**IEA Bioenergy**

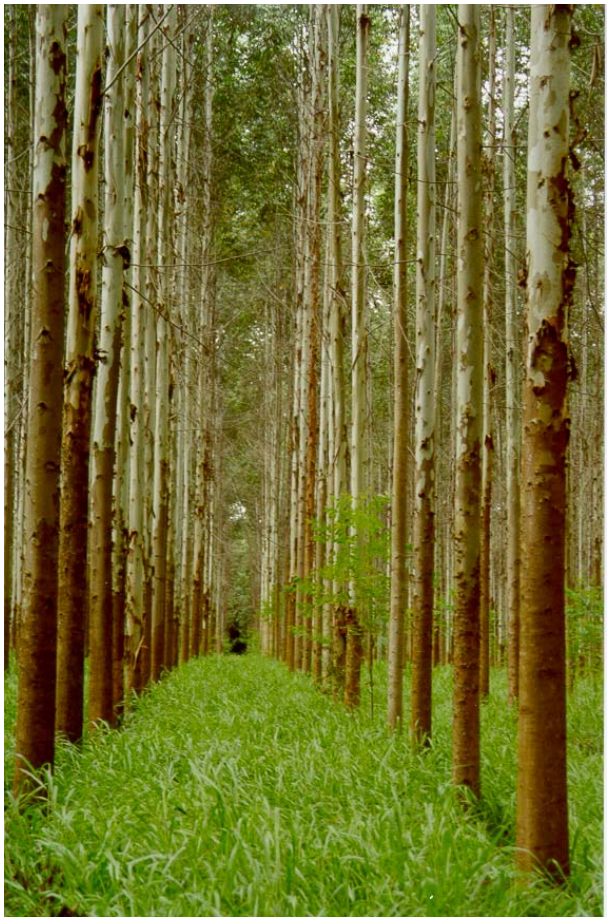
*Task 30 - Short Rotation Crops for Bioenergy Systems, and*

*Task 31 - Conventional Forestry Systems for Sustainable Production of Bioenergy*

SOCIETY OF FOREST RESEARCH

*With assistance from the FAO Wood Energy Program*

# REGISTRATION & FINAL CALL FOR PAPERS



International Workshop

## *Sustainable Bioenergy Production Systems: Environmental, Operational and Social Implications*

**Belo Horizonte, Brazil**
Oct 28 – Nov 1 2002

***and optional***
**Pre-Workshop Tour** Oct 25
**Post-Workshop Tour** Nov 4

*PHOTO: LAÉRCIO COUTO*

Organised by Laércio Couto, Research Director, SIF, Viçosa, M.G., Brazil; lcouto@ufv.br
IEA Bioenergy Task 31 Leader, Jim Richardson; jrichardson@on.aibn.com
IEA Bioenergy Task 30 Leader, Theo Verwijst; theo.verwijst@lto.slu.se
IEA Bioenergy Webpage; http://www.ieabioenergy.com

## BACKGROUND

This workshop brings together SIF and other Brazilian partners with FAO Wood Energy Program and two IEA Bioenergy Tasks, Task 30 'Short Rotation Crops for Bioenergy Systems' and Task 31 'Conventional Forestry Systems for Sustainable Production of Bioenergy'.

The objective of Task 30 is to meet the needs of bioenergy industries through technical improvement of biomass crop production technologies, through documenting and disseminating information on the potential environmental benefits of biomass crop production systems, and through developing information to enhance market development in collaboration with the private sector. The overall aim of the Task is to further develop short rotation biomass production systems, improve the awareness of the bioenergy production potential, and promote the use of biomass for energy in participating countries.

The objective of Task 31 is to synthesize and transfer to stakeholders, important knowledge and new technical information concerning conventional forestry systems for sustainable production of bioenergy. The technical focus is on three distinct aspects of biomass production: the management of forest stands and plantations; the recovery of biomass for energy through forest operations; and questions of environmental, economic and social sustainability of biofuel production. The Task encompasses natural forestry systems and single-stem plantation systems that can provide a source of biomass for energy.

Founded in 1974, the Society for Forest Research (SIF) is a non-profit organization, a combined enterprise and university institution, aiming at the development of the Brazilian forest sector. This joint research effort comprises several forest companies under the leadership of the Department of Forestry of the Federal University of Viçosa (UFV) in Minas Gerais, Brazil. The goal of SIF is to promote high quality technological development using the resources of UFV, of the forest companies and other organizations to the benefit of society.

## WORKSHOP OBJECTIVES

The objectives are: (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. *How adequate are existing systems for assessing global and local biomass resources? Are sufficient agricultural and forest resources - land, genetic base, physiological capability - available to meet bioenergy goals? What is the nature of global and local markets for bioenergy at present and how are they responding to technical and policy changes?*
- Sustainable bioenergy production systems.
    - Potential site productivity. *What are the limitations to strategies for genetic and crop improvement? How can factors affecting site quality, including nutrients, water and pests (weeds, diseases, insects, animals) be managed sustainably?*
    - Environmental quality. *What are the environmental impacts of intensive management systems and how can they be minimized? What are the criteria of sustainable environmental management systems and how can they best be characterized? What is the role of adaptive management strategies?*
    - Operations and economic efficiency. *What are the characteristics of efficient supply chains - from harvesting to combustion - for biofuels from intensive plantation management systems? What are the recent developments in efficient technology? Can life cycle analysis and other tools for evaluation improve the sustainability of supply chains?*
    - Strategies to realize socio-economic benefits of bioenergy systems. *What are the social benefits, particularly for rural communities, of increased use of bioenergy on a local and regional level and how can they be optimized?*

# DRAFT PROGRAMME

***OPTIONAL PRE-WORKSHOP ENERGY AND CULTURAL TOURS***

Arrival in São Paulo City. Accommodation at Itaim Meliá Hotel, São Paulo City. *Thu October 24*

**Energy generation from sugar cane in São Paulo State**. ***Fri October 25***
Drive by bus to Piracicaba (Bairro Costa Pinto), 180 km from Sao Paulo city in the morning. Visit COSAN in the afternoon to see all aspects and stages of sugar and alcohol production. Return to Melia Hotel, São Paulo City around 8pm.
*Hosted by Denise Rodrigues of UNICA (unica@unica.com.br)*

Fly from São Paulo State to Pampulha domestic airport, which is 15-20 minutes from the Grandarrel Minas Hotel in Belo Horizonte, the venue for the workshop sessions and accommodation. The other option is to fly to Confins (Tancredo Neves) international airport, but this is 1 hour from Belo Horizonte. *Sat October 26*

**Cultural tours from Belo Horizonte will be available for those who wish**: ***Sun October 27***

A. Gruta do Maquine and Rei do Mato (caves);
B. Ouro Preto City (dramatically-situated historic gold-mining town, said to be one of the loveliest towns in Brazil).

*NOTE: All accommodation, as well as transportation from São Paulo State to Pampulha airport, Belo Horizonte, is to be arranged and paid for by participants (through Elloturismo- see booking form).*

***ARRIVAL FOR WORKSHOP*** ***Sun October 27***

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, the venue for the workshop sessions and accommodation. **Registration** for most international participants will take place at the Grandarrel Minas Hotel Sunday evening.

***FIELD STUDY TOUR*** ***Mon October 28***

Field trip to see Eucalyptus plantations, charcoal, and tar production from eucalyptus at V & M (maximum 40 persons).

08:00 Depart by bus from Belo Horizonte to Paraopeba (about 1.5 hours drive)
09:30 Meet V & M staff, initial presentation, CAPEF video about the company
10:30 Visit labs at CAPEF (the research center of V & M)
11:00 Visit the charcoal and wooden tar production site
11:30 Visit eucalypt plantations
12.30 Lunch at the Lagoa Dourada
15:30 Depart for Belo Horizonte
17:00 Arrive at Belo Horizonte

The **welcoming reception** will take place at the hotel this evening. The cost is included in the registration fee and there is no charge for accompanying persons. **Registration** for most Brazilian participants will take place this evening.

***BIOENERGY SEMINAR*** ***Tue October 29***

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

## '**Biomass Energy from Forestry: issues and opportunities**'

**Grandarrel Minas Hotel, Belo Horizonte**

08:15 Welcome and Introduction - *Jim Richardson, IEA Task 31; Theo Verwijst, IEA Task 30*

08:30 Opening Address - *Antônio Carlos Tatit Holtz, Brazilian Secretary of Energy*

09:00 Native forest management in Brazil – *Alcir Ribeiro Carneiro de Almeida, Cikel BrasilVerde S.A*

09:30 Forest plantations in Brazil with opportunities for biomass energy - *Sergio Luiz Toninello, ABRACAVE*

10:00 Biomass energy in Brazil: a general overview - *Isaias de Carvalho Macedo, UNICAMP*

10:30 Coffee Break

11:00 Aspects of forest biomass production for energy: the case of V&M - *Antônio Claret de Oliveira, V & M*

11:30 Aspects of forest biomass production for energy: Combined cycle perspective - *Daltro Garcia Pinatti, DEMAR-FAENQUIL*

12:00 Lunch

13:30 Sustainable biomass production for energy from conventional forestry systems – *Jim Richardson, IEA Bioenergy Task 31*

14:00 Sustainable biomass production for energy from short rotation forestry systems – *Theo Verwijst, Swedish University of Agricultural Sciences*

14:30 Coffee Break

15:00 Scandinavian harvesting systems for bioenergy – *Rolf Björheden, Växjö University, Sweden*

15:30 Environmental consequences of harvesting wood for energy – *Tat Smith, Texas A&M University, USA*

16:00 Business opportunities for biomass under the Clean Development Mechanism – *Semida Silveira, Swedish Energy Agency*

16:30 Distributed generation of electricity using small cogeneration plants based on biomass – *José Henriques Diniz, CEMIG*

17:00 End of Seminar

| *INTERNATIONAL WORKSHOP TECHNICAL SESSIONS* | *Wed October 30 – Fri November 1* |
|---|---|

*NOTE: The program for the technical sessions is tentative. The final allocation of papers to oral and poster sessions will be made after all volunteer paper offers have been received, and the final schedule to be distributed in mid-September. Scientific and technical papers addressing any of the workshop topics are invited.* ***Please email Titles, authors, authors affiliations and abstracts by August 30, 2002 to Jim Richardson*** *(jrichardson@on.aibn.com), and please indicate whether you prefer to give an oral presentation or a poster. Those who have already submitted abstracts in response to the first announcement of the workshop do not need to resubmit. All abstracts that are received* ***by August 30,*** *and are accepted, will be included in the program material provided to participants at the workshop. The technical sessions are likely to run from 08:30 to 17:00. Task 30 and 31 business meetings will take place during these days or evenings at times to be determined.*

## Session 1. Global and local bioenergy resource assessment. Technical co-chair: *André Faaij*.

*Invited and volunteer papers and discussion. How adequate are existing systems for assessing global and local biomass resources? Are sufficient agricultural and forest resources - land, genetic base, physiological capability - available to meet bioenergy goals? What is the nature of global and local markets for bioenergy at present and how are they responding to technical and policy changes?*

Overview of Global-scale Resource Assessment

- *André Faaij, STS, Utrecht University, The Netherlands*.
- *FAO* - Forest Resource Assessment 2000.
- *Gunther Fischer, IIASA*.

National-level Resource Assessment studies

Regional-level Resource Assessment studies

- *Auke Koopmans* - Regional Wood Energy Development Program of FAO.
- *FAO* - Woodfuel Sustainability Maps.
- *Inge Stupak Møller & Christian Nørgaard Nielsen, Denmark* - Biomass equations for Norway spruce (Picea abies (L.) Karst.) in Denmark.

## Session 2. Sustainable bioenergy production systems: Potential site productivity.

**Technical co-chairs:** ***Ian Nicholas, Nick Comerford and Don McGuire.***

*Invited and volunteer papers and discussion. What are the limitations to strategies for genetic and crop improvement? How can factors affecting site quality, including nutrients, water and pests (weeds, diseases, insects, animals) be managed sustainably?*

- *Nairam Felix de Barros and Roberto Novais, Universidade Federal de Viçosa, Brazil* - Eucalyptus nutrition management for sustainable production: modeling and existing databases on which the model is based.
- *Júlio Neves, Universidade Federal de Viçosa, Brazil* - Nutritional and water aspects to clonal plantation management of Eucalyptus.
- *Nairam Barros Filho, N.B. Comerford, and Nairam F. Barros, University of Florida, USA* - P Sorption, Desorption and Resorption in Brazilian Oxisols: P Bioavailability to Eucalyptus.
- *Donald Mead, New Zealand* - Opportunities for improving plantation productivity. How much? How quickly? How realistic?
- *Ian Nicholas, Errol Hay and Mark Kimberley, Forest Research, NZ* - The interaction of climate, soil nutrition, tree health and tree stocking on stand productivity of selected eucalypt species in NZ.
- *Don McGuire, Forestry SA, Australia* - Tree and stand biomass estimation using a tariff approach.
- *T.G. Baker and J.D. Morris, Australia* - Development of the 3PG Forest Growth Model to predict growth, water use, nutrient sequestration and soil salt accumulation in wastewater-irrigated bioenergy tree crops.
- *Dan Wildy, University of Western Australia* - Management of mallee eucalypts for production of bioenergy in the semi-arid wheatbelt of Western Australia.
- *T.M. Williams, C.A. Gresham, Baruch Institute of Coastal Ecology and Forest Science, USA* - Crown structure of six-year-old loblolly pine (Pinus taeda L) grown without limits to water or nutrients.
- *W.W. Wilhelm, Jane Johnson, J.L. Hatfield, Ward Voorhees, D.R. Linden, USDA-ARS, and J.S. Schepers, US Dept. of Agriculture* - Crop and soil productivity implications of corn stover removal for use as a biofuel feedstock.

**Session 3. Sustainable bioenergy production systems: Environmental quality.**
**Technical co-chair: *J.G. Isebrands.***
*Invited and volunteer papers and discussion. What are the environmental impacts of intensive management systems and how can they be minimized? What are the criteria of sustainable environmental management systems and how can they best be characterized? What is the role of adaptive management strategies?*

- *L. Licht, USA* - Linking phytoremediation applications with bioenergy.
- *J.G. Isebrands, USA* - Riparian tree buffer strip applications in the US.
- *Helena Mälkki, VTT Processes, Finland* - Application of life cycle assessment in characterising sustainable wood energy production system.
- *Geraldo Moura Alves, Plantar, Brazil* - Carbon sequestration in the production of pig iron using biomass and charcoal.
- *João Azevedo, Texas A&M University, USA* - Sustainability of forested landscapes in East Texas: Approach and methods.
- *Inge Stupak Møller, Danish Forest and Landscape Research Institute* - The influence of harvesting intensity on the size of nutrient removals in early thinnings of Norway spruce.
- *Inge Stupak Møller[1] and Staffan Jacobson[2], [1]Danish Forest and Landscape Research Institute and [2]SkogForsk, Sweden* - EXCEL user programs for synthesis and dissemination of knowledge: nutrient removals, nutrient balances, soil acidification and wood ash recycling when utilising forest biomass for energy.
- *Karsten Raulund Rasmussen[1], Erik Karltun[2], Antti Asikainen[3], Anders Lunnan[4], Remigijus Ozolincius[5], Talis Gaitnieks[6], Malle Mandre[7] & Inge Stupak Møller[1], [1]Denmark, [2]Sweden, [3]Finland, [4]Norway, [5]Lithuania, [6]Latvia, [7]Estonia* – 'Wood for Energy': A contribution to the development of sustainable forest management. A new European project.
- *Daniel G. Neary, USDA Forest Service* - A comparison of the impacts of conventional rotation forestry, short rotation tree crops, and agriculture on water resources.

**Session 4. Sustainable bioenergy production systems: Operations and economic efficiency.**
**Technical co-chair: *Antti Asikainen.***
*Invited and volunteer papers and discussion. What are the characteristics of efficient supply chains - from harvesting to combustion - for biofuels from intensive plantation management systems? What are the recent developments in efficient technology? Can life cycle analysis and other tools for evaluation improve the sustainability of supply chains?*

- *Rolf Björheden, Växjö University, Sweden* - Design of efficient felling equipment for energy harvesting.
- *Juha Nurmi, Finnish Forest Research Institute* - Bunch-delimbing of small-sized whole trees.
- *Juha Laitila & Antti Asikainen, Finnish Forest Research Institute* - Residue recovery and site preparation in a single operation in regeneration areas.
- *Simen Gjøsljø, Norwegian Forest Research Institute* - Cost of transporting forest residues to Gardermoen heating plant.
- *Tapio Ranta, VTT Processes, Finland* - Use of GIS for forest fuel availability and cost comparison of procurement systems.
- *Antti Asikainen & Mikko Lehikoinen, Finland* - Mobile technology and internet-based solutions for forest fuel transport management.
- *Raida Jirjis, Swedish University of Agricultural Sciences* - Changes in fuel quality of short rotation forestry during storage.

**Session 5. Sustainable bioenergy production systems: Strategies to realize socio-economic benefits of bioenergy systems. Technical co-chair: *Bengt Hillring*.**
*Invited and volunteer papers and discussion. What are the social benefits, particularly for rural communities, of increased use of bioenergy on a local and regional level and how can they be optimized?*

- *Bengt Hillring, Swedish University of Agricultural Sciences* - Experiences from 20 years of rural development and bioenergy in Sweden.
- *(FAO)*
- *Erik Skärbäck, Department of Landscape Planning, SLU* - Energy forests for more than energy.

| ***OPTIONAL POST-WORKSHOP TOUR*** | |
|---|---|
| Travel from Belo Horizonte to Vitoria, Espirito Santo State | *Sat November 2* |
| Cultural tours can also be arranged | *Sun November 3* |
| **Aracruz eucalypt plantations and nursery. T**ravel by bus to Aracruz to visit the plant, the eucalypt plantations and the nursery. Return to Vitoria in the evening. | ***Mon November 4*** |
| Departure from Vitoria, Espirito Santo State.<br>*NOTE: All accommodation, as well as transportation Belo Horizonte to Vitoria, Espirito Santo State, is to be arranged and paid for by participants (through Elloturismo- see booking form).* | *Tue November 5* |

## VENUE & ACCOMMODATION

The Grandarrel Minas Hotel in the centre of Belo Horizonte will provide the venue and accommodation for the workshop. Arrange your own accommodation bookings with Fabricia from Elloturismo ***(fabricia@elloturismo.com.br)***, as she has arranged a reduced rate for the participants of the workshop, using the 'Accommodation and optional tours booking form'. Also a reminder that the responsibility for visas and health precautions rests with the individual.

**During optional pre-workshop tour São Paulo State and cultural tours**
Itaim Meliá Hotel, Rua Manoel Guedes 320, Itaim Bibi, São Paulo City
*Book for nights October 24, 25 (Saturday October 26 will be in Belo Horizonte below)*

**During main workshop (field study tour, bioenergy seminar, technical sessions)**
Grandarrel Minas Hotel
901 Espirito Santo Street
Belo Horizonte
Fax:+55 31 3248-1100
Email: reserv@grandarrel.com.br
*Book for nights Saturday October 26 – Friday November 1 inclusive*

**During optional post-workshop tour**
Vitoria, Espirito Santo State
*Book for nights Saturday November 2 – Monday November 5 inclusive*

## FEES*

***MAIN WORKSHOP (FIELD STUDY TOUR, BIOENERGY SEMINAR, TECHNICAL SESSIONS)***

| | |
|---|---|
| Registration fee covers workshop materials, venue, welcoming reception, transportation for the field tour, translation for technical sessions (Portuguese-English and English-Portuguese). The fee excludes accommodation, meals and drinks. There will be no registration fee for partners accompanying participants if they only join in social activities. | US$250 |

***OPTIONAL PRE- AND POST-WORKSHOP TOURS*****

| | |
|---|---|
| Energy from sugar cane. | US$25 |
| Gruta do Maquine and Rei do Mato (caves). | US$40 |
| Ouro Preto city. | US$30 |
| Aracruz eucalypt plantations and nursery. | US$25 |

* ***Participants are responsible for booking and payment for their accommodation, and also for travel*** *between pre- main- and post-workshop venues Hotel rates range from about $US50 for a single/standard room with breakfast to about $US110 for a double/superior room (including breakfast), at present exchange rates (See accommodation and optional tours booking form)*

** *Fees for optional tours cover transportation and lunch (without drinks)*

# FINAL 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 August 30, 2002 to Jim Richardson** (jrichardson@on.aibn.com). Those who have already submitted abstracts in response to the first announcement of the workshop do not need to resubmit. All abstracts that are received **by August 30,** and are accepted, will be included in the program material provided to participants at the workshop.

# INSTRUCTIONS TO PRESENTERS/AUTHORS

### *PRESENTATIONS*

There will tentatively be 45 minutes allocated (30 talk plus 15 questions/discussion) for invited presentations, and 30 minutes (20 minutes talk plus 10 questions/discussion) for volunteer papers. Simultaneous interpretation (Portuguese-English and English-Portuguese) of all oral presentations will be provided, using microphones and headsets. Slide and Powerpoint presentation equipment will be available for oral presentations. Detailed instructions regarding delivery of PowerPoint files to ensure smooth presentation and avoid electronic hitches will be provided to oral presenters once the technical program has been finalized in mid-September.

Poster boards of size 1 x 2 meters will be available for your use. Printing and copying facilities will be available during the workshop.

### *MANUSCRIPTS*

Biomass & Bioenergy have agreed in principle to publish the workshop proceedings. Manuscripts will be refereed, generally by others who attend the workshop. Full papers written in English, from both oral and poster presentations will be considered for inclusion in the proceedings, i.e. slide decks will not be included. It is imperative that you follow the "Guide for Authors" as closely as possible in formatting your manuscript. From the home-page (www.elsevier.com/locate/biombioe) click on the Author Gateway (under Authors), and then "Guide for Authors," under the heading Submission Information. Please submit a single hardcopy and an electronic version of final paper to Alison Lowe either: at the workshop; by post (Forest Research, Private Bag 3020 Rotorua New Zealand); or email (alison.lowe@forestresearch.co.nz). **Papers will be accepted until November 15 2002.**

# MAIN WORKSHOP REGISTRATION

*IEA BIOENERGY WORKSHOP, TASKS 30 AND 31; SOCIETY FOR FOREST RESEARCH (SIF)*

# *Sustainable Bioenergy Production Systems:*
## *Environmental, Operational and Social Implications*

Belo Horizonte, Brazil. October 28 - November 1, 2002
Pre-Workshop Tour, October 25; Post-Workshop Tour, November 4

## PERSONAL DETAILS

First Name: _____ Family name: _____

(Partner's Name) _____ (Partner's Family name): _____

Affiliation: _____

Address: _____

_____

_____

Phone: _____ Fax: _____

E-mail: _____

_____

*(Please indicate above if you have any special requirements regarding meals or access)*

| ARRIVAL | |
|---|---|
| Date: | |
| Flight No.: | |
| Time: | |

| DEPARTURE | |
|---|---|
| Date: | |
| Flight No.: | |
| Time: | |

## REGISTRATION FEE FOR MAIN WORKSHOP

☐ **US$250** Main workshop fee includes field tour, bioenergy seminar, technical sessions. Excludes accommodation and optional tours - see 'Accommodation and Optional Tours' booking form

## PAYMENT

☐ Please debit my VISA / AMERICAN EXPRESS *(delete one)* credit card for the amount **US$250**

Name on card _____ Account number _____

Expiry date _____ Signature _____

☐ I deposited **US$250** on _____ (*date*) to: SIF BIOENERGY **5758-4** *(account),* Campus UFV Viçosa MG **0428-6** ***(branch)***, Bank of Brazil **001** *(country).* Participants are to state their name and their company name with the transaction.

## Please return form with payment by 15 SEPTEMBER to:

**Tatiana Crespo**
Society of Forest Research (SIF)
Viçosa M.G.
BRAZIL

Phone: +55 31 38 99 2476
Fax: +55 31 38 91 2166
Email: sif@ufv.br

# ACCOMMODATION & OPTIONAL TOURS

*IEA BIOENERGY WORKSHOP, TASKS 30 AND 31; SOCIETY FOR FOREST RESEARCH (SIF)*

# *Sustainable Bioenergy Production Systems:*
## *Environmental, Operational and Social Implications*

### PERSONAL DETAILS

First Name: _____ Family name: _____

Affiliation: _____

City/Country: _____

Phone: _____ Fax: _____

E-mail: _____

_____

*(Please indicate above if you have any special requirements regarding access etc)*

***Please book the following accommodation and optional tours for me. I will pay for these in Brazil, but I have provided my credit card details below in the case of no show:***

VISA / AMERICAN EXPRESS *(delete one)* credit card

Name on card _____ Account number _____

Expiry date _____ Signature _____

### ACCOMMODATION (dates inclusive)

- ☐ Thu October 24 and Fri October 25 at Itaim Meliá Hotel in São Paulo City
- ☐ Sat October 26 at Grandarrel Minas Hotel in Belo Horizonte
- ☐ Sun October 27 – Fri November 1 at Grandarrel Minas Hotel in Belo Horizonte
- ☐ Sat November 2 – Tue November 5 at a hotel in Vitoria, Espirito Santo State
- ☐ Additional

### OPTIONAL TOURS & TRAVEL BETWEEN

- ☐ Optional pre-workshop tour ‘Energy from sugar cane’ (US$25); Friday Oct 25
- ☐ Flight from São Paulo State to Pampulha domestic airport; Saturday Oct 26
- ☐ Optional cultural tour ‘Gruta do Maquine and Rei do Mato (caves)’ (US$40); Sunday Oct 27
- ☐ Optional cultural tour ‘Ouro Preto city’ (US$30); Sunday Oct 27
- ☐ Flight from Belo Horizonte to Vitoria, Espirito Santo State; Saturday Nov 2
- ☐ I may be interested in an organised cultural tour on Sunday Nov 3
- ☐ Optional tour ‘Aracruz eucalypt plantations and nursery’ (US$25); Monday Nov 4

**Please email this form by 15 SEPTEMBER to**

**Fabricia from Elloturismo (fabricia@elloturismo.com.br)**