



WOOD-BASED BIOENERGY: THE GREEN LIE



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The impact of wood-based bio-energy on
forests and forest dependent people

Wood based bioenergy: the green lie

THE IMPACT OF WOOD-BASED BIOENERGY ON FORESTS AND FOREST DEPENDENT PEOPLE

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Introduction

By Fiu Elisara Mata'ese, Chair of the Board, Global Forest Coalition

The European Union (EU) recently admitted that agro-fuels might be as much as four times more damaging to the climate than conventional fuels due to their indirect impacts. Still, such indirect impacts are being ignored in EU policies. Promoting woody bio-energy ignores the fact that a rapid increase in wood demand will have immense negative impacts on the world's forests and forest peoples as well as on indigenous communities that are already suffering from the direct and indirect impacts of monoculture tree plantations being expanded in their lands and territories for this purpose.

The demand for industrial wood bio-energy is causing large areas, especially in the South, to be taken over by monoculture tree plantations to serve the interests of the North. The displacement of North American paper production increases the likelihood of massive pulp mill and plantation expansion in South America, South-east and East Asia and southern Africa as well as in Russia. The demand for wood (and other forms of biomass) will rise even further as 'second generation' agro-fuels are becoming commercially viable and economically attractive. So far, these liquid fuels remain largely in the research arena and development phase, but biotech firms, pulp and paper companies, and oil firms have joined forces to invest billions of dollars into research on unsustainable wood-based agro-fuels, including research in genetically engineered trees.

Genetically engineered (GE) trees pose a new threat to forests, forest-dependent communities and the climate. It is impossible to predict the impacts of GE trees because unexpected mutations are the norm rather than the exception. This is true with all genetically engineered plants. Trees can spread themselves across large areas and GE trees can easily establish themselves in native forests and/or cross-fertilize with native trees. Unstable low-lignin trees are being engineered for cellulosic ethanol production, whereas fast-growing and cold-resistant trees are engineered for wood bio-energy for heat and electricity.

Deadwood, branches, leaves and twigs and even tree stumps are increasingly defined as 'residues' which are essential for recycling nutrients and thus for keeping soils fertile, for biodiversity enhancement, and for carbon storage. However, the concern is, the demand for wood biomass far outpaces the production of "residues".

A recently released study by the Finnish Environment Institute and others <http://www.ymparisto.fi/print.asp?contentid=351875&lan=en&clan=en> highlighted the importance of taking into account soil carbon emissions in climate change mitigation and the impact removing wood

residues from forests might have on such emissions. The study concludes that to maintain the carbon storage, the accumulation of organic material in forests should increase. However, this is not compatible with the present bio-energy goals for forests and with the increased intensive harvesting of biomass in forests.

The European debate regarding biomass has so far largely focused on sustainability standards – which the European Commission has, for the time being, ruled out as far as EU-wide standards are concerned. The question whether a further massive increase in Europe's demand for wood can possibly be met sustainably, particularly in a global market, has been largely ignored in the policy debate. Yet no standard can prevent higher prices for wood driving plantation expansion and increased logging elsewhere in the world. The wider impacts of ecosystem conversion to industrial monoculture plantations and greater and more destructive logging of natural forests are likely to be severe. By driving up the European demand and the global price for wood, industrial bio-energy is set to increase land grabbing, speculation for tree plantations, expand destructive logging, and speed up the conversion of biodiversity rich native forests to monoculture tree plantations.

Replacing highly energy-dense fossil fuels with plant materials requires far more land per unit of energy than almost all other types of energy. Greater pressures on forests and other ecosystems, on soils and freshwater as well as more land-grabbing for tree plantations are consequences of a new global market in wood for bioenergy. As an Indigenous person myself from the South, I am concerned that the main victims are inevitably going to be the Indigenous Peoples and other forest-dependent peoples in the South, in particular women, who depend on access to forests for fuelwood and other small-scale bio-energy extraction for their families.

Plantation expansion and forest degradation for wood bioenergy in Europe

By Almuth Ernsting, Biofuelwatch, UK

BACKGROUND

The media image of renewable energy tends to focus on wind turbines and solar panels, but in fact about 68.5% of all “renewable energy” in the EU comes from bioenergy¹. The European Renewable Energy Council predicts that, by 2020, bioenergy will make up 13% of total energy use in the EU, compared to approximately 7% for all other renewable energy combined.² Wood burning is likely to continue providing the largest percentage of bioenergy generation in terms of energy output, although agrofuel use is continuing to rapidly expand. Monocultures of miscanthus (an invasive perennial grass native to subtropical and tropical regions of Africa and southern Asia), which are promoted for power stations as well as being considered for second generation agrofuels, and biogas, much of it from maize monocultures in Germany, are also supported by governments in the EU and will put further pressures on land and ecosystems in Europe. Bioenergy is being promoted primarily through national subsidy schemes, including tax rebates, as well as EU-subsidies for research and development.

The demand for wood (and other forms of biomass) will rise even further if ‘second generation’ agrofuels, i.e. liquid agrofuels made from solid biomass, became commercially viable. So far, these liquid fuels remain largely in research and development phase, with many efforts to genetically engineer microbes capable of liquefying solid biomass without high temperatures or pressure, genetically engineering trees so that they can be more easily turned into liquid fuel, as well as

¹ Eurostat 2009 Yearbook, figure 13.1

² Renewable Energy Technology Roadmap 20% by 2020, European Renewable Energy Council

thermal conversion technologies. Biotech firms, pulp and paper companies and oil firms have joined forces to invest billions of dollars into research on wood-based agrofuels for cars and planes, but so far these are not widely feasible or available. Burning woodchips and wood pellets in power stations or wood boilers faces far fewer technological hurdles, and is comparatively cheap and easy.

Industrial bioenergy bears little resemblance to traditional uses of biomass, still common in much of the Global South. Replacing highly energy-dense fossil fuels with plant materials is problematic because it requires far more land per unit of energy than almost all the alternatives.³ Much greater pressures on forests and other ecosystems, on soils and freshwater as well as more land-grabbing for tree plantations are the certain consequence of a new global market in wood for bioenergy.

FROM STUMP REMOVAL TO PLANTATION EXPANSION IN EUROPE

It is widely, though wrongly, assumed that wood power stations in Europe burn only ‘residues’, such as sawdust and mill ends, or branches and trimmings, not whole trees. Even the use of residues is potentially problematic, since materials such as sawdust are often in demand already for low-grade wood products. Burning residues for heat and electricity results in displacing other demand and can thus trigger more industrial logging and plantation expansion. Furthermore, deadwood, branches, leaves and twigs and even tree stumps are increasingly defined as ‘residues’ even though they are essential for recycling nutrients and thus keeping soils fertile, for biodiversity and for carbon storage.

The demand for wood biomass far outpaces production of “residues”, and so increasingly, whole trees are being turned into woodchips and pellets for power stations. In Wales, for example, trucks transport whole logs to a power station in Port Talbot. A far larger, 350 MW, wood power station is being built in the same town.⁴ Similarly, complete logs are piled up outside a Scottish

³ Energy Sprawl or Energy Efficiency: Climate Policy Impacts on Natural Habitat for the United States of America, Robert I McDonald et al, PLoS ONE 4(8): e6802. doi:10.1371/journal.pone.0006802

⁴ http://images.google.co.uk/imgres?imgurl=http://www.whatiscop15.net/wordpress/wp-content/uploads/2009/12/giles-023b1.jpg&imgrefurl=http://www.whatiscop15.net/2009/12/activists-target-biomass-plant-in-south-wales/&usq=__aMsEHxVcnT227CyHz8K2O6WNO9I=&h=753&w=500&sz=149&hl=en&start=8&um=1&itbs=1&tbnid=1j5Jj6uAH0gqeM:&tbnh=142&tbnw=94&prev=/images%3Fq%3Dport%2Btalbot%2Bbiomass%26um%3D1%26hl%3Den%26tbs%3Dsch:1

bioenergy power station.⁵ In Germany, 40% of all wood pellets produced in 2009 were made from whole logs, not “residues”.⁶

To satisfy the fast growing demand for wood biomass, “whole tree removal” practices are becoming increasingly common. Scandinavian companies pioneered this practise, which involves clearing twigs, branches and leaves and often even undergrowth. Increasingly, even stumps are being removed.

German forester Peter Wohlleben describes how ‘whole tree removal’ practices were used in Germany after storm damage: “A so-called ‘woodcracker’ runs across the area, pulls out even tree stumps which are piled up and dried...heavy machinery has run across the soil several times so that the forest soil is compressed like a sponge but, contrary to the sponge it cannot bounce again and loses many ecological functions.”¹

In Germany, those practices have so far only been used in a few tree plantations, but they are being promoted in many other European countries as well as in North America. A recent review of the impacts of stump removal for bioenergy lists depletion of soil organic matter and soil nutrients, greenhouse gas emissions from soils, increased soil erosion and compaction and increased herbicide requirement (the latter presumably on plantations), yet in Finland, stumps are expected to be removed across tens of thousands of hectares this year to procure 1.4 million m³ more biomass for energy⁷.

Short-rotation and other tree plantations are subsidised either directly or through general bioenergy subsidies in many part of Europe. In the UK, the Energy Institute, which is partly funded by the government, is mapping 10% of the country’s land, including moorlands, as ‘suitable’ for bioenergy plantations such as willow. ⁸ In Germany, short-rotation tree plantations are being established by energy companies such as Vattenfall and RWE. In Spain, ENCE, owns over 110,000 hectares of eucalyptus plantations mainly in Galicia and Andalusia for pulp and paper. They are now building a series of biomass power stations and have started establishing the first plantations specifically for energy production.⁹ Ence had an FSC-certificate removed in 2008 due to evidence that they had cut down native forest in north-east Spain for plantations and eucalyptus plantations, which are highly flammable, require large amounts of water, and are responsible for many of Spain’s forest fires.

However, despite plantation expansion and destructive levels of ‘residue removal’, the EU is nowhere near capable of providing enough wood biomass to satisfy its’ own demands for

⁵ <http://www.telegraph.co.uk/sponsored/lifestyle/talkingenergy/6560831/Talking-Energy-renewable-energy.html>

⁶ Wood Resource Quarterly 4Q/2009, Wood Resources International

⁷ Stump Harvesting for Bioenergy: A review of the environmental impacts, J.D. Walmsley and D.L. Godbold, Forestry 2010 83(1):17–38

⁸ www.guardian.co.uk/business/2010/jan/20/moorlands-and-biomass-crops

⁹ Capital Increase Investment Proposition, Ence, 5th March 2010

bioenergy as well as other uses. Competition for wood biomass is escalating, and the increased EU wood imports are inevitable.

EUROPE'S ROLE IN THE NEW GLOBAL MARKET FOR WOOD BIOENERGY

“Robust biomass supply chains are only now becoming established across the UK and biomass fuels are increasingly traded as a global commodity”, UK Minister David Kidney¹⁰

An article in the Jakarta Post cites from a Wood Resources International Report in early 2009: *“Europe is still the biggest market for wood pellets, which are mostly supplied by Canada. But as the market in the United States is surging due to greener policies being adopted by the Obama administration, the US will buy more wood pellets from Canada, leaving Europe short of supply.”¹¹* Indonesian plantation companies are amongst those hoping to fill the gap.

The wood bioenergy sector is still small compared to the pulp and paper industry, but it is almost certainly the fastest growing market for wood and is set to push up the price of wood worldwide, thus making tree plantations and industrial logging ever more profitable.

Developments in the UK illustrate the scale of the new demand: Power stations which will burn around 27 million tonnes of biomass are planned, and up to 700,000 domestic biomass/wood burners are expected by 2020, this in a country which already relies on imports for around 80% of all wood and wood products it uses. Companies cite the US, Canada, South Africa and South America as regions from which wood will be sourced. In 2006, Germany produced 62.3 million m³ and imported 121 million m³ wood and wood products¹². 23 million m³ of wood are already being burnt for energy in Germany¹³ and the government plans to more than double this figure by 2020. In Tuscany, northern Italy, a company is planning 72 MW of wood burning capacity allegedly to be supplied from ‘local sources’, however campaigners have calculated that the demand well exceeds possible supplies in the region and expect it to be met mainly by imports from African countries. Whether directly or indirectly, greater wood bioenergy use will mean more imports into Europe.

¹⁰ David Kidney, Parliamentary Under-Secretary, Department of Energy and Climate Change, 23rd February 2010 www.theyworkforyou.com/wrans/?id=2010-02-23b.317107.h

¹¹ <http://timberbuysell.com/Community/DisplayNews.asp?id=5404>

¹² www.greenpeace.de/fileadmin/gpd/user_upload/themen/wirtschaft_und_umwelt/Footprint_Deutschland_2008.pdf

¹³ http://213.133.109.5/video/energy1tv/Jan%20NEU/Konferenz/Wirtschaft/BioEnergie_g_R/PDF/Forum1-Dr_KIBAT.pdf

WHAT EUROPEAN IMPORTS OF NORTH AMERICAN WOOD FOR ENERGY MEANS FOR FORESTS WORLDWIDE

Most European imports of wood for bioenergy still come from North America, but European demand competes with North America's own wood bioenergy expansion as well as with previously established pulp and paper manufacturers. Existing tree plantations which previously supplied only the pulp and paper industry are increasingly being converted to wood pellets and woodchip production for energy.

Germany company RWE Innology is building the world's biggest wood pellet factory in Georgia, exclusively for export to Europe, in particular the Netherlands, Germany, Italy and the UK. It will have a 750,000 tonnes per year capacity. Two other large plants to produce wood pellets for Europe have opened in Florida and Alabama. The Southern US is the biggest regional producer of pulp and paper worldwide, with 43 million hectares of pine plantations and 6 million hectares of clear-cuts a year, including in biodiverse native forests. Cellulosic ethanol companies are also developing facilities there and, if those succeed, will compete with the demand for wood pellets, with the demand for pulp and paper being displaced to the global South. This displacement of North American paper production makes massive planned pulp mill and plantation expansion in South America, South-east and East Asia and southern Africa as well as in Russia far more likely to go ahead.¹⁴



Wood pellets for bioenergy. Photo: IStock

¹⁴ For details of those plans see "Plantations, poverty and power", Chris Lang, published by World Rainforest Movement, December 2008

Forest destruction and degradation in North America is worsening due to the combined European and US demand for wood bioenergy. One example is the Tongass Forest in Alaska, where increased logging and new concessions in biodiverse old growth forest are planned, at least partly to export wood chips to Europe. In Wales, for example, a 50MW wood power station is proposed which would import most wood chips from Alaska. Large-scale 'salvage logging' of beetle-infested wood, is planned in parts of North America, including in National Parks and roadless forests. Salvage logging in the wake of beetle infestation is advocated on the basis that dead and dying trees provide fuel for wildfires. Yet there is strong evidence that it does not help to protect people and property from fire, results in new roadways that open forests for further exploitation, harms forest regeneration and resilience, can transport beetles in woodchips to new regions, and makes future beetle outbreaks much more likely.¹⁵

THE FIRST WOODCHIP AND PELLET PLANTATIONS IN THE GLOBAL SOUTH FOR EUROPEAN BIOENERGY

The expansion of tree plantations explicitly to meet the new bioenergy demand has been reported from West Papua, the Republic of Congo and Guyana.

In December 2009, Indonesian energy and plantation company Medco was reported to have dropped plans for a new pulp mill in favour of plantations for 'renewable energy' wood pellets and wood chips for export in Merauke District, West Papua.¹⁶ Medco's management plan, for an area still covered in rainforest, states: "*The ...land will be divided into six regions in which all broad-leaved trees in one of the six regions will be completely cut down*"¹⁷ The forests and livelihoods of indigenous peoples in Merauke are already under threat from palm oil expansion for agrofuels, a mega-rice project and mining.

In the Republic of Congo, Canadian firm MagForestry Corp currently ships around 350,000 tonnes of woodchips to Europe for paper production. According to the company website: "*Future operating results are expected to improve based on the strengthening world economy and the expected demand from the biomass energy sector.*"¹⁸ MagForestry owns 68,000 hectares of eucalyptus plantations which had previously been established by Shell Renewables for bioenergy.

¹⁵ Insects and Roadless Forests: Scientific Review of Causes, Consequences and Management Alternatives, S.H. Black et al, 2010, National Alliance for Conservation Science and Policy

¹⁶ Indonesian firm picks green fuel not mill, Tom Wright, Wall Street Journal, 18th December 2009

¹⁷ LG International to Operate Afforestation Business in Indonesia, Maeil Business Newspaper & mk.co.kr, Seung-chul Park, 29th September, 2009, reported by the Environmental Investigations Agency and Telapak, www.eia-international.org/files/news/566-1.pdf

¹⁸ www.magindustries.com/news.aspx?newsid=40&pageid=3

In Guyana, UK bioenergy firm Celenergen has acquired a long lease for over 2,000 hectares and is looking at a future 61,000 hectares for bamboo and marjastica tree plantations, which they plan to establish on grasslands.¹⁹ These are intended for cofiring with coal in the UK.

Industrial tree plantations established to obtain carbon credits in the false name of 'afforestation and reforestation' could also soon supply woodchips and wood pellets, too. According to a preliminary report by Timberwatch about Norwegian company Green Resources, the company, which is planning around 7,000 hectares of tree plantations on biodiverse grasslands in Tanzania in addition to existing plantations in Tanzania and Uganda, may well export woodchips and pellets from the plantations to Norway to help the country meet the aim of becoming 'carbon neutral' by 2020 – regardless of even the carbon emissions from transporting wood from Africa.²⁰

BIOENERGY AND GE TREES

Genetically engineered trees pose a major new threat to forests, forest-dependent communities and the climate. It is impossible to predict the impacts of GE trees because unexpected mutations are the norm rather than the exception with all genetically engineered plants and trees can spread themselves across large areas, hence GE trees can easily establish themselves in native forests and/or cross-fertilise with native trees. Unstable low-lignin trees are being engineered for cellulosic ethanol and/or pulp production whereas fast-growing and cold-resistant trees are attractive for wood bioenergy for heat and electricity.

THE WIDER IMPACTS OF EUROPEAN WOOD BIOENERGY USE

By driving up the European demand and the global price for wood, industrial bioenergy is set to increase land grabbing and speculation for tree plantations as well as more destructive logging.

The European debate has so far largely focussed on sustainability standards – which the European Commission has, for the time being, ruled out as far as EU-wide standards are concerned – rather than on the question whether a further massive increase in Europe's demand for wood can possibly be met sustainably, particularly in a global market. Yet clearly, no standard can prevent higher prices for wood driving plantation expansion and increased logging elsewhere, (anywhere) in the world. The wider impacts of ecosystem conversion to industrial monoculture plantations and greater and more destructive logging of natural forests are likely to be severe. A study by Marshall Wise et al indicates that policies to reduce carbon emissions which regard all bioenergy to be 'carbon neutral' could result in all 'unmanaged forests', all natural grasslands and most pasture to

¹⁹ <http://hugin.info/141872/R/1341211/320732.pdf>

²⁰ Potential Impacts of Tree Plantations under the CDM: An African Case Study, preliminary report by Blessing Karumbidza and Wally Menne, Preliminary Report, December 2009, http://timberwatch.org/uploads/Draft%20Plantation_Projects_under%20CDM%20-%20Blessing%20&%20Wally%281%29.pdf

be destroyed and replaced by plantations by 2065²¹ – clearly a disastrous prospect, but indeed the current trend. The definition of bioenergy as ‘carbon neutral’ is a false one, not only because industrial tree plantations and industrial logging as well as wood transport require fossil fuel use, but also because of significant greenhouse gas emissions from direct as well as indirect land conversion, soil depletion and erosion. Furthermore, even if those emissions were ignored, it still takes decades, particularly in temperate and boreal regions, for new trees to grow and re-absorb the carbon emitted from wood burning. When whole logs are burned in German power stations, for example, much of the CO₂ emitted will remain in the atmosphere for at least up to thirty years. It is clear that greenhouse gas emissions must be reduced rapidly, not in decades to come. In fact, smokestack CO₂ emissions from biomass power stations have been shown to be up to 50% greater for the same amount of electricity as those from coal power stations (which are generally more efficient).

²¹ Implications of Limiting CO₂ Concentrations for Land Use and Energy, Marshall Wise et al, Science 324, 1183 (2009)

The newspaper Financial Times reported on April 6, 2010, that the Swedish power group Vattenfall planned to invest in a Liberian biomass project. The project would see the production of wood chips from Liberian rubber tree waste that can be burnt to produce electricity. Vattenfall says it wants to reduce dependence on coal in its European power stations. We asked a reaction to Silas Kpanan'Siakor, director of the Sustainable Development Institute in Liberia and winner of the 2006 Goldman Environmental Prize.

Your first reaction to this news

The article doesn't mention that the wood chips would come from Buchanan Renewable Energy (BRE). Buchanan Renewable (BR, another branch of the company) has a contract with the Government of Liberia to build an electricity plant that would be powered by wood chips. If this deal goes through, this would mean a major shift in the priorities of the company – supply the Swedish plant with guarantees of higher profit margins or prioritize Liberia and risks drops in profits; because many people won't afford to pay the bills.

What will be the impact on domestic energy needs?

BRE is buying up old rubber trees and turning them into wood chips for export. This is already having serious economic impacts on people in urban areas and large towns that rely on charcoal produced mostly from rubber wood. The price of charcoal has gone up from \$100 to \$200 – about 100%; as more rubber wood is now sold to Buchanan Renewable Energy instead of being burnt for charcoal. The overwhelming majority of us rely on charcoal for our domestic energy needs, therefore this increase in price is significant.

How about the social and environmental effects?

As the value of rubber wood goes up, more and more people will rush to clear secondary forests and replace them with rubber farms. In other areas, farm lands would be converted to rubber plantations and farmers would then shift to nearby forests that would otherwise remain standing.

Another concern relates to the land insecurity that would result from this as well. For example, planting tree crops such as rubber is one way that local populations have secured their land claims for generations. In many instances these trees symbolize an existing land claim. Once those trees are removed they become vulnerable to land grabs by the elites. There are instances in which intra-communal and family land quarrels have resurfaced first with respect to the money paid for the rubber wood and second regarding the ownership of the new trees planted with support from BRE.

Genetically Modified Trees, Bioenergy and REDD: New excuses for their promotion

By Diego Alejandro Cardona, GE Trees and agrofuels campaigner, Colombia

TREES FOR ENERGY: PUTTING MORE FIREWOOD TO THE FIRE

The use of new energy sources to replace the consumption of fossil fuels is indispensable in response to the climate crisis and advancing energy transition. However, demand reduction as well as the energy choices, the pattern in which those new sources are managed, where and how the raw materials are produced, and, mainly, who has the control of these, will determine the positive or negative character of the new energy sources.

Unfortunately the current developments present a dark horizon, full of risks and threats to biodiversity, to the peoples and territories that historically have been victims of the current economic and energy model. The list of new energy sources is long, and it includes among others agrofuels, wind and solar energy, and bio-energy (possibly with 'biochar' production in future).

Wood-based bioenergy receives large-scale investments, development and publicity, and genetically modified trees are being developed for this purpose. Second-generation agrofuels made from wood are being promoted as an alternative to agrofuels from food. It is claimed that

the ethical problem of the competition of fuels with foods would be eliminated²². However, this is a wrong and manipulated statement. **Although the raw materials for second-generation agrofuels can be forest and crop residues, or planted trees, the competition for available agricultural lands, water and labor will undermine food sovereignty.**

Industrial tree plantations, falsely classed as 'forests' and GM trees have found a catalyst for their expansion in the carbon market, and more recently in the development of second-generation agrofuels from wood. Now there are no reasons to change the current operation, but instead intensify it. The results are the expansion of forest monocultures in poor countries, the occupation and degradation of territories and productive lands, the installation of industrial plants in the South, the worsening of living conditions and quality of life in occupied territories, the violation of rights, particularly serious impacts on women and excluded population groups, concentration of power in corporations which control the right to property and technologies, as well as the risk of contamination to a degree which cannot be predicted.

Let us analyze some of the aspects related to the rapid expansion of plantations of trees for energy production: Who are the actors and main beneficiaries? What strategies do they use to expand and attract finance? What are the main risks?

PEERSPECTIVES ON RESEARCH AND PRODUCTION

Research and technological developments for the production of ethanol and other types of second-generation agrofuels, some of them from byproducts of the timber industry, are advancing quickly. Research on genetic modification includes reducing the lignin content in the trees, increasing the growth rates, inducing "altered fertility" and creating resistance to disease, insects or extreme environmental conditions.

Most of this research is being carried out in industrialized countries or with the direct participation of their universities, companies or institutes; however, the peoples and countries of the South have many reasons to be concerned, since some of the plantations which will result from these studies will be established in their territories.

In the United States, however, ArborGen, a joint initiative of pulp and paper giants International Paper, MeadWestvaco and Rubicon, is genetically engineering a cold-tolerant eucalyptus tree for deployment in vast plantations across seven states along the U.S. Gulf Coast. ArborGen has

22 <http://www.gtmresearch.com/report/biofuels-2010-spotting-the-next-wave>

offices in locations around the world including Brazil, New Zealand and Australia. The eucalyptus hybrid that was modified for cold tolerance in fact originated in Brazil, was genetically modified in New Zealand and then transported to the U.S. for mass-replication and outdoor field testing (which is illegal in New Zealand). [http://www.aphis.usda.gov/brs/biotech_ea_permits.html]

The danger with this cold-tolerant GM eucalyptus is that if ArborGen can perfect it in the U.S., it will then export them around the world. This will allow the expansion of ecologically and socially destructive eucalyptus plantations in areas of the Global South that were formerly too cold for eucalyptus. With the skyrocketing demand for wood for bioenergy, the threat of conversion of forests to cold-tolerant GM eucalyptus plantations in these regions is significant.

Those responsible for the study of cellulosic ethanol, biobutanol and other second generation agrofuels identify access to sufficient and cheap supplies of raw material as one of their challenges. "One of the biggest challenges that we face is the localization of sufficient quantities from this fuel to prices that allow us to obtain a benefit", says Lloyd Kolb, head of operations of Lyonsdale Biomass LLC²³. This statement is source of concern. **It is very well-known, the companies of the cellulose sector and paper install their plantations in the countries of the South, where besides having the mentioned conditions – low costs and big quantities – the environmental, social and labor legislations are lax and they allow the violation of multiple environmental rights and of the communities.**

Another reason for concern for the countries of the South, is the fact that the hardwood which grows in their territories contains a higher percentage of sylvans (35%), in comparison with the wood of temperate areas in the north that only reach between 9 and 14%. Sylvan is particularly valuable for ethanol production. The wood used as raw materials from the South is more attractive to industries because they can continue paper production while generating ethanol in the same processing plant.

As seen in Table 1 below, research on new raw materials for fuels, primarily cellulosic ethanol and genetically modified trees is carried out by universities or research institutes in industrialized countries and is funded by multinationals forest and / or energy, a situation which is repeated with the development of technologies, marketing and other stages of the chain. Thus replicates and maintains the colonialist model in terms of energy, technology and economics that has characterized North-South relations.

In the case of ArborGen, Barbara Wells, the CEO of ArborGen spent 18 years working for Monsanto in Brazil. She was the co-managing director of Monsanto Brazil and leader of the Roundup Ready

23 <http://www.csmonitor.com/2005/0505/p17s01-sten.html>

GMO soybean team. The introduction of GMO soybeans into Brazil has been disastrous to forests and communities there. ArborGen now seeks to use Monsanto's model for introducing GMO soybeans to introduce GM trees into Brazil. [<http://www.arborgen.us/index.php/barbara-wells>]

Energy is no longer seen as a right for people and is viewed as any other commodity that can generate profit, hence the concentration of power over it and on new sources, concentration which is favored by the rules and conditions bind of the so-called "free market." This includes patents and property rights. The corporations involved make explicit reference to the exclusivity they have on technology, "... in 1995, Verenium, then with the name Celunol, granted an exclusive license to commercialize proprietary cellulosic ethanol technology developed at the University of Florida." This restricts the exclusive use and benefit of the peoples and countries of the South, where there is projected expansion of plantations in the conditions mentioned above.

Tree companies sell their research results and export plant material to monocultures in the South. This is the case of International Paper, the largest seller of plants in the world, and Rubicon (New Zealand) working in conjunction with ArborGen (U.S.) on the improvement of eucalyptus for the Brazilian market, while also announcing their presence in Chile²⁴. Entities such as the Oak Ridge National Laboratory (USA) and the US Department of Energy are working on the modification of trees to increase carbon storage capacity and the possibility of planting poplars for the production of ethanol and other fuels²⁵. Studies on wood-based fuels, along with multinational oil, paper and energy sectors, fall under the funding models for universities and colleges, sometimes directly by industry.

The processes of research and testing of genetically modified trees are not restricted to the North, but also take place in Brazil, Chile, Thailand, Taiwan and Indonesia. It is important to note companies or institutions in industrialized countries are behind the research in each of these countries. In the case of Brazil these companies include; Monsanto, International Paper, Applied Genomics and ArborGen Alellyx, which are also working in cooperation with Aracruz Cellulose and Suzano. In Chile the processes are led by GenFor, resulting from the union of Silvagen of Canada, Interlink of USA and the Chile Foundation, while in Indonesia work is supported by the Japan Society for the Advancement of Science. Work in Thailand is led by CIRAD of France, while in Taiwan there is an alliance with the University of North Carolina²⁶.

The direct participation of entities of the North in the investigation processes in the South is directly related to the concentration of the power on the products and methodologies obtained by means of the application of patents and rights of property, thereby undermining the sovereignty of

24 LANG, Chris. Árbores geneticamente modificadas, a ameaça definitiva para as florestas. Movimento Mundial pelas Florestas Tropicais e Amigos da Terra, 2004.

25 ÍDEM.

26 WRM Briefing, November 2008. GE tree research – A country by country overview.

peoples and countries where finally they will have the application of technologies and settle the plantations.

Other countries engaged in research for genetic modification of trees are: Australia, Belgium, Canada, China, Denmark, USA, Finland, France, Israel, Japan, New Zealand, UK and Sweden.

EXPANSION AND FUNDING

The forest and paper industry tends to create and use economic figures through which it funds and subsidizes its operations, including tax exemptions or subsidies and incentives for being a suspected activity with a positive impact on the environment. Recently, businessmen and brokers have been lobbying for new funding sources for their business via the carbon market, subsidies for the production of biofuels, in the case of second generation- and through the REDD Plus strategy. The latter will consist of reducing deforestation and forest degradation, forest conservation, industrial logging classed as 'sustainable forest management' and the increase in carbon stocks through sequestration of carbon from the atmosphere²⁷, a misnomer for tree plantations

REDD Plus promotes the expansion of tree plantations falsely classed as 'forest carbon stock' under the Bali Action Plan, which calls for "policy approaches and incentives for issues relating to reducing emissions from deforestation of forest in developing countries (REDD) and the role of conservation, sustainable management of forests and increasing forest carbon stocks in developing countries".²⁸

Under existing REDD-type schemes, forest plantations are increasing, as are the financial resources for them both in industrialized countries and in the impoverished South. In Britain, the government is paying subsidies to producers of energy crops, crops that could in future occupy an over 2.4 million hectares in this region and may include willow plantations – even eucalyptus is being tested for bioenergy in the UK²⁹. The U.S. government is subsidizing research into production of energy from biomass, including GM trees, and field trials with GM trees are found in Germany, Belgium, Brazil, Canada, China, Denmark, USA, Finland, France, Indonesia, Israel, Japan and New Zealand.

27 Parker, C., Mitchell, A., Trivedi, M., Mardas, N. *The Little REDD+ Book* (2009).

28 Propuesta para las negociaciones de cambio climático bajo AWG-LCA Nov 2008.

29 <http://www.guardian.co.uk/business/2010/jan/20/moorlands-and-biomass-crops>

REDD AND EXPANSION OF PLANTATIONS

The risk of expansion of forest plantations as a result of the REDD strategy is greater in the context of negotiations. The definition of forest used in the UNFCCC, better known as "Kyoto forests"³⁰, includes industrial plantations and even bare soil where forests or plantations have been clear-cut, and can even include GM trees. This has resulted in most recent investments in the forestry sector going to plantations.

In January 2010, Ecosystem Marketplace³¹ published a study which includes data up to 2009, showing how the investments of private companies and investors in the carbon storage in forests have increased recently.

Most of the previous has gone to afforestation/reforestation projects (63%), with REDD projects having received 17% of the resources. With REDD Plus including afforestation and reforestation, the most REDD investment could go into plantations as afforestation/reforestation.



Euc

alyptus plantation. Plantations are harmful for biodiversity, water levels and local livelihoods. Photo: IStock.

This makes it possible to get funding under

REDD Plus to establish monocultures of trees and then cut them down, reaping the economic returns derived from their exploitation. Calls for greater promotion of reforestation and afforestation activities and REDD funding for those have become louder, culminating in the Copenhagen Accord.

30 <http://unfccc.int/resource/docs/cop7/13a01.pdf>

31 HAMILTON et al. 2010. State of the forest carbon markets 2009: Taking root and branching out. Ecosystem Marketplace.

It is worth highlighting the current proposals to classify monoculture oil palm plantations as forests, thereby fueling the destruction of forests and plantation establishment. This has been proposed in European Union and in Indonesia.

The European Commission is working on a draft document³² relating to agrofuels and deforestation using the following definition of "continuously forested areas are defined as areas where trees have reached or can reach at least 5 meters tall, forming a crown cover of more of 30%", a definition which includes forests, forest plantations and tree plantations such as palm oil. It further explains that the conversion of forests to palm plantations would not constitute a violation of the sustainability criteria.

Indonesia on the other hand has made enormous efforts to ensure that its strategy for reducing greenhouse gases by 26% by 2020 is accepted, proposing the rehabilitation of degraded areas and new plantations, in the hope of gaining carbon credits through REDD programmes for alleged conservation³³.

The Indonesian Ministry of Forestry drafted a decree that allows it to include oil palm monocultures such as forests, using the UN's loose definition. The goal is "ahead of the implementation of REDD and receive financial incentives to the UNFCCC³⁴.

The latest government statement seems to be against classing oil palm plantations as forests but acacia and other tree plantations are still classed (<http://www.thejakartapost.com/news/2010/04/14/govt-drops-designating-plantations-forests.html>).

Several Southern countries have had pilot projects for the establishment of REDD.

Vietnam has been part of the World Bank's Forest Carbon Partnership Fund since 2008 (FCPF)³⁵. In early February 2010, the deputy minister of agriculture of the country referred to the money which six countries have pledged for the development of REDD, according to its commitments in Copenhagen. At the same time he highlighted the critical role of forests in the climate crisis, the implementation of payments for environmental services in the country and the need to create a favorable legal framework to attract new foreign investors into the plantations sector, all of which are described as forest conservation strategies.

32 http://www.foeeurope.org/agrofuels/EC_implementation_sustainability_scheme.pdf

33 <http://news.mongabay.com/2010/0107-indonesia.html>

34 <http://www.thejakartapost.com/news/2010/02/16/palm-estate-forest-says-ministry.html>

35

<http://web.worldbank.org/WBSITE/EXTERNAL/BANCOMUNDIAL/NEWSSPANHISH/0,,contentMDK:21864371~pagePK:34370~piPK:34424~theSitePK:1074568,00.html>

The examples given above point to an increase in the area covered by forest plantations, whose growth is promoted through their definition as forests, even though they are widely responsible for the destruction of forests.

The results by the carbon markets and the plans to use plantation became evident during the validation meeting of the National Program UN-REDD Bolivia on 18 January 2010. The Representatives of Indigenous organizations recommended conducting "practices activities in terms of training and other concrete actions especially in the area of reforestation", as recorded in the minutes of the meeting³⁶.

There are many risks in establishing tree plantations which have been identified and recognized by members of the UN program for REDD. These risks include the depletion of water caused by the plantations and increasing pressure to convert forest ecosystems³⁷.

Furthermore it is recognized that the risks depend on the design and implementation of REDD, which may be particularly bad in many key countries which are developing REDD strategies and where corruption and inefficiency within government is common. Such drawbacks have also been identified by promoters of REDD, including the weakness of institutions, inconsistency or lack of legislation, lack of transparency in the presentation of accounts, among others³⁸.

FINAL CONSIDERATIONS

In conclusion it can be argued that the model of energy generation from wood, including cellulosic ethanol and other second generation agrofuels, represents the continuation of colonialism over peoples and territories. It follows the analysis of stakeholders and their positions in the production chain, the concentration of research, technology generation and property rights on these corporations, multinational companies, institutes and / or universities in the industrialized North, the re-prevarication of Southern economies where raw materials are produced and where funds and economic benefits are transferred to Northern countries where parent companies are

36 <http://www.pnud.bo/webportal/LinkClick.aspx?fileticket=piEljM0jg2w%3d&tabid=56>

37

<http://www.unredd.org/Portals/15/SBSTA/3%5B1%5D.%20Multiple%20benefits%20from%20REDD%20-%20Barney%20Dickson,%20UNEP%20WPMC.pdf>

38 [REEVE Rosalind, Global Witness. Presentación evento paralelo UNFCCC, Bonn, junio 9 de 2009.](#)

concentrated, and the promotion, development and financing of bioenergy through carbon market and state subsidies, created and implemented from the industrialized countries.

On the other hand, one can foresee the increase of forest plantations, even including GM trees, fostered as a result of REDD. Recent events around the REDD Plus proposal clearly shows how it is being implemented under the market approach, putting at risk the continued existence of large forested areas. They will be replaced by monoculture tree plantations, all in a setting of large risks and uncertainties for the development of local projects.

It is therefore important to emphasize the many conflicts caused by forest plantations, including prior deforestation, soil degradation, changes to water cycles, biodiversity loss, displacement of communities, local economies and permanent jobs disappearance, and undermining the food sovereignty. It is also important to note that there are virtually no independent studies on the potentially dire impacts of commercialization of GM trees on forests, biodiversity and forest dependent peoples. Because of the ability of trees to spread pollen and seeds for many kilometers, it must be understood that the escape of GM trees from plantations into forests is virtually certain and cannot be reversed. The only way to prevent this escape is to prevent the commercial release of GM trees in the first place.

Tree plantations are not forests

By Wally Menne, Timberwatch, South Africa

Most timber produced in the South is exported in the form of logs, or as wood pulp or wood chips. Most value adding takes place elsewhere, and communities in so-called developing countries, where the wood is grown, benefit little. They carry the environmental costs and suffer cruel working conditions and starvation wages, while companies like Veracel, Stora Enso, and Sappi make indecently large profits. It is dishonest to certify tree plantations as 'responsibly managed forests'.

The United Nations Food and Agriculture Organisation (FAO) forest area assessment of 2010 reported that tree plantations were expanding faster than forests were being logged or otherwise destroyed. Yet this expansion was viewed in a positive light, as contributing to a reduction in the loss of 'forest cover'. **In reality, plantation expansion represents an even greater loss of biodiversity than forest degradation due to logging.**

In forested regions like the Amazon, where tree plantations often displace existing forests or are planted on land where forests previously grew, the situation is different from where grasslands dominate regions like southern Africa. But industrial-scale tree plantations still cause the loss of both agricultural and natural biodiversity, and bring negative impacts to human communities and rural economies. Environmentally and socially destructive timber plantations take land that is suitable for productive and sustainable agricultural activities.

Tree plantations destroy natural vegetation and wildlife where they are established, and have devastating impacts on both ground and surface water resources. The heavy water usage, soil erosion and siltation, and alien invasive weeds that go with plantations impact negatively on farms and communities neighboring plantation areas, and threaten the viability of adjacent ecosystems and agricultural land.

Heavily logged forests can recover naturally over time, just as our skin heals after an injury, but the damage caused by plantations is different. **Instead of 'healing' like the forest, they grow larger and spread their invasive seedlings into surrounding**

landscapes. Like a cancer they spread into near-inaccessible places on mountainsides and in ravines where they damage sensitive ecosystems. In South Africa, more than 1,6 million hectares has been invaded by trees that escaped from plantations, especially Black Wattle (*Acacia mearnsii*) which was introduced from Australia more than a hundred years ago. Without a major alien invasive plant eradication programme, at enormous expense to landowners and the government, timber plantations will continue to degrade the land.

The Global Forest Coalition) defines forests as “**complex tree dominated ecosystems with particular structural biotic and abiotic components assembled within temporal and spatial limits and with a self-sustained successional dynamic determined by its biodiversity**”.



Forests provide livelihoods for millions people like here in the Congo Basin. Photo: Marieke Sandker.

In the context of the recent push to promote genetic engineering, and especially the use of ‘terminator’ technology, interfering with the ability of trees to grow and breed naturally would increase the potential of tree plantations to damage ecosystems and communities. If this untested technology is allowed, and genetically engineered trees are introduced freely into the environment, even greater biodiversity losses could occur. There would be no environmental benefits at all, contrary to the false claims of its proponents.

The industrial tree plantation model cannot produce the same environmental goods and services as healthy biodiverse forests. However, the plantation industry uses the misleading 'forest' definitions of the FAO and goes out of its way to mis-represent and to exaggerate the benefits of tree plantations. False claims of the benefits of tree plantations have been further legitimized by their inclusion in the Clean Development Mechanism (CDM) of the Kyoto Protocol, which also allows *Jatropha* and Oil Palm agrofuel plantations to earn carbon credits.

TREE PLANTATIONS CARBON SINKS

In December 2003 the UNFCCC made the decision to approve the use of genetically engineered tree plantations as carbon sinks under the CDM. There is little doubt that this was driven by corporate interests, who on the one hand, faced with pressure to meet emission reduction targets, and on the other, saw an opportunity to exploit Southern nations' land and water resources in the name of making profits. How genetic engineering of trees can make timber plantations any more a legitimate CDM activity is not clear. If their introduction takes place, it will only exacerbate the already known negative environmental and social impacts of large-scale tree plantations.

Although it is accepted under the CDM that plantations are not the same as forests, they still qualify for carbon credits. Attempts to give credibility to the use of plantations as carbon sinks, by making FSC certification a prerequisite to qualifying for CDM registration and funding from the World Bank prototype carbon fund, are not acceptable. The concept is so deeply flawed that no amount of cosmetic gloss will change the reality that tree plantations are not genuinely capable reducing CO₂ from the atmosphere.

Research into soil carbon storage and carbon capture by other vegetation types has shown that converting land from permanent pastures or natural grasslands to timber plantations can result in a net release of carbon into the atmosphere. Add to this the GhG emissions from the planting, logging, transporting and processing of the "carbon sink" timber, and there will be little doubt that there should in fact be a **carbon debit system for tree plantations**.

Many people have questioned the logic of the assumption that carbon credits are a valid way to slow the rate of global warming. Surely the only way would be to enforce reduction targets, and to use the penalties paid for non-compliance to fund landscape restoration projects?

Environmental groups in the North have traditionally opposed the importation of timber from tropical forests, and this has led to bans on the purchase of timber from sources that are considered to be 'illegal' or 'unsustainable'. However, it is difficult to know if a shipload of wood arriving at a European port is from a logging operation with no social and environmental impacts, or one causing terrible damage to forests, and destroying the livelihoods of indigenous peoples living in or around those forests.

The response to this uncertainty has been 'forest certification', intended to give buyers of wood products assurance that wood from certain sources had been sustainably produced in terms of a set of 'standards'. One of the best-known certification systems is the Forest Stewardship Council (FSC), based in Bonn, Germany.

The FSC was established after the Earth Summit in Rio de Janeiro in 1992, with the aim of protecting the dwindling forests of the world. It was supported by environmental organizations, as well as timber companies. This seemed to be the ideal solution, a win-win solution for Nature, people and business.

However it had problems. Getting consensus on policy issues was not easy, and before long the question of whether FSC should certify tree plantations arose. It was argued that plantations could produce wood more quickly and efficiently than forests, and plantations could save forests by meeting demand for pulpwood. A special new 'plantation' principle was added to the nine that had already been agreed on for forests, but this decision led to a problem that has yet to be resolved.

The feel-good tree logo of the Forest Stewardship Council (FSC) is stamped onto many forest and tree plantation products, including paper. The average consumer will only know that they are claimed to be from a 'responsibly managed forest', but there is nothing to show that they could be from environmentally harmful plantations, and not from forests.

The words "Responsibly Managed Forests" bring to mind wild woods, teeming with a diversity of life, where only selected trees are carefully harvested. The impression is created that buying FSC certified wood products is beneficial to Nature and to people. **Standards that recognize the harm that plantations cause to the land, to local people, and to ecosystems are needed.** An appropriate symbol to denote a 'plantation' as opposed to a forest should be designed, and timber growers and consumers alike properly educated.

The large-scale tree plantations that produce much of the wood and paper certified by FSC are often planted on land that was previously used for food production or grazing. The other land taken for plantations is wildlife habitat, and alien plantation trees destroy all natural biodiversity where they are planted. They deplete and pollute water resources – especially small streams and wetlands that support the needs of local communities and wildlife. They displace food farming, undermining food security, health and the livelihoods of local communities including Indigenous Peoples.

CONCLUSION

The countries being targeted for new tree plantations need to be aware that it is their own responsibility to make the right decisions concerning permitting plantations in their territories. A wrong decision will result in more damage to our planet's biodiversity and sustainability. Existing tree plantations will need to be properly assessed to determine their full environmental costs and their socio-economic viability and value if any. Only then can informed decisions be made whether existing plantations should remain.

At civil society level, the 'green' forest protection lobby in overdeveloped Northern countries, needs to help discourage consumers from buying products derived from timber extracted from all unsustainable sources – including both indiscriminately logged forests, and tree plantations that threaten to destroy biodiversity rich ecosystems and the communities that derive sustainable livelihoods from these natural resources.

It can be assumed that any increase in timber production must result in more industrial activities somewhere on the planet, and consequently an increase in GhG (Greenhouse Gas) emissions. Similarly, if the recycling of paper and packaging increases, there must be extra industrial activity to accommodate the demand that drives recycling. Even if the use of fossil fuels reduces as renewable energy starts to feed into the global energy supply, increases in pulp and paper consumption will mean a massive increase in GhG emissions. Ultimately, any new plantation will be a net source of atmospheric carbon.

Organizations that offer certification services, such as the FSC, need to be more honest, and make consumers aware of the negative environmental and social effects of tree plantations. This also applies to certifying plantations grown for the production of agrofuels and biomass for fuel, and which threaten to undermine food sovereignty in the countries that have been targeted. They also increase the rate of deforestation and displace forest dependent and forest dwelling Indigenous Peoples.

Because plantations have been given the FSC green rubber stamp of approval, the industry needs not worry about a thing – just carry on with 'business as usual'. But in the end, the consumers of forest and plantation products (including you) must decide. Further reading:

- Global Forest Coalition – www.globalforestcoalition.org
- Timberwatch Coalition – www.timberwatch.org
- World Rainforest Movement – www.wrm.org.uy
- The Woodland League – www.woodlandleague.org

- Friends of the Earth – www.foei.org/en/campaigns/forests
- FSC Watch – www.fsc-watch.org
- GeaSphere – www.geasphere.co.za
- Pulp Mill Watch – www.pulpmillwatch.org
- Carbon Trade Watch – www.carbontradewatch.org
- Biofuel Watch – www.biofuelwatch.org.uk

