry Johansson[2], [1]Växjö University and [2]Dalarna College, Sweden

In urban areas, characterised by many small stands, harvesting systems using few machines are favourable. These areas, often used for recreation, also benefit from harvesting with limited damage to ground and trees, and short intensive harvesting phases with less disturbance. Slash-free, “clean” stands after harvesting are better suited for recreational activities. Forest fuel harvesting can provide these conditions. The paper describes a study analysing economic consequences of simulated harvesting of forest fuel in selected stand types. The harvested trees in these types of stands may yield large quantities of biomass. However, if only pulpwood is removed in small dimension stands, only a small portion of the potential biomass is utilised and the net value is lowest of all the analysed stand types. Forest fuel systems including motor-manual felling and manual bunching give the best results in the smallest diameter stands. Simulated systems including one single machine felling/chipping/extracting as well as a machine felling/bundling plus forwarding, also show net revenue at small tree sizes. Both are suitable for larger tree sizes than

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the manual method. The conventional method for pulpwood harvest shows the poorest result, but may be competitive to the poorest forest-fuel systems from an average diameter of 10 cm in the removal.

Multi-level strategy for power plant supply with urban forest residues

JF Van Belle, CRA, Belgium

Wallonia (southern Belgium) has 5/6 of the 600,000 ha of Belgian forests. Species include beech, oak, Norway spruce, Scots pine, and Douglas-fir, and total annual harvest is 4,000,000 m^3. In order to comply with Kyoto protocol targets, the national power utility wishes to tap the renewable resource of forest residues to feed its old coal-fired power plants. A study was carried out to evaluate quantitatively, qualitatively and geographically the forest residue resource, and to determine the best strategy to feed two coal-fired power plants taking into account technical, economic and social aspects. Techno-economic models were built for each supply system and linked to the regional forest inventory through a geographic information system. This led to a 3-level strategy using a highly productive system for base supply, a medium capital-intensive system for co-supply, and a labour-intensive channel for the peak electricity needs. Final cost of feedstock ranged from 4.12 EURO/GJ to 120.5 EURO/GJ.

Flagstaff's wildfire fuels treatments: prescriptions for community involvement and a source of bioenergy

Allen Farnsworth, Paul Summerfelt and Daniel G. Neary, US Forest Service, Arizona, USA

Flagstaff is a high-elevation metropolitan area in Arizona surrounded by a dense ponderosa pine forest with a high annual number of wildland fire starts in and adjacent to the urban area. Wildfire is the main fire threat to the community. National Forest and city fire managers in the Flagstaff Wildland-Urban Interface have developed a system of socially-welcomed fuel reduction harvesting treatments which have proven effective in reducing wildfire hazard, in improving probability for successful initial attack on wildfires, maintaining and enhancing vegetative diversity, in initiating improvement of overall forest health, and in providing a local source of bioenergy. The long-term objective of the program is to facilitate socially acceptable stewardship of forested properties within the interface, regardless of ownership or jurisdiction. The program incorporates not only forestry and fire science but also community and neighborhood input as vital components in successfully developing, implementing, and maintaining the treatments.

Potential costs of four silvicultural regimes used for the production of energy

Pablo Faúndez E, Santiago, Chile

Four cultivation regimes representing different intensities of forestry in central Chile for the production of biomass for energy, using Populus, Salix, Pinus and Eucalyptus, are selected and their potential costs compared. Costs related to cultivation, harvest and soil use are included. Sensitivity analysis is done to obtain the minimum cost of energy stored in the biomass. Costs of producing energy using the selected regimes for Pinus and Eucalyptus are comparable to those for oil and natural gas. In this study, extensive energy forestry (Pinus and Eucalyptus) is associated with lower costs per unit of energy than for intensive energy forestry (Salix and Populus).

Biomass fuel use in the homesteads of Chittagong Region, Bangladesh

Md. Danesh Miah, Romel Ahmed and Mohammad Belal Uddin, University of Chittagong, Bangladesh

An exploratory survey was carried out to assess the biomass fuel use in the homesteads of Chittagong region, Bangladesh. A multistage random sampling technique was adopted to perform the study. Based on the monthly income, respondents were categorized into rich, medium and poor and a total of 45 homesteads, 15 from each category were selected randomly for the study. The study revealed that stems, branches, leaves of trees and agricultural residues were the biomass fuel used by the respondents. Market, homestead, agricultural field, secondary forests/plantation were the sources of biomass fuel identified. Male and female were identified as the major collector of fuelwood from the nearby forests/plantations and homesteads respectively. Six fuelwood species were identified as the most preferred in the study area. The study identified the rainy season as the woodfuel shortage period spanning between May and August.

Pictured above from left to right.

Motor-manual felling of Douglas fir thinnings, Veluwe, The Netherlands.

Urban forest, Arnhem, The Netherlands.

Sawmill log storage, Cuijk, The Netherlands (this is apparently the second largest sawmill in Western Europe).

Mechanical extraction of Douglas fir thinnings, Veluwe, The Netherlands.

Bioenergy in Brazil

Brazil is a very large country - the 5th largest in the world in terms of both area (8,547,404 km^2) and population (166,113,000 - 2000 estimate). It contains what is estimated to be the second largest city in the world (after Bombay, India) - Sao Paulo, with a population of 9,391,000. Brazil has long been considered a pioneer and significant example in its use of bioenergy, primarily for the extensive use of ethanol produced from sugar cane bagasse as a transportation fuel in place of petroleum products. Leaders of IEA Bioenergy Task 31, together with leaders of Task 30 'Short rotation crops for bioenergy systems', visited Brazil recently with the objectives of (a) learning about the current status of biomass production and use for energy in that country, (b) encouraging Brazil to participate actively in the two Tasks, and (c) exploring the possibility of organizing a joint Task workshop in Brazil in 2002. In a 10-day visit, only a small sample of the enormous ecological and economic diversity of the country could be seen, but sufficient to indicate the strong level and variety of bioenergy activity and the remarkable biomass productivity of Brazil.

There are about 400 million ha of native forests in Brazil. Historically the Amazon rain forest covered more than 50% of the country but now covers only 36%. Other important forest types include the Atlantic forest in the south-east, which has been reduced from 12% of Brazil to only 1%, the Araucaria forest in the south, now occupying less than 500 km^2, and the Cerrado savanna of low-density forest which covers much of the interior (12% of the country) and is the location for most of the eucalypt culture.
There are now more than 6 million ha of plantations in Brazil, including 2.9 million ha of eucalypts and 1.7 million ha of pines. These plantations produce about 100 million m^3 of wood annually, a significant part of the annual wood consumption of 282 million m^3.
The forest sector has annual revenues of US$ 16.5 billion and US$ 3.5 billion of forest products are exported annually. Most of the wood consumption (78%) is related directly or indirectly to energy use. Domestic wood use accounts for 33% of consumption, 25% is used in charcoal production for cement, iron, steel and zinc production, 19% is direct energy use, and 1.2% is used in drying processes. The pulp and paper industry alone uses 5.8 million m^3 of wood annually for energy production.
The productivity of Brazilian plantations is truly remarkable. Eucalypts produce 30-50 m^3/ha/year and are typically grown on a 7-year coppice rotation with up to 3 rotations on the same root systems. Pines produce between 20 and 30 m^3/ha/year, with rotations of 12 years if no thinning is employed or 25 years with 2 or more intermediate thinnings.

V&M Florestal is a forest management company operating in the State of Minas Gerais in the central savanna zone. Its stated objectives are ecological preservation and the production of charcoal for use in the iron and steel smelting processes of its parent company V&M Tubes. V&M Florestal manages 230,000 ha of forest, including 170,000 ha of eucalypt plantations, and produces 1.2 million m^3 of charcoal annually which meets almost all the parent company's charcoal needs.

Eucalypts were first planted in Brazil (outside of botanical gardens) in the early part of the 20th century, but the present scale of eucalypt plantations is of much more recent origin. Starting in 1984 V&M Florestal brought material of 41 Eucalyptus species to Brazil from Australia. The number of species has been reduced to 6 together with a number of hybrids and clonal propagation is now the rule.
The preferred hybrid is Eucalyptus camaldulensis - urophylla which combines good productivity with drought tolerance and resistance to insect pests. The normal productivity is 24 m^3/ha/year but the best clones produce almost 80 m^3/ha/year.
An intensive early selection and testing process is used to continuously improve the clonal material. However, the best clones in the first plantation rotation are normally also the best in the second rotation. Micropropagation techniques are used to produce plantlets in laboratory conditions which are subsequently transplanted in the nursery before being planted out in the forest. Different clones respond differently to plantation

spacing, but 3 m - 3 m spacing is now the standard. The best clones respond best to wider spacing and on dry sites, high density stands are not possible.

Site preparation for planting emphasizes soil and water conservation. Low impact equipment is used and the level of cultivation is reduced from previous years. The objectives are to control weed competition and loosen the soil. Plantation management includes fertilization, weed control and control of ants and defoliating caterpillars. The typical cerrado land has very low soil organic matter content (1-2%) as well as very low levels of phosphorus (P), typically 1.4-2.8 ppm. P is added at the rate of 11 kg/ha of 6-30-6 fertilizer. There is no response to nitrogen (N) fertilization except on sandy sites and N cycling is considered good. Boron (B) deficiency, which can cause dieback, is countered by applying 20g of borax three months after planting in three applications of 2g B/seedling. This produces a 60% increase in productivity. The impoverished cerrado soils are improved by the eucalypt plantations and there is considerable carbon sequestration. Biological control of insect pests is used successfully.

Government regulations require the company to preserve and manage native flora and fauna within the exotic species plantations. 'Preservation strips' of planted native tree species 500 m apart and 25 m wide are established within the plantation areas and these provide habitat for small mammals, native bees and birds. The native strips have been found to reduce ant populations in the eucalypt plantations.

Harvesting is the most expensive part of the plantation management. It is not highly mechanized as in Europe or North America: with labour being cheap and jobs important, 80% of logging is by hand; slashers and feller-bunchers account for only 15% of production. One reason for the low level of mechanization is that there is no forestry equipment manufacture in Brazil. However, efforts are being made to improve productivity.

The forest operations of V&M Florestal have been certified by the Forest Stewardship Council and under the ISO 14001 scheme. Certification has placed some limitations on techniques used previously. Branches and leaves are not removed from cutting areas so that the soil remains covered. Skidders are no longer used because of environmental damage. Trucks have been found to cause some soil compaction in the wet season, as well as some damage to coppicing, but the latter does not reduce productivity.

Charcoal production takes place in centralized installations of brick kilns (pictured). These are filled by hand, but the carbonization process which converts the wood into charcoal has been intensively studied and optimized. The fresh wood is stored in the field for 90 days to reduce the moisture content from 100 to 30%. By storing it for 120 days, the moisture content could be reduced to 20% but this is not considered economic. The carbonization process takes 5 days in the kilns, but by adding water extracted from the wood, the subsequent cooling period has been reduced from 12 days to 6 days. The aim is for a charcoal yield of 40-41%. Although the conventional charcoal production is a batch process, efforts are being made to develop an efficient continuous carbonization kiln. Other investigations include recovery of tar from the process and the possibility of burning the tar as a fuel and in the carbonization process.

At the other end of the range of biomass production technologies is the bracatinga system, a traditional cultivation system for producing traditional fuelwood. Bracatinga is based on the use of Mimosa scabrella, a small- to medium-sized, fast growing but short-lived tree of southern Brazil, particularly the State of Paraná where it has been cultivated for fuelwood since the early 20th century. It is grown in traditional forestry cultivation systems or traditional agroforestry systems, including a type of taungya in which M. scabrella, which is a nitrogen-fixing species, alternates with corn and beans. The traditional systems have high initial densities, little or no tending and no addition of fertilizers. These traditional systems cover about 70,000 ha around the city of Curitiba and are a significant source of domestic fuelwood in the area. Other products from the bracatinga system include charcoal, building construction materials, especially forms for concrete, and leaves for forage. The trees flower in winter and so are an important winter forage for bees and honey production.

The trees are grown on a rotation of 7-8 years and produce about 12.5 m^3/ha/year. M. scabrella regenerates profusely from seed after disturbance, particularly fire, and so prescribed fire may be a part of the traditional cultivation system. The typical bracatinga application in agroforestry involves growing the trees on a 6-year rotation in coffee plantations to provide shade and protection against frost. In general, bracatinga is a low intensity type of agriculture: it requires little or no human intervention. Nor is it intensive forestry. However, it does serve to maintain rural life and productivity, while providing a significant source of fuelwood.

Some of the key current issues and trends related to bioenergy in Brazil include:

Sustainability

The forest operations of most major forest industries operating in Brazil have been certified as sustainable under FSC or other schemes. An important condition for certification is the establishment and maintenance of areas of native forest species. This is not the conservation of natural forest areas as understood in North America, for example, but the re-establishment of a semi-natural forest condition on areas which have been deforested, in some cases many years previously.

Ethanol production and use

The previous widespread production and use of ethanol from bagasse as a gasoline substitute was dependent on government support, which was largely withdrawn in a period of deregulation in the early 1990s. Thus, ethanol as a motor fuel, although still widely available at service stations, is no longer as widely used.

Electric power production

Electricity production in Brazil is largely dependent (90%) on hydro installations, since Brazil has few oil and coal resources. A recent prolonged drought caused major power shortages, and the introduction of electricity use restrictions. One result is a renewed interest in alternative energy sources, including biomass.

A joint workshop of Tasks 31 and 30 will be held in Brazil in 2002. See the first announcement elsewhere in this issue of Task 31 News, and watch the website, **(www.ieabioenergy.com)** for further information on this event.

Jim Richardson, Task 31 Leader

Pictured Left. Fuelwood for domestic use produced from traditional bracatinga system, Paraná photo courtesy of Jim Richardson.

Pictured top right. Kilns for production of charcoal from Eucalyptus wood for iron smelting, V&M Florestal, Minas Gerais.

Strategies to Develop Sustainable Bioenergy Production Systems

IEA Bioenergy

Task 30 - Short Rotation Crops for Bioenergy Systems, and Task 31 - Conventional Forestry Systems for Sustainable Production of Bioenergy and SIF (Brazilian Forest Research Society)

JOINT WORKSHOP

Belo Horizonte Minas Gerais State, Brazil 28 Oct - 1 Nov, 2002

Organised by Laercio Couto, Research Director, SIF. **Contact: Laercio Couto; lcouto@ufv.br**

Workshop Objectives

The objective of the workshop is (a) to examine existing bioenergy production systems with a view to assessing their economic, social and environmental sustainability, and identifying the criteria that help to ensure their sustainability; and (b) to share information about the characteristics of viable, practical strategies for developing and implementing sustainable bioenergy production systems. This objective will be pursued in two main topic areas addressing a series of basic questions:

Global and local bioenergy resource assessment • Sustainable bioenergy production systems Strategies to achieve potential site productivity • Strategies to sustain on and off-site environmental quality • Strategies to optimize economic efficiency of bioenergy systems • Strategies to realize socio-economic benefits of bioenergy systems.

Call for Posters and Papers

Scientific and technical papers and posters addressing any of the workshop topics are invited. Please email Titles, authors, authors affiliations and abstracts by 31 March 2002 to Jim Richardson (jrichardson@on.aibn.com).

Programme

Optional Post-Workshop Tour — Friday 25 October

Energy generation from sugar cane in São Paulo State.

Cultural tours can be arranged for the weekend of Oct 26-27.

Arrival — Sunday 27 October

Arrive at either Confins (Tancredo Neves) international airport (1 hour from Belo Horizonte), or Pampulha domestic airport (15-20 minutes from hotel), and make your way to the Grandarrel Minas Hotel in Belo Horizonte, where workshop sessions will take place.

Field Study Tour — Monday 28 October

Field trip to see Eucalyptus plantations, charcoal, and tar production from eucalyptus at V & M.

Bioenergy Seminar — Tuesday 29 October

Technology transfer event involving exchange of information and ideas on bioenergy issues between Brazilian and international participants.

Technical Sessions — Wednesday 30 October - Friday 1 November

Optional Post-Workshop Tour — Saturday 2 Nov - Tuesday 5 Nov

Eucalypt plantations, industries and the use of biomass of eucalypts for energy generation in Espirito Santo State.

Cost

The workshop registration fee will be approximately $US250 This will cover all workshop costs but not accommodation or meals, which will be very reasonably priced. Additional costs will apply separately for both pre-workshop and post-workshop tours.

Accommodation and workshop sessions are at the Grandarrel Minas Hotel in the centre of Belo Horizonte (901 Espirito Santo Street) in a very safe area. Hotel rates range from about $US44 for a single/standard room with breakfast to about $US114 for a double/superior room with all meals, at present exchange rates.

Information

Further information about any aspect of the workshop or field tours may be obtained on the Task 31 webpages at www.ieabioenergy.com (look under 'Our Work - Tasks' for 'Task 31') or by contacting the Task 31 Secretary Alison Lowe at alison.lowe@forestresearch.co.nz.

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