

BIOENERGY

NO 3 MAY 2010



The World Bioenergy Award: Presentation of the main nominees

World Bioenergy
Association two years old!

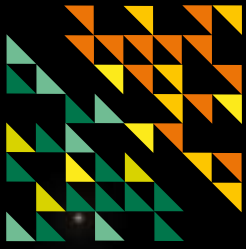
The global potential of sustainable
bioenergy is enough to meet the
world's total energy needs



The gender perspective
of bioenergy policy in
Africa

BioenergyConnect –
committed to promoting
bioenergy across the globe





WORLD BIOENERGY 2012

Conference & Exhibition on Biomass for Energy

29 - 31 MAY 2012, JÖNKÖPING - SWEDEN

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World Bioenergy Association – two years old in May

WE CELEBRATE OUR BIRTHDAY with a reception on 25 May, at the World Bioenergy 2010, Elmia, Jönköping. Welcome everybody!

These two years have been very busy:

1. WBA has initiated three reports made by a research team at the Swedish University of Agricultural Sciences on biomass for energy. The first report is about the global potential. The second is about the competition with food and feed, water supply and land use. And the last report is on sustainability criteria, where we define sustainability as in the Brundtland Report: “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of ‘needs’, in particular the essential needs of the world’s poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment’s ability to meet present and future needs.”

You will find more information about the reports in this magazine.

2. WBA has been recognised as the global association representing biomass for energy by the International Renewable Energy Alliance (REN Alliance). We are now one of the five members together with the International Geothermal Association, the International Hydropower Association, the International Solar Energy Society and the World Wind Energy Association. REN Alliance represents the renewable industry and researchers and has now an agreement on cooperation with the International Renewable Energy Agency (IRENA), which is an intergovernmental organisation that represents the politicians.

At COP 15, in Copenhagen in December 2009, WBA had a joint exhibition stand and a press conference together with REN Alliance’s members. WBA also had the opportunity to present the reports mentioned above in a TV interview.

3. WBA and the organisers of World Bioenergy 2010 are now introducing the World Bioenergy Award. The aim of this award is to recognize the important work done by a person within the bioenergy industry. The response has been above our expectations and we are proud to introduce the winner at World Bioenergy 2010, in Jönköping on 25 May!

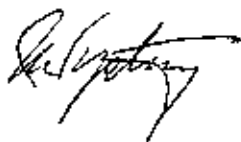
YOU CAN FIND MORE INFORMATION about what has happened during 2009 in the annual reports “Letter from the president”.

TODAY WE HAVE ABOUT 40 MEMBERS, a number we hope to see grow substantially in the near future. Without members we can’t finance our activities. And without a large number of members, who do we represent? One of our most important tasks for attracting new members is to launch BioenergyConnect, a global marketplace and networking centre for companies, researchers and others. We would have done so a long time ago if we had been able to find financing for such a platform. We are now working intensively on just that.

As we clearly see an increasing demand for renewable energy and as the bioenergy sector can offer a mature and economically attractive technology, I am convinced that WBA has a very prosperous future.

So, all bioenergy friends, join WBA and keep on with your efforts!

Yours sincerely,



Kent Nyström
President, World Bioenergy Association



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On 16 - 17 March 2010 around 2,300 delegates gathered in Älvsjö outside of Stockholm for the Energitinget ('Energy Sessions') to discuss recent developments in the energy sector. The World Bioenergy Association (WBA) held a session called "Global Potential for Bioenergy Sufficient to meet the Total Energy Demand".

By Rodrigo Ceciliano, World Bioenergy Association

WBA's report shows: The global potential of sustainable bioenergy is enough to meet the world's total energy needs

One of the issues discussed was the conflict between bioenergy and food production, in which many claim that increased use of biofuels causes increased food shortages. Johan Vinterbäck from the Swedish University of Agricultural Sciences presented results of research on the subject, explaining that an unequal distribution of resources is the main contributing factor to the problem. Kent Nyström and Karin Haara, WBA's chair and executive director, respectively, agreed with the findings.

Nyström stated that the sustainable production of energy from biomass can create opportunities for many countries. Building a market for bioenergy often provides benefits to the agricultural products market as well. For example, if the production of crops for energy requires an irrigation system in order to maintain production, that same system can be used to help increase food production. Therefore, the need for bioenergy can be the factor which contributes to increased food production. In general, a political framework is also required that allows for the necessary investments and infrastructure.

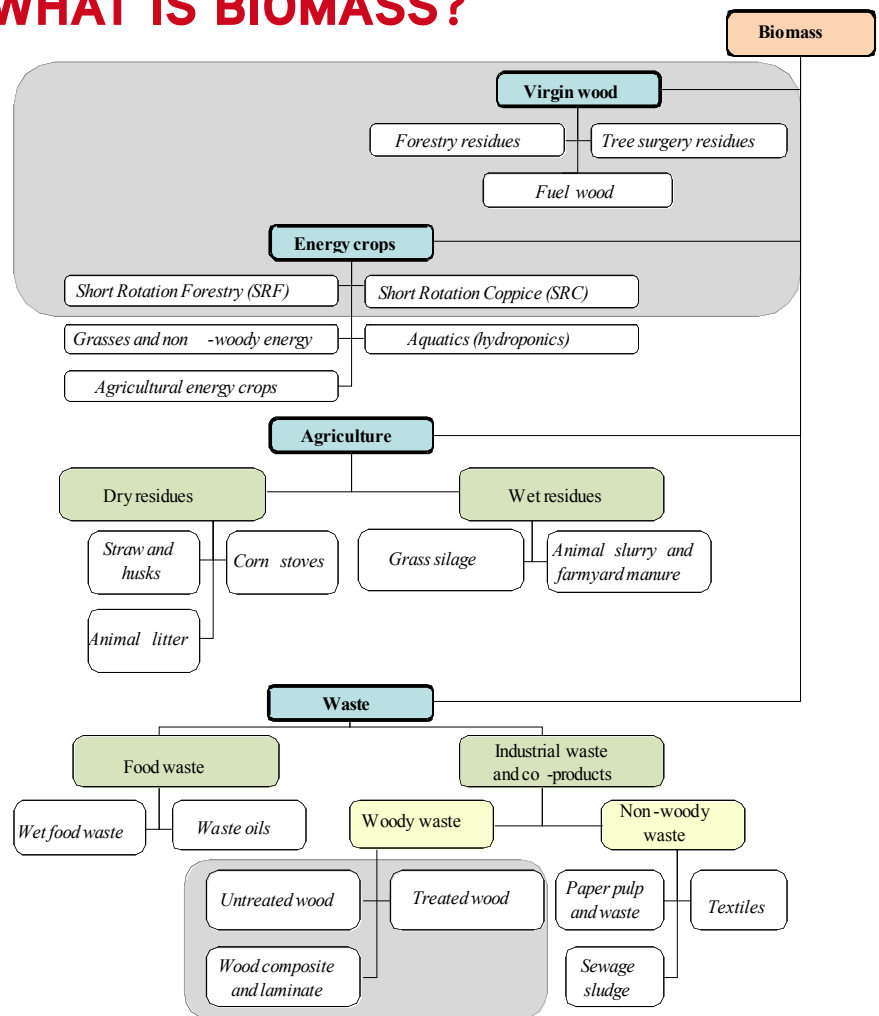
Sustainability criteria

Haara said that the criteria for sustainability must be developed in order to guarantee sustainability for energy from biomass. At the meeting, a set of certification criteria for sustainable bioenergy consisting of 23 points was presented. More information on this proposal will be available on www.worldbioenergy.org.

Lessons learned and future plans

Representatives from China, the United States, Brazil and Kenya told of their experi-

WHAT IS BIOMASS?

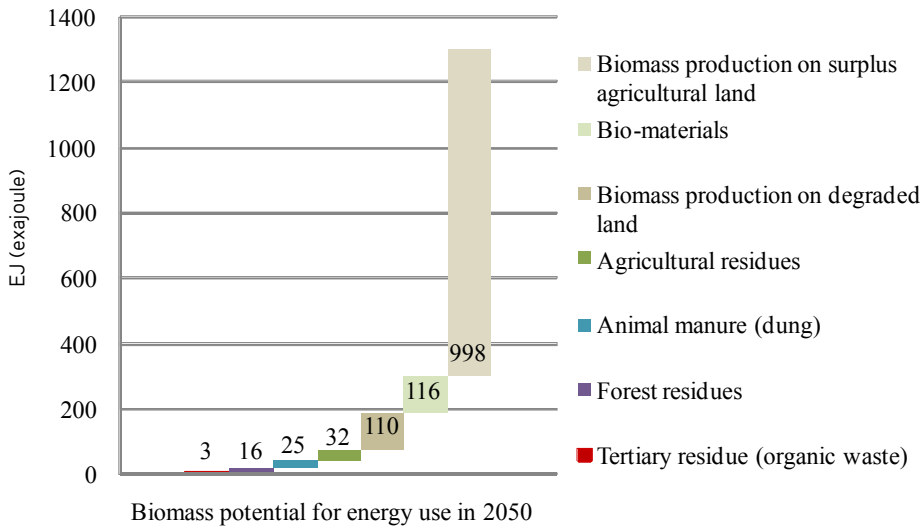


Classification of sources of biomass for production of energy.

Note: Biomass from woody materials are in the shaded areas.

Source: S. Ladanai, J. Vinterbäck, Global Potential of Sustainable Biomass for Energy, Report 013, ISSN 1654-9406, Uppsala 2009, Swedish University of Agricultural Sciences

WHERE?



Contribution of each biomass resource category to the global potential of biomass for energy use in 2050. (Source: Hoogwijk et al, 2003).

Note: The biomass resource categories are distinguished to assess the theoretically available potential of biomass for energy use.

Source: S. Ladanai, J. Vinterbäck, Global Potential of Sustainable Biomass for Energy, Report 013, ISSN 1654-9406, Uppsala 2009, Swedish University of Agricultural Sciences

ences within the field of bioenergy. China's ambassador to Sweden, Chen Mingming, explained that the government is increasing its investments in bioenergy. China's goal is to have 15 percent of its total energy use come from renewable sources by 2020, with 4 percent coming from bioenergy. China sees Sweden as a credible partner in this area.

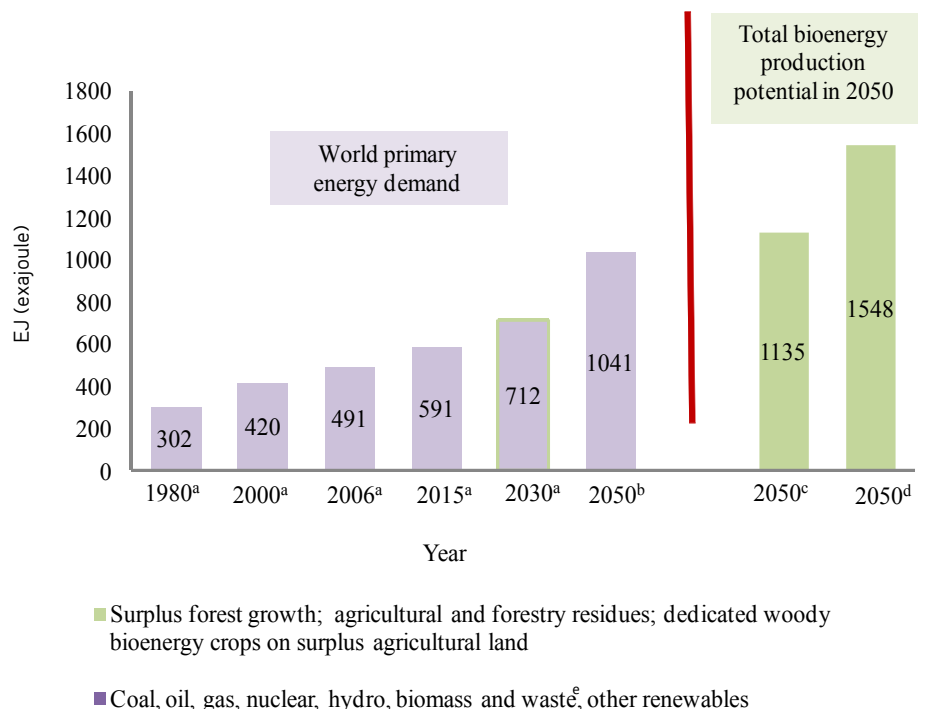
The economic and environmental attaché from the US embassy, Laura Kirkconell, said that her country aims to become one of the most important players in the bioenergy field. President Barack Obama has decided to prioritize bioenergy and adapt it to the US economy. As a result, there is now much talk in the United States about the green economy.

Rodrigo Almeida, energy attaché from the embassy of Brazil, expressed his happiness with the results of his country's efforts within bioenergy. The sector has helped stabilize the Brazilian economy, in addition to making Brazilians more aware of the country's resources and its strength in the world.

Kenya's representative, Benard Muok, a project leader at the African Center for Technology Studies (ACTS), relayed an overarching view from Africa that industrialized countries must also adapt their knowledge, technologies, foreign aid, investments, and regulations to African conditions. It's important that the advantages derived from producing energy crops are also distributed to the local populations - something which rarely happens today.

In conclusion, we stand before great challenges within the bioenergy sector. The World Bioenergy Association can play a role by distributing information about the world's large potential for sustainable bioenergy.

HOW MUCH?



World primary energy demand for years 1980, 2000, 2006 and forecasts for years 2015, 2030 and 2050 and estimates for total global bioenergy production potentials in 2050. Total energy use versus total bioenergy maximum potential in 2050. Due to IEA 57% of the demand in 2050 is met by increased energy efficiency!

Notes: a) IEA, 2008 b) Highest consumption scenario (Smeets et al., 2004)

c) Based on an upper limit of the amount of biomass that can come available as (primary) energy supply without affecting the supply for food crops (Hoogwijk et al., 2003) d) Based on scenario 4 in the source, where a type of agricultural management applied is similar to the best available technology in the industrialized regions (Smeets et al., 2006) e) Includes traditional and modern uses.

Source: S. Ladanai, J. Vinterbäck, Global Potential of Sustainable Biomass for Energy, Report 013, ISSN 1654-9406, Uppsala 2009, Swedish University of Agricultural Sciences

The first World Bioenergy Award – presentation of the nominees

World Bioenergy 2010 together with the World Bioenergy Association are proud to introduce the World Bioenergy Award. The aim of the award is to recognize the efforts made by a person who has made a difference that has furthered the development of the bioenergy sector. Bioenergy asked the nominees some questions to get their personal views regarding bioenergy. Here you have their answers:



The announcement of the award resulted in 90 nominations from all continents representing 19 different countries. The nominations represented a broad range of professional areas. It has not been easy for the jury to pick out the winner since every proposal received important arguments to support the nomination. The jury consisted of World Bioenergy Association's Board and organisers of World Bioenergy 2010. After a voting process seven of the nominees stood out as the main nominees for the award. The winner will be announced on 25 May in the opening plenary session of World Bioenergy 2010.

PENTTI HAKKILA, FORMER METLA, FINLAND

What has been the most exciting issue working with biomass for your personal life and professional experience?

In the 1950's and 1960's it became evident that the welfare and economy of the humankind are too tightly based on exhausting resources. Eyes were gradually turned to renewable sources of materials and energy. The use of wood was still limited mainly to the stem, or actually only to its best part meeting given quality and dimensional requirements of the industry or private consumers, whereas other parts of the tree were left unutilized. In the traditional forestry and forest inventories they were hardly recognized at all.

When the Nordic Council started to support joint Nordic forest research at the end of the 1960's, one of the few topics accepted in the program was the utilization of forest residues. Since practically nothing was known about the potential and utilization of the forgotten tree components such as crown mass and stump-root systems, we decided to create a holistic research program including inventorying of the quantity, composition and technical properties of all the unutilized tree components, technology for recovering and processing them to products, and impacts of intensive biomass recovery on the forests and soil.

In retrospect, the most important and exciting part of the work was proving the huge potential and the possibility to harvest almost any fraction of the above- and below-ground forest biomass in the form of chips at a cost which could become reasonable in foreseeable future.

Biomass measurements had earlier been of interest to ecologists only, whereas studies headed for large-scale utilization were



Pentti Hakkila is a pioneer in bioenergy research from Metla, a Finnish forest research institute.

something new. Our primary interest was originally to supply the pulp and paper industries with additional fiber, but quite soon the emphasis was shifted to energy and biochemicals.

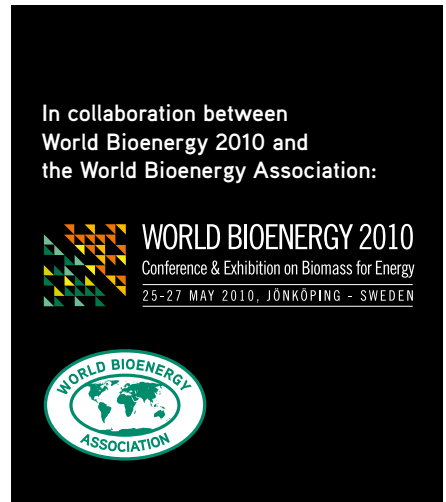
“Since practically nothing was known about the potential and utilization of the forgotten tree components such as crown mass and stump-root systems, we decided to create a holistic research program.”

Consequently, mass rather than volume now became the most appealing unit to quantify the forest biomass. The vision was that today's residual can be made into tomorrow's furnish.

In the beginning, the biomass research was considered by many to be of academic



Ralph Sims has been working with research and development in different areas in the bioenergy sector.



interest only, and few scientists, mainly in the Nordic countries and North America, were involved. But when the potential was proved and recognized, more and more scientists, institutes, national and international organizations and countries joined. A decisive step was taken and the development was speeded up greatly, when credible information about this attractive resource and about the potential of modern forest technology to recover a larger part of it provoked the interest of the industries. Finally, the change of global climate awakened the interest of policy makers around the world, and this is where we are now.

According to your work and experience how do you see the future for bioenergy sector?

Bioenergy is one of the primary corner stones in the global efforts to replace fossil fuels with renewables. The goals set for using bioenergy are in many countries very ambitious. Still, there is pressure towards even higher goals, and it is very difficult to replace biomass with other renewable sources in order to produce heat, electricity, biofuels or other biochemicals.

From the point of forestry, in the long run the problem will not be demand but availability. This will give a positive impact to forestry and the forest sector as a whole

What and which areas do you think should be developed in short and long terms?

It is good to remember that during the past four decades many unexpected changes of course have taken place in the goals of biomass utilization and in the preferred technologies of harvesting and processing. I would be very surprised if this doesn't happen again.

To meet the goals set, development of ef-

ficient technology and systems for biomass recovery from all possible sources, and technologies for processing biomass to improved and high-value products, continues to be of utmost importance.

RALPH E. H. SIMS, CENTRE FOR ENERGY RESEARCH MASSEY UNIVERSITY, NEW ZEALAND

What has been the most exciting issue working with biomass for your personal life and professional experience?

From originally researching biodiesel in the 1970's, running a series of short rotation coppice trials in the 1980's, publishing my first book "The Brilliance of Bioenergy" in 2002, to working on several key bioenergy reports on heating, biofuels and biomass sustainability guidelines whilst recently working at the IEA, Paris, this question is difficult to answer. But in terms of "excitement" it was probably getting a Ford 5000 tractor to run successfully on 100% animal fat in 1974.

According to your work and experience how do you see the future for the bioenergy sector?

There is no doubt bioenergy will have a growing contribution to make to the low carbon energy supply systems, but we all have to ensure that the industry remains "smart" when dealing with the controversial issues of sustainable biomass resources, land use and water competition and land ownership. Determining the "best" use of biomass for any given location is key to the successful future of the industry.

What and which areas do you think should be developed in short and long terms?

Other than the sustainable issues mentioned above, and developing indicators to measure them, careful analysis is needed to identify the social benefits and disbenefits from the proposed development of a bioenergy project in order to minimise any possible negative social impacts as well as environmental ones. In addition the transition from the inefficient use of traditional biomass in rural areas of developing countries to more healthy, affordable and efficient provision of energy services has to be addressed more seriously than at present.

Would you like to add something?

Looking back over my 35 years working on renewable energy, on bioenergy in particular, we have come a long way in many respects. But much more R&D is yet to be undertaken to gain the desired rapid deployment of projects and funding remains inadequate. The bioenergy sector has some excellent researchers and industry organizations; IEA Bioenergy has done an excellent job in encouraging international collaboration over the past three decades; the World Bioenergy and other conferences have done a great job in aiding networking and communication. Yet whereas the general public understand

"I am not convinced the bioenergy industry has done enough to promote a positive image in many countries around the world. This could be the next challenge."

wind power and solar water heating, I am not convinced the bioenergy industry has done enough to promote a positive image in many countries around the world. This could be the next challenge.



Bernt Svensén is promoting transport systems based on methane.

BERNT SVENSÉN, BUSINESS REGION GÖTEBORG, SWEDEN

What has been the most exciting issue working with biomass for your personal life and professional experience?

For me, the most exciting issue is the development within the vehicle manufactory industries working with biofuels. I've been working very close to some of these companies regarding use of biogas in the vehicles. I have initiated two co-operation projects to promote new methane-diesel-engine technique in heavy duty trucks. The vehicles use 70 % biogas and 30 % biodiesel in a very energy efficient way. This is a real breakthrough and there is a worldwide potential for these vehicles, but also for the supplying systems, production, distribution, etc.

According to your work and experience how do you see the future for the bioenergy sector?

There is a big potential for bioenergy in the future and one big sector is biofuel for transports, which I think is going to grow a lot.

“There is a worldwide potential for these vehicles, but also for the supplying systems, production, distribution, etc.”

The thermal gasification technology is coming very soon. The results from the research gasifier at Chalmers University of Technology show that it might be possible to use the concept and technique on existing fluid bed bio plants. We are going to see more biocombines delivering electricity, heat/cooling and biofuels. Also the refineries and petrochemical industries are going to use renewables and biomass in a larger scale.

What and which areas do you think should be developed in short and long terms?

In the short term I think we have to develop

more sustainable systems for bioenergy. To develop systems for biofuels and food production with synergy effects is very important. For example crops can be used in rotation systems as fertilizer, and also for producing biogas. The rest products from the digestion can be used as a bio fertilizer, replacing commercial fertilizers. Algae is interesting in the long term.



D.R. Ranade has developed systems to generate biogas from a variety of biomass.

D. R. RANADE, AGHARKAR RESEARCH INSTITUTE, INDIA

Exciting issues

After completing my post-graduation, in 1975, I received fellowship at Agharkar Research Institute (ARI, then MACS Research institute), Pune, India. Shortly afterwards the Government of India, realizing the importance of bioenergy, provided subsidy to farmers to construct biogas plants to promote the use of biogas as a cooking fuel. This gave impetus to research and development activities in the renewable and sustainable energy sector.

I realized that microbiological research on biogas production was totally neglected at that time. Since I did my post-graduation in Microbiology I got interested in microbiological aspects of biogas production with special reference to methane producing bacteria/ methanogens.

The isolation and identification of methanogens present in cattle waste based biogas plant was the most exciting issue while working with bioenergy. Subsequently I got an opportunity for post-doctoral research on methanogens and methanogenesis in France. On my return I continued with my interest in R&D on bioenergy, particularly

on biogas production from biomass.

In 1985 UNESCO awarded me “the young scientist award” for contribution in New and Renewable Energy Sources”. This was another milestone in my R&D career.

Through lab research we succeeded in developing an efficient process which we termed as “3EBT (Efficient, Ecofriendly, Economical BioTechnology) Process for production of biogas from de-oiled castor cake”. In our process we could produce around 350 L biogas per kg biomass per day having ca. 75% (v/v) methane. Then we transferred this know-how to an industry M/s Ashsih Cans and Containers Private Limited, Talegoan, Pune, India. The Company could replace nearly 200 L diesel per day which it was using for the burner. The conversion of lab research into full-scale biogas plant at the industry and saving in commercial fuel due to use of biogas was an exciting professional achievement. Similar success was achieved with de-oiled cake of *Pongamia indica*, food waste/kitchen waste, antibiotic mycelial waste, etc.

Future for Bioenergy Sector

The bioenergy sector is predominantly referred to utilization of biomass. This biomass is used to generate energy through gasification or to generate biogas. The fermentation processes to produce liquid fuel in form of bioalcohol, biobutanol and gaseous fuel in form of biohydrogen are now being developed and tried in industries.

We have recently isolated an anaerobic bacterial culture producing 3.5 mmoles of biohydrogen per mmoles of glucose used. This yield is ca. 85 % of the theoretical yield. Using such cultures it should be possible to develop commercial processes for biohydrogen production and use such hydrogen in fuel cells.

Another facet of bioenergy is the use of microbial cultures in oil and gas recovery. We have recently developed a process for microbially enhanced recovery of oil at high temperature of 95° C. Similarly, our efforts are now aimed at converting heavy/ residual oil - which presently remains in the sediment - to methane. These processes would be technologies of the future for energy generation.

I envisage a very large number of biogas plants coming up in India and other Asian, African and Latin American countries owing to rich agricultural production. Use of biogas technology to produce gaseous fuel from all available biomass and organic waste becomes very important for the developing countries. The process has double benefit of producing biofuel and generating organically rich manure for farming. High-rate anaerobic processes will be in demand. After the purification of biogas by removal of carbon dioxide the biogas may become a very important source of vehicle fuel.

“The use of biogas technology to produce gaseous fuel from all available biomass and organic waste becomes very important for the developing countries.”



Harry Stokes has seen that a good cooking stove can change the whole life for a family in Africa.



John Swaan has developed a new industry in Canada.

Short- and long-term areas to be developed

In the short-term a large number of processes would be developed to utilize a wide variety of biomass to generate biogas.

In the long-term, these processes would be up-scaled to benefit the end-users, viz. rural areas, industries, and domestic-fuel requirements.

Futuristic research

To develop transgenic methanogens having ability to produce methane from cellulose, starch, etc. Such bacteria would be useful as a pure culture system to produce methane from biomass. This would offer better control on the process with increased efficiency.

**HARRY STOKES,
PROJECT GAIA INC. AND
GAIA ASSOCIATION, USA**

What has been the most exciting issue working with biomass for your personal life and professional experience?

My greatest pleasure has been to see the impact a simple stove can have on the life of a woman, and by extension, her children and her entire family. Having a safe, fast-cooking stove that uses a clean, modern fuel—for example bioethanol—changes her whole life. She does not have to spend dozens of hours per week gathering fuel. She does not have to carry heavy burdens. Because she no longer has to go out to gather, she does not risk assault, rape or injury. She is healthier and breathes more easily. And she has time for herself and her children. A good stove makes a profound difference in a life. It is something we take for granted in the more developed world.

According to your work and experience how do you see the future for the bioenergy sector?

The bioenergy sector has an enormous future, and we need to embrace and develop

it now—because the future is now. This sector is of growing importance in Europe and of growing urgency in North America, but it is a matter of life or death for many of the poorest countries of the world, whether in Africa or elsewhere, where there is extreme energy poverty.

These nations are bankrupting themselves

“Since cooking represents 70 to 90% of the total energy demand in most poor countries, we need to give priority to developing clean liquid biofuels for cooking.”

by importing expensive petroleum fuels. They are further impoverishing themselves by mining their standing biomass and destroying their environment. Yet they could be producing all of the energy they need from sustainable agriculture, which would also enable them to rebuild the soil, revitalize their domestic markets and their economy, and resupply their larders. I think of Haiti as a case in point. Its future is in its agriculture - not only for food but also for fuel.

What and which areas do you think should be developed in short and long terms?

Since cooking represents 70 to 90% of the total energy demand in most poor countries, we need to give priority to developing clean liquid biofuels for cooking. This also helps the rest of the world, since cooking fires in the South are a major contributor to the causes of climate change, including black carbon deposition on our glaciers and ice caps. After we solve the problem of cooking, we can also provide for other needs in the household, such as refrigeration, likewise powered with clean, liquid biofuels.

Would you like to add something?

As we focus on biofuels for our developed

economies, let us also consider the importance of assisting less developed economies to make the switch to sustainably produced and used biofuels. Why is it that poor economies use wood fuels unsustainably? It is because they do not have the time to invest in 30-year crops. Therefore, let us encourage and assist in the switch from wood fuels to agricultural crops that are harvested several times each year and able to be replanted or repropagated for the next.

**JOHN SWAAN,
MAGNOLIA BIOENERGY LLC,
CANADA**

What has been the most exciting issue working with biomass for your personal life and professional experience?

Personally - It is very gratifying to be involved in the bioenergy industry, an industry that most North American's have never heard of. The word "bioenergy" or the concept of the positive impact this developing industry would have on benefiting the environment, economy and energy resource sustainability was unknown. It's also very humbling to be recognized for having made a contribution in the development of the bioenergy industry. I believe that one should 'never give up on your Dreams and Visions - surround yourself with good people and be good to them and then all goals are possible.' Professionally - Taking pride in developing, what was in Canada, a new industry and helping move that industry forward. Dem-

“Biomass, when refined (densified), will transport and provide bioenergy resources globally.”

onstrating to the world that biomass, when refined (densified), will transport and provide bioenergy resources globally.

According to your work and experience how do you see the future for the bioenergy sector?

I foresee the future of the bioenergy industry continue to provide "Sustainable Renewable Energy" as an alternative for fossil fuels like coal, oil and gas. Densified bioenergy fuels such as wood pellets will see a 10 fold increase in production globally within the next 10 - 15 years. We'll also see a new generation of wood pellets which incorporate processes such as the "torrefaction" of the biomass to increase the calorific value and become hydrophobic.

What and which areas do you think should be developed in short and long terms?

Short term - Complete the development of the ISO Standard for Solid BioEnergy Resources and the ISO Standard for BioEnergy Sustainability Criteria which will enable the development of a strategy to encourage implementation worldwide. Long term - Stop and Go environmental policy's discourage investment. All BioEnergy Industry community stakeholders should be encouraged to support initiatives which advance the development of environmental policies that reflect transparency of all costs for fossil fuel production as well as fossil fuels impacts which are detrimental to our environment. These policies will provide the necessary environmental weighting to balance the economics for bioenergy resources.

Would you like to add something?

Once again, I feel very humbled and honored by this nomination - Thank you!

**LAÉRCIO COUTO,
RENABIO, BRAZIL**

What has been the most exciting issue working with biomass for your personal life and professional experience?

To work with biomass production, mainly with short rotation eucalypt plantations has been like climbing a stair. The first step started in 1967 when I graduated in Forestry at the Federal University of Viçosa, in Viçosa, Minas Gerais, Brazil.

After working for several years as a forest-



Laércio Couto thinks that Brazil will play an important role of supplying the increasing demand of biomass for energy of European countries.

Eucalyptus urophylla in Minas Gerais. This was step two and there started my learning process about the influence of growing stock on the growth and yield of eucalypt plantations in Brazil.

Later, in 1977, I started a PhD at the Faculty of Forestry of University and the theme of my thesis was the nature and uses of the timber production function with a case study with Eucalyptus grandis in Brazil. The third step was my post-doctorate studies at Colorado State University when I had the opportunity to work in a project comparing short rotation eucalypt plantations in Brazil with the short rotation wood crops in USA. All these studies and opportunities lead me to start a project in Brazil with dense plantations of clonal eucalypts to produce biomass for energy in short rotation.

The exciting issue is the opportunity that I had in my professional life as a forester, professor and researcher, to work with the best experts of this area in the world and to be in Brazil where we have the most developed silvicultural techniques for eucalypt plantations and where the climatic and soil conditions along with availability of land at a low cost allow us to have very big areas with short rotation clonal eucalypt plantations for energy. To participate in the advancement of silvicultural techniques to help supply the increasing demand of biomass for energy in Brazil and in the World, is a really exciting feeling.

According to your work and experience how do you see the future for the bioenergy sector?

There is an increasing movement in the whole world for the substitution of fossil fuels by renewable sources of energy. Among them, biomass is a very important one be it from forests, agriculture crops or from grasses. In Europe for example the demand of pellets and/or woodchips for heating and for electricity generation is very big. Countries such as USA, Canada, Chile, South Africa, Brazil, will play a very important role in supplying the increasing demand of biomass for energy of European countries.

On the other hand, even in Brazil, there is an increasing awareness that biomass from the native forest like the Amazon, Caatinga and Cerrado, will not be allowed to be used in the biomass for energy supply chain. They will have to be substituted by biomass from eucalypt plantations, mainly in degraded pasturelands.

What and which areas do you think should be developed in short and long terms?

In some countries in North America and in Europe there is a very well advanced technology to plant and to harvest short rotation woody crops such as willows and poplars. Planting and harvesting machines have been developed and are already being used with success as in UK and Sweden for example. In Brazil we have developed the short rotation clonal eucalypt plantations to produce biomass for energy in a very short rotation, 1 to 2 years.

We are right now in the stage of studying harvesting systems and also ways to reduce the cost of plantations establishment and tending. I don't believe there will be any big issues in developing such systems for this kind of eucalypt plantations in Brazil. The next step and a very important one will be to detect which industrial processes can use the biomass produced by such kind of short rotation eucalypt plantations.

Would you like to add something?

I would like to say that this work I have been doing since 1975 when I started my MSc at UFV in Viçosa and culminated now with the short rotation dense clonal eucalypt plantations to produce biomass for energy was possible only because I had very good advisors, friends, colleagues, collaborators and supporters and my team at RENABIO. Without their support nothing would have happened. I would like to congratulate the organization of this important meeting that every two years brings us with the most advanced techniques to produce and use biomass, in the world.

"In Brazil we have developed the short rotation clonal eucalypt plantations to produce biomass for energy in a very short rotation, 1 to 2 years."

er in reforestation projects, I went back to the University in 1975 to do a MSc course in Forestry. My thesis dealt with the influence of the initial spacing in the growth of

World Bioenergy Association (WBA) has positioned itself to play a leading role in bioenergy globally, aiming to serve companies, associations, researcher, and other actors across the sector. Join the BioenergyConnect and become an early adopter for the future development of the bioenergy sector around the globe!

By Karin Haara, World Bioenergy Association

BioenergyConnect – committed to promoting and expanding bioenergy across the globe

WBA WANTS RESEARCHERS in Rio to have contact with their counterparts in Copenhagen, for example, and for the heads of bioenergy industry associations across Europe and Asia to have a forum where they can exchange information and ideas about pressing challenges and best practices.

WBA's primary tool in this effort is BioenergyConnect, a web-based portal which has been under development for some time and is now ready to be launched in the coming months.

Our vision sees BioenergyConnect becoming the premier forum for bioenergy professionals to make contacts and exchange ideas. The portal, to be accessible via the WBA website, www.worldbioenergy.org, will allow paying subscribers to create and manage their own profiles, view the profiles of and make contact with other members, book

meetings at special events, and participate in BioenergyConnect discussion forums on a wide range of contacts.

This new portal will transform the WBA website into the ideal, virtual meeting place for smart collaboration where members can have discussions, share information and start projects, and where non-members can find information and contacts.

Why is it good for bioenergy businesses to build up their business and research networks through BioenergyConnect?

Because of WBA's unique ability to bring together our networks of buyers, sellers, investors and conference organizers, and by doing so helping them to connect with the right partner.



Users can book meetings and respond to inquiries in real time with a BioenergyConnect enabled mobile phone.

The portal, which will function primarily as a subsection of the WBA website, will serve as an important tool for helping businesses collaborate with one another. As such, it will function as a complement to WBA's other activities by facilitating the creation of networks between relevant actors in the bioenergy market.

With BioenergyConnect, the WBA website becomes a "window of opportunities" for member companies, making it easier for them to do business with one another. As the portal develops, the website will hopefully also serve as a model for other bioenergy associations looking to mirror WBA's approach to strengthening its member network.

As we push through with the final stages of BioenergyConnect's pre-launch development, WBA is looking for a few forward-thinking companies to join us in order to ensure the venture's success during its early stages.

Joining WBA's BioenergyConnect now as an early adopter gives your company an exclusive opportunity to be a part of shaping what is certain to become a vital tool for the future development of the bioenergy sector around the globe.

For more information please contact: Karin Haara: karin.haara@worldbioenergy.org



Of the 1.3 billion of the poorest people in the world, 70 percent of these are women. These people are energy poor, in that they have an absence of choice in the energy they access or use in their daily lives.

By Benard O. Muok, African Centre for Technology Studies, b.muok@acts.or.ke

The gender perspective of bioenergy policy in Africa

HISTORICALLY, THE CONCEPT OF GENDER NEUTRALITY, which assumes that women and men have the same needs for energy services, has been applied to energy service planning. However, such gender-blind planning is now becoming exposed as unsustainable and efforts should be made to redress these issues.

It's important to recognize that the energy-poverty nexus has distinct gender characteristics. Within households, where there are adult men and women, the gendered division of labour generally allocates the responsibility for household energy provision to women.

Therefore, energy poverty – a situation where energy service is not available to a household or any other consumer in the desired form and quantity – is also a problem that has a disproportionate effect on women and girls, especially in rural areas.



Clean cook stove in Ethiopia. (This is also being introduced for trial in Kenya.)

“Over 70 percent of Africa’s households rely on biomass as the primary source of domestic energy.”

THE MOST OBVIOUS FACTORS relate to time and physical effort, where long hours are spent gathering fuel. As fuel becomes scarce due to over-harvesting, land clearing or environmental degradation, many women in fulfillment of their reproductive gender roles, are forced to travel further and spend more time and physical energy in the search for fuel. Furthermore, the deterioration of natural resources reduces opportunities for income-earning activities and greatly increases women’s unpaid work.

OVER 70 PERCENT of Africa’s households rely on biomass as the primary source of domestic energy. Burning biomass to provide energy for cooking and space heating is in most cases done in very inefficiently and poorly ventilated kitchens using inefficient three-stone fires. Women and children are therefore more exposed to biomass-based indoor air pollution. Continued dependence on biomass for cooking and lighting disproportionately predisposes women and children to health hazards of indoor air pollution.

Historical biases in access to economic and other resources also results in women being economically less endowed than men. As a result, technologies that emphasize economic and financial sustainability are less accessible to women. In addition, decisions about access to energy supply are male dominated at the national level and there are income disparities between men and women. Most rural women have limited economic control at the household level while men control household income.

AS A RESULT, it is necessary to enhance women’s ability to afford to utilise different forms of energy, particularly the cleaner biomass forms and to develop economic incentives for investment in different forms of energy development. There is also a need to promote equitable access and use of modern biomass sources especially the emerging ones at affordable rates to address the energy needs of the poor.

For more details about the gender perspective of bioenergy policy in Africa, and to read the authors policy recommendations, visit www.worldbioenergy.org.



Village based biodiesel project in Chennai India.



Mother and child in a smoky cooking shelter.

It is important to understand the effects of introducing bioenergy supply systems to the food, water and land issues. Land areas, that have been degraded and wasted in historical times are possible new resources for production of biomass for energy. Closing the loop through optimization of all resources is essential to minimize conflicts.

By Johan Vinterbäck and Svetlana Ladanai, Swedish University of Agricultural Sciences

Fair and sustainable use of biomass and natural resources

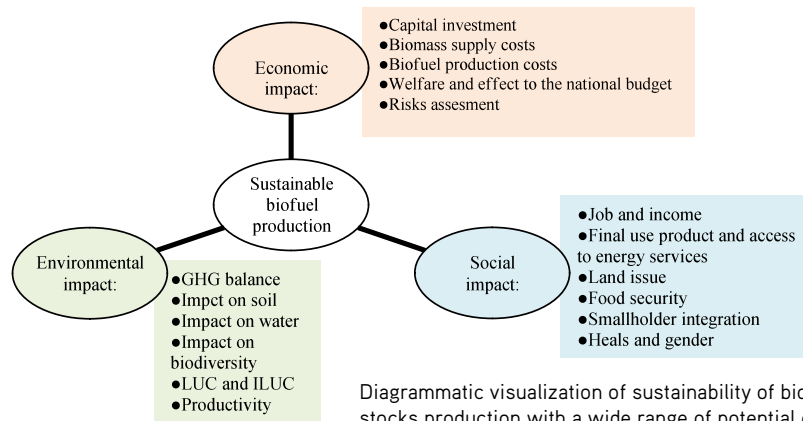
The global growth in energy demand is likely to continue; the International Energy Agency predicts an energy demand increase by 40% between now and 2030. However, the way in which the world's population meets its energy needs is not sustainable. Rising energy prices, geopolitics as well as concerns over increasing oil prices and the resource depletion, national security, and the impacts of greenhouse gas emissions on global climate change are driving large-scale efforts to implement sustainable energy alternatives and have prompted countries to develop policies that promote alternative energy sources. The use of biomass energy is a widely accepted strategy towards sustainable development and sees the fastest rate with the most of increase in power generation followed by rises in the consumption of biofuels for transport.

Synergistic approach necessary

It is important to understand the effects of introducing an adequate bioenergy supply linked to the food, water and land issues for bioenergy. Moreover, it is important to avoid possible negative environmental impacts of this supply. Therefore, it is necessary to promote integrated and synergistic policies and approaches. Increasing the use of e.g. biodiesel could lead to improved economic development and poverty alleviation, especially in rural areas, since it attracts investment in new jobs and business opportunities for small- and medium-sized enterprises in the fields of production, preparation, transportation, trade and use. In this way, the new fuels could offer considerable potential to promote rural development and improve economic conditions in emerging and developing regions. Moreover, perennial-, non-food- and industrial crops require minimal input and maintenance and therefore offer several benefits over conventional annual crops.

Site specific factors important

The land used for biomass feedstock production is another important factor in determining bioenergy sustainability. Areas, that have been degraded and wasted in historical times are possible resources for production of renewable energy, and global energy sup-



Diagrammatic visualization of sustainability of biofuel feedstocks production with a wide range of potential environmental, economic and social impacts (Source: IEA, 2010).

ply may be provided from biomass grown on these areas. Agroforestry has a high potential to simultaneously satisfying many important objectives at ecosystem, economic and social levels. However, the pattern of competition between fuel and food crops is not clear yet, and this will depend, among others, on whether food security policies are in place. Thus, whether food prices will rise owing to an increase in biofuel demand will depend, more on trade barriers, subsidies, policies and limitations of marketing infrastructure than on lack of physical capacity. One of the main options for greenhouse-gas mitigation is the sequestration of carbon in soils. There are plant species that can do this and provide at the same time renewable biofuel resources.

Harvesting residues are increasingly utilised to produce energy and the impacts of these management practices are not always well understood. Along with the growing interest in whole tree harvesting (WTH), concerns have been raised about potential ecological risks. A series of recommendations and good-practice guidelines (GPG) for WTH that are based on various scientific studies and include prescriptions and mandates to minimize environmental damage caused by whole tree harvesting for bioenergy has been developed.

Water management and biodiversity issues

Water has a multivariuous relationship to energy. However, that biofuels/biomass compete for water is not inevitably the case.

Thus, afforestation, reforestation and agroforestry practices can reduce wind erosion, improve shelter, reduce dryland salinity, increase water status of adjacent agricultural lands, regenerate and stabilize water resources and – if properly sited, designed and smart species selection used – having no significant impact on catchment flows. It is e.g. critically important to use low-quality water sources and to select the crops and countries that produce bioenergy feedstock in the most water-efficient way. High-energy demand of irrigation could be reduced by a factor 3 if surface water is used for irrigation instead of water pumped from a depth.

Production of biomass can have both positive and negative effects on species diversity. However, woodfuel production systems as well as agroforestry have the potential to increase biodiversity. Closing the loop through the optimization of all resources is essential to minimize conflicts in resource requirements as a result of increased biomass feedstock production. A systems approach where the agricultural, energy, and environmental sectors are considered as components of a single system, and environmental liabilities are used as recoverable resources for biomass feedstock production has the potential to significantly improve the economic, social, and environmental sustainability of biofuels. Overall, maximizing benefits to biodiversity while minimizing negative impacts is most likely to occur in the presence of adequate knowledge and frameworks, such as for example certification systems, policy and guidelines.



Build a strong future for modern sustainable bioenergy by joining WBA!

The importance of modern bioenergy and the huge unexploited amounts of sustainable biomass for energy available must be communicated to politicians and other decision makers, investors and the public. World Bioenergy Association is working to spread knowledge about the benefits that efficient use of sustainable biomass for energy gives all over the world.

Join the NEW INTERNATIONAL VOICE OF BIOENERGY!

World Bioenergy Association offers to:

- Look after your interests as a bioenergy actor.
- Develop and promote certification and standardization programmes for Bioenergy.
- Demonstrate the potential and benefits of bioenergy.
- Create a business and research platform for communication and meetings.
- Take an active role in the international policy making on bioenergy.
- Highlight the socio-economic benefits when exploiting biomass for energy.

Membership forms: www.worldbioenergy.org

worldbioenergy.org »



Delivering a renewable future

WBA is a member of the International Renewable Energy Alliance (REN Alliance) together with the global associations for geothermal, hydropower, solar and wind. REN Alliance has established a collaboration with the International Renewable Energy Agency (IRENA), the intergovernmental organization on renewables.



The bioenergy industry's **NEW VOICE**
on the international stage:

World Bioenergy Association

We invite all interested national and regional organisations, institutions and companies to join!

Whether you are looking for the latest industry developments or searching for the perfect partner, World Bioenergy Association should be your preferred destination.

To learn more and apply for membership, please visit us at: **www.worldbioenergy.org**

And stay tuned for more exciting developments as we prepare to launch BioenergyConnect later this year...

