


# BIOFUELING RAINFOREST DESTRUCTION





*'Two to nine times more CO<sub>2</sub> is released than would be saved by using an equivalent area of land to grow biofuels for 30 years. Put another way, to pay back the initial release of CO<sub>2</sub> from clearing the forest would take 60 to 270 years of growing biofuels (using current technologies).'*

**2007 King Review for the UK Government Treasury**

## CLIMATE CHANGE – A BRAND NEW MARKETING OPPORTUNITY FOR PALM OIL

RSPO members like the ADM-Kuok-Wilmar alliance see biodiesel as an opportunity to expand their palm oil market share.

The alliance brings together Wilmar, the 'largest palm biodiesel manufacturer in the world', and ADM, the 'world leader in renewable transport fuels'.<sup>289</sup> They praise biofuel use because of the notional reduction in CO<sub>2</sub> emissions it provides compared to fossil fuel use:

'Growing concerns about global warming and the impact of carbon emissions on the environment have resulted in several initiatives on emissions control which will encourage the use of renewable fuels and energy. This represents tremendous opportunities for oilseed growers and processors.'<sup>290</sup>

The idea of producing an endless supply of inexpensive and climate friendly fuel from what sprouts from the soil seems almost too good to be true for a world worried about global warming, yet keen not to change its lifestyle aspirations or the efficiency of its vehicles.

And it is ... too good to be true, but it does present a great market opportunity to expand palm oil production. Just look at the volumes involved.

### NAVIGATING THE NUMBERS: KEY NUMBERS FOR CALCULATING LAND AREA NEEDED TO REPLACE A GIVEN AMOUNT OF DIESEL

The energy content of 1 tonne of diesel is equivalent to 1.1 tonnes of vegetable oil.<sup>291</sup> Or, 1 tonne of vegetable oil can replace 0.9 tonne of diesel.

1 hectare of mature oil palm plantation in Indonesia gives an average yearly harvest of about 3.7 tonnes of palm oil.<sup>292</sup>

1 hectare of mature oil palm plantation yields the energy equivalent of 3.36 tonnes of diesel.<sup>293</sup>

One tonne of vegetable oil is 1,100 litres;<sup>294</sup> the energy in this is equivalent to 990 litres of diesel.

## GETTING IT ALL IN PERSPECTIVE – PALM OIL IS NO SILVER BULLET FOR REDUCING TRANSPORT EMISSIONS

**'Producing energy crops for biofuel requires a large area of arable land, which for some countries in the EU is a problem. [...] With current conventional crops such as rapeseed, the task of growing sufficient volumes domestically to meet the 10% target appears to be effectively impossible, as it would require most of, or more than, the arable land available. In order for the targets to be met, it is likely that a large amount of the biofuel will need to be imported.'**<sup>295</sup>

Oxera economic consultancy, 2007

The massive scale of global diesel consumption dwarfs currently available feedstock for biodiesel production.

According to the International Energy Agency (IEA), in 2005 the world road transport sector used 1473Mt of fuel – 872Mt of petrol and 601Mt of diesel. Europe alone used 173Mt of diesel.<sup>296</sup>

Biofuels have a relatively low value compared to many other vegetable oil products. Therefore, biodiesel is generally made from the cheapest of the bulk oil crops: soya, palm or rapeseed.

According to the United States Department of Agriculture (USDA), in 2005/6 global vegetable oil production from soya, palm and rapeseed was 87.43Mt.<sup>297</sup> Soya and palm account for 80% of this in roughly equal proportions.<sup>298</sup>

This means that replacing just 10% of world diesel demand for road transport would require over 76%<sup>299</sup> of total current global soya, palm and rapeseed oil production (allowing for the fact that vegetable oil-based biodiesel has only about 90% of the energy content of mineral diesel).<sup>300</sup>

Supply for biofuels in Europe is being driven by EU targets for its use in transport fuels. In early 2007, the EU Summit endorsed a biofuels minimum target of 10% by 2020,<sup>301</sup> almost doubling the target of the 2003 biofuel directive of 5.75% by 2010.<sup>302</sup> The increased target is dependent on production being both 'cost effective' and 'sustainable'.<sup>303</sup>

Europe alone would require over a fifth<sup>304</sup> of current global production of the bulk vegetable oils to replace 10% of road transport diesel demand.<sup>305</sup>



## WHY IS PALM OIL PART OF THE MIX? NOT ENOUGH OIL TO GO ROUND

As an economic consultancy for the UK Government observes, there is not enough arable land available to meet EU biofuel targets through domestic production of crops such as rapeseed.<sup>306</sup>

Large volumes of imports are likely, either to make the biodiesel itself or to fill the deficit left for the food industry by the use of rapeseed oil in biodiesel. As Unilever admits in a factsheet on biofuels: 'Demand for biofuel feedstock has already reduced the availability of raw materials.'<sup>307</sup>

Palm is the most land-efficient vegetable oil crop – far more productive per hectare than either soya or rapeseed.<sup>308</sup>

According to one RSPO member company, there is not enough rapeseed available to meet EU targets.<sup>309</sup> Of the alternatives, 'vegetable oil sourced from palm oil is among the most widely and commercially available'.<sup>310</sup> The company predicts demand growth for biodiesel of 52Mt between 2005 and 2030 in the EU alone as road transport fuel demand continues to rise.<sup>311</sup>

Meeting this level of growth for vegetable oil through palm oil would mean more than 15 million hectares of mature oil palm plantation would need to be dedicated to meet EU demand. This is nearly three times the 2005 acreage in Indonesia under oil palm.<sup>312</sup>

Certainly, demand for palm oil as a feedstock is set to grow significantly. According to the OECD, over the next decade to 2016: 'The nurturing of biodiesel production capacity will stimulate oilseed demand in the EU which, when combined with the growing demand for oilseed and palm oil for food use, will almost double EU imports of vegetable oils.'<sup>313</sup>

Today, palm oil is the most significant vegetable oil in the world, with 30% of world edible oil production in 2006/7.<sup>314</sup>

Estimates of increasing global production of the bulk vegetable oils and palm oil vary;<sup>315</sup> but the OECD-FAO Agricultural Outlook for 2006–2016 predicts that palm oil alone will account for nearly half the increased volume, close to 15Mt.<sup>316</sup>

This expansion in oil palm plantations is likely to take place in Indonesia. According to one RSPO member, a Malaysian government-owned palm oil producer: 'Indonesia is the preferred destination for many Malaysian plantation companies to increase their plantation size as much of the most sought-

after and fertile plantation land in Malaysia is already planted.'<sup>317</sup>

Already, the big commodity traders and energy companies are empire building – setting up joint ventures, laying claim to huge swathes of Indonesia's remaining forest, scrambling to claim status as the world's largest biodiesel producer.

Once this infrastructure is up and running, it will feed off forest destruction, fuelling not just our cars but also climate change.

The relentless spread of bulk commodity crops such as soya and palm has already taken its toll on soil, water and rainforests globally.<sup>318</sup> Expanding use of these crops will inevitably lead to further land conversion and further demands on already depleted natural resources, and will seriously exacerbate climate change.

## LAYING THE FOUNDATIONS FOR FOREST DESTRUCTION

The ADM-Kuok-Wilmar alliance is a case in point, recently announcing 'rapid expansion plans' in relation to biodiesel.<sup>319</sup> One subsidiary, PT Wilmar Bio-Energi, commissioned its first biodiesel plant in Dumai, Riau in January 2007 and two more facilities were scheduled to be commissioned later in 2007.<sup>320</sup> Total capacity is 1.05Mt. Wilmar boasts that the location of the plants 'provides easy access to abundant cheap raw materials'.<sup>321</sup> At the same time, between early 2006 and mid-2007, the ADM-Kuok-Wilmar alliance has made a fivefold increase in its concession area, gaining control of 570,000 hectares, of which nearly two-thirds have yet to be cleared and planted.<sup>322</sup>

In line with Indonesian law, Wilmar declared that its companies 'adhere strictly to a zero burning policy and do not engage in any logging activities'.<sup>323</sup> Field investigation in July 2007 in Wilmar's recently acquired holdings in Central Kalimantan documented active and recent evidence of forest clearance.<sup>324</sup>

'The bulk of Wilmar's biodiesel capacity for FY 2007 has been pre-sold to buyers in Europe and the USA.'<sup>325</sup>

Currently diesel represents about 60% of road transport fuel consumed within Europe.<sup>326</sup> In 2005, Europe's diesel consumption was 173Mt.<sup>327</sup> Were all of PT Wilmar Bio-Energi's forecast biodiesel production (1.05Mt) dedicated to meeting EU biofuel demand, it would only meet 0.5% of 2005 demand for diesel.<sup>328</sup> This production from Wilmar's biodiesel refineries will rely on harvests from almost 300,000 hectares of mature oil palm plantation.<sup>329</sup>



## WHO IS DRIVING DEMAND FOR PALM OIL? CARGILL AS BACKSEAT DRIVER FOR PALM OIL GROWTH ON ALL FRONTS

According to one RSPO member, conventional diesel used in the UK now already uses a typical blend of 5% biodiesel.<sup>330</sup>

However, an alliance between Cargill and Greenergy Biofuels Ltd<sup>331</sup> is selling fuel blends of 20%, 30% or 50% biodiesel,<sup>332</sup> which use palm oil, soya and rapeseed oil as feedstocks.<sup>333</sup> The website champions palm oil as a source: 'To ignore these tropical sources of biofuel [...] would significantly impact the world's ability to cut carbon emissions through biofuel usage.'<sup>334</sup>

The Cargill-Greenergy alliance currently controls half of the UK biofuels market. Customers include oil companies and major supermarkets like Tesco, as well as bus companies, road hauliers and train companies.<sup>335</sup> According to one of its customers and shareholders – also an RSPO member – the company sources its palm oil 'from RSPO members in Indonesia and Malaysia.'<sup>336</sup>

By the end of 2007, Cargill-Greenergy plans to double its UK biodiesel capacity to 200,000 tonnes per year.<sup>337</sup> It also has substantial biodiesel blending facilities in the port of Rotterdam,<sup>338</sup> from where it ships biodiesel blends to customers across Europe.<sup>339</sup>

Despite these expansion plans, the alliance is quick to point the finger for palm oil expansion at others, declaring: 'The main driver of palm oil demand is food industry and population growth.'<sup>340</sup> This fits rather oddly with Cargill's own statement to a UK Government committee: 'Our biodiesel investments are additional to and not at the expense of our food business and we recognise the paradox of managing both food and fuel supplies out of the same raw materials.'<sup>341</sup>

## WHAT DRIVES A LOW-CARBON ECONOMY? ENERGY EFFICIENCY, NOT EMISSIONS TRANSFER

EU biofuel targets must have strong sustainability safeguards if they are to prevent rainforest destruction and further GHG emissions. Ironically, however, in the desire to cut their own CO<sub>2</sub> emissions linked to transport and energy use, European governments are driving ecosystem destruction and are thereby responsible for vast and significant CO<sub>2</sub> emissions through forest burning and peat swamp drainage to plant oil

palm. CO<sub>2</sub> emissions from conversion of peat swamp forest to oil palm plantations are far greater than any gains from substitution of fossil fuels with palm oil.<sup>342</sup>

Use of biofuels linked to deforestation does not reduce GHG emissions – it simply transfers emissions from the biofuel consumer to the producer country.

This is not a realistic basis for tackling climate change. As an article published in *Science* in August 2007 makes clear: 'Policy-makers may be better advised in the short term (30 years or so) to focus on increasing the efficiency of fossil fuel use, to conserve the existing forests and savannahs, and to restore natural forest and grassland habitats on cropland that is not needed for food.'<sup>343</sup>

However, rather than focusing on efficient use of fossil fuel and drastic reductions in consumption, projections point in the opposite direction. The impact of cars on climate change is growing worse instead of better: more people are driving, cars are getting bigger, and CO<sub>2</sub> emissions are increasing. Indeed, under a business-as-usual scenario, by 2020 road transport fuel consumption is on track to have risen more than 10%.<sup>344</sup>

Addressing rising consumption through biofuel imports is not an answer, as the European Commission recognises: 'Increased use of biofuels in the EU will be accompanied by an increased external demand for biofuels and their feedstocks [...] There are substantial CO<sub>2</sub> losses if grassland is ploughed up or forest cleared. These losses can be expected to outweigh CO<sub>2</sub> gains from biofuels for many years.'<sup>345</sup> This resonates with the findings of Renton Righelato of the World Land Trust and Dominick Spracklen from the University of Leeds on the impacts of deforestation for biofuel production. They report in the journal *Science* that between two and nine times more carbon emissions are avoided by trapping carbon in trees and forest soil than by replacing fossil fuels with biofuels: 'Taking this opportunity cost into account, the emissions cost of liquid biofuels exceeds that of fossil fuels.'<sup>346</sup>

Viable approaches exist for reducing transport fossil fuel consumption that do not entail the disastrous side-effects of agricultural expansion into rainforests. These include increasing the fuel efficiency of vehicles (both through technological development and through the use of existing technologies); developing alternative and more environmentally benign power sources such as electricity from renewables; using fuel more efficiently within the public transport system; and reducing the number and length of journeys taken.

In addition, while domestic production of biomass and use of waste undoubtedly has a critical role to play, use of these resources to drive cars rather than heat and power our homes may be inefficient. A report for the UK Government observes: 'When looking at opportunities to reduce CO<sub>2</sub> emissions from fuels, it is important to understand the linkages with other sectors. In particular, road transport must compete for scarce primary energy sources with other sectors, including power generation, animal feed, and food. The challenge is therefore to ensure that low-carbon energy sources are put to the most efficient, effective, environmentally responsible and socially just use.'<sup>347</sup>

## TODAY'S EMPIRE BUILDING, TOMORROW'S DOWNFALL

Many other countries from oil dependent regions are following Europe's example and turning to biofuels from Indonesia's rainforests. The Chinese Government expects that by 2020 biofuel will account for 15% of transport fuel.<sup>348</sup> India has set a target of 20% of diesel from biofuels by 2012.<sup>349</sup> Already, China and India are the most significant palm oil consumers in the world, using about 25% of palm oil production.<sup>350</sup>

China and other developing countries in Asia are seeing rapid growth of road transport. Car ownership in China has doubled in the last five years and it already has the third highest car sales in the world.<sup>351</sup> By 2030, predictions by Goldman Sachs are that India and China will have 400 million cars – three times the number the USA had in 2000. By 2050, these two countries are on track to have 1.1 billion cars, nearly double the total global number of cars in 2000.<sup>352</sup>

That means a lot of land dedicated to biofuel production. The

Chinese government is already thinking ahead and turning its eyes to the region of Papua – the last great expanse of rainforest in Southeast Asia.

At the beginning of 2007, a strategic partnership of China National Offshore Oil Corporation (CNOOC),<sup>353</sup> Hong Kong Energy (HKE) and PT Smart, a subsidiary of RSPO member Sinar Mas engaged in a US\$5.5 billion venture to develop what could be the world's largest oil palm and biofuel project to date, covering 1 million hectares of plantations in Papua and Kalimantan.<sup>354</sup>

Third largest company in the world<sup>355</sup> and a member of the RSPO,<sup>356</sup> HSBC has a specific policy not to provide financial services to companies involved in 'projects located in and which significantly degrade or convert Critical Natural Habitats' including rainforests.<sup>357</sup> HSBC is a principle banker for the parent holding company for HKE.<sup>358</sup> HSBC also holds up to a quarter of shares in one Sinar Mas subsidiary.<sup>359</sup>

Documents obtained by Greenpeace<sup>360</sup> indicate that RSPO member Sinar Mas has plans far beyond this million hectare project. The internal company presentation shows that the Sinar Mas has mapped out plans to gain control of up to 2.8 million hectares of rainforest in Papua. Because, by Indonesian law, a single company cannot control more than 200,000 hectares of plantations in Papua,<sup>361</sup> Sinar Mas has already formed 14 subsidiaries.<sup>362</sup>

Planned facilities include a 7Mt/year crude palm oil refinery, a 5Mt/year biodiesel plant and bulk-handling terminals.<sup>363</sup>

To achieve this landgrab, according to investigations by a Singapore-based journalist, throughout 2007 Sinar Mas has been surveying plantation sites and wooing the local bureaucracy.<sup>364</sup>



sinar mas



香港通訊

HSBC



*'The draining of wetlands to produce any type of biofuel would produce a loss of stored carbon that would take hundreds of years to make up through the biofuels' annual greenhouse gas savings.'*

European Commission, 2007

## WHO ELSE IS GRABBING LAND AND SETTING UP INFRASTRUCTURE?

The Indonesian government is currently planning to expand biofuel production through 7 million hectares of dedicated plantation by 2015, including 4 million hectares of oil palm and 3 million of jatropha.<sup>365</sup>

At the beginning of 2007, 67 contracts committing to biofuel development were signed by industry and the Indonesian government.<sup>366</sup>

In addition to Sinar Mas' ambitious biodiesel project, Greenpeace estimates that current plans for biodiesel refineries will create additional capacity for biodiesel production within Indonesia in the region of 4Mt a year.<sup>367</sup> Between Sinar Mas and these other players, therefore, over 2.5 million hectares of land will be dedicated to biofuel production.<sup>368</sup>

Where will they go?

Indonesia's Ministry of Forestry has already earmarked up to 9 million hectares of forests in Papua for conversion.<sup>369</sup> Companies also already hold significant forested landbanks that have yet to be cleared. For instance, Sinar Mas has an undeveloped landbank of 200,000 hectares.<sup>370</sup>

## EMISSIONS EXPLOSION – DUTA PALMA'S SMOKING GUN

***'The carbon sequestered by restoring forests is greater than the emissions avoided by the use of the liquid biofuels.'***<sup>371</sup>

Science 17 August 2007

As noted above, the Duta Palma group is one of Indonesia's ten largest palm oil refiners<sup>372</sup> and a member of the RSPO. One of Duta Palma's subsidiaries<sup>373</sup> is constructing a biofuel refinery with a capacity of 200,000 tonnes a year.<sup>374</sup>

Duta Palma is rapidly expanding its landbank and rapidly deforesting existing concession areas, some on deep peat over 2 metres deep.

According to the maps compiled by Wetlands International, which form the basis for Riau's current land use plan,

the peatlands within the three Duta Palma concessions investigated by Greenpeace cover a total area of 14,850 hectares. Over 90% of this (14,190 hectare) is marked as 2–4 metres deep.<sup>375</sup>

Drainage and fires on these peatlands puts substantial carbon stores at risk.

Assuming an average depth of 3 metres, these peatlands store about 25.5Mt of carbon.<sup>376</sup>

Were this volume of carbon released to the atmosphere, it would be equal to 2% of the annual global GHG emissions from road transport,<sup>377</sup> or on a par with the annual GHG emissions of the UK's ten most inefficient coal power stations.<sup>378</sup> The area in question is tiny: 0.0001% of global land area<sup>379</sup> – about one-tenth the size of the city of Jakarta,<sup>380</sup> or two-and-a-half times the size of Manhattan Island, New York.<sup>381</sup>

Greenpeace's measurement of peat depths and visual observation of peat depths elsewhere (eg drainage canals) shows that substantial areas of these concessions are on very deep peat – in places greater than 8 metres depth – suggesting that the carbon store at risk is far greater.

The more we allow conversion of peat, the more GHG emissions the world will be burdened with. How many more areas have been allocated to oil palm concessions with peat far deeper than maps would indicate?

## WHAT DOES ALL THIS MEAN?

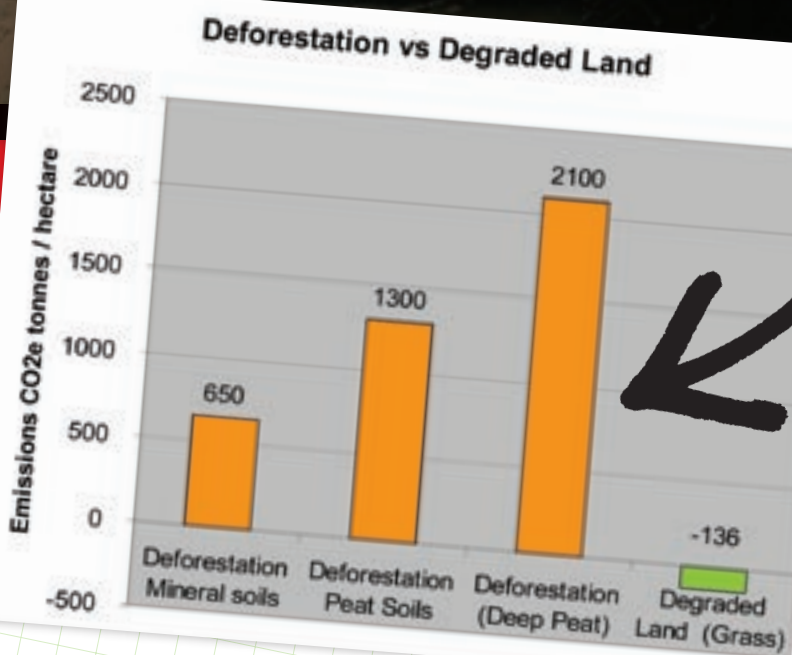
Duta Palma is just one example of an RSPO company driving palm oil expansion and peat degradation that is involved in biodiesel.

Growing global demand for vegetable oil for food combined with current landgrabbing by biofuel interests – many of them RSPO members – is significantly increasing the pressure on the world's threatened rainforests and other vulnerable habitats. Continuing clearance of tropical rainforests seems inevitable unless action is taken now. Biofuel production from oil palm expansion – presented as a solution to climate change – spells disaster for the climate.

An end to deforestation is the only solution.

*'The loss of natural forests around the world contributes more to emissions than the global transport sector and therefore it is important to ensure that increased biofuel demand does not exacerbate this problem.'*

2007 King Review for the UK Government Treasury



Germer J and J Sauerborn (2007)  
'Estimation of the impact of oil palm  
plantation establishment on greenhouse  
gas balance' *Environ Dev Sustain* DOI  
10.1007/s10668-006-9080-1



## DEFUSE OR DETONATE?

NASA climate scientists warn us that 'continued rapid growth of CO<sub>2</sub> emissions and infrastructure for another decade' may make halting high-risk increase in global temperatures 'impractical if not impossible'.<sup>382</sup>

Developing countries with tropical rainforests – such as Indonesia and Brazil – do not have targets for emissions reductions under the Kyoto Protocol. There is no international financing mechanism to support them in reducing their emissions from deforestation, although countries that are signatories to the UN Convention on Climate Change have made a general commitment to protect and conserve the world's carbon reservoirs.<sup>383</sup>

While international climate negotiations in 2007 are opening discussions on ways to reduce emissions from deforestation, global commodity traders continue to expand commodity infrastructure into the world's rainforests. Once such infrastructure is in place, stopping the 'rapid growth of CO<sub>2</sub> emissions' linked to rainforest destruction becomes 'impractical if not impossible'.

Faced with impending climate catastrophe, the palm oil industry is speculating on the predicted growth in global demand for vegetable oil by grabbing valuable, available cheap land – ie Indonesia's carbon-rich peatland and rainforest – and building infrastructure, including palm oil refineries and biodiesel plants.

By maintaining a business-as-usual relationship with commodity traders, the big food giants like Unilever and Nestlé are supporting the 'rapid growth of CO<sub>2</sub> emissions and infrastructure' that may render halting dangerous climate change 'impractical if not impossible'.

Just as perverse are political strategies for reducing emissions from transport. National energy policies and current emissions accounting incentivise this infrastructure development.

*'The simplest and most effective measure to prevent a further increase in fires and CO<sub>2</sub> emissions is thus by conservation of remaining peat swamp forests and rehabilitation of degraded peat swamp forests.'*

**Wetlands International, 2006**

In an effort to reduce their own emissions, oil dependent countries are striking deals with oil palm companies in Indonesia – for instance, Sinar Mas' partnership with the Chinese National Offshore Oil Corporation. This trade amounts to emissions transfer not emissions reduction: emissions linked to palm oil production, such as forest clearance and peatland destruction, are attributed to the producer country. Unlike Annex I signatories to the Kyoto treaty, Indonesia – as a developing country – is not required to set a target to reduce its GHG emissions.

Consequently, since the Kyoto Protocol does not provide incentives to prevent the destruction of tropical forests, the expansion of oil palm into carbon-rich landscapes such as peatlands and forests makes huge short-term economic sense, but no ecological sense.

Urgent action and cooperation is needed on a global level to shift the economic drivers of society. As NASA's climate scientists observe: 'The task is to achieve a transition to clean carbon-free energy sources without pushing the climate system beyond a level where disastrous irreversible effects become inevitable.'<sup>384</sup>

The debate is not whether we need to reduce emissions from fossil fuels in the industrialised world or whether we should stop deforestation in the remaining forests of the developing world. The inescapable reality is that we must do both, and soon.

At the same time, growing global demand for vegetable oil for food combined with current landgrabbing by biofuel interests – many of them RSPO members – is significantly increasing the pressure on the world's threatened rainforests and other vulnerable habitats. Continuing clearance of tropical rainforests for agricultural commodity crops like oil palm seems inevitable unless action is taken now by industry and governments.

## MAKING BIG EMISSIONS CUTS FAST: HALTING DEFORESTATION

***'Activities in forestry are the largest contributor to emissions of greenhouse gases in Indonesia. It is time we put together all of our resources to prevent forest fires and irresponsible deforestation. We need to be united in this effort because the potential dangers of climate change are too great to ignore'***<sup>385</sup>

**World Bank/ UK Government funded report, 2007**

Forest destruction is responsible for about one fifth of global GHG emissions. Destruction of Indonesia's peatlands alone accounts for 4% of global annual GHG. Curbing tropical deforestation is one of the quickest, most effective ways to cut GHG emissions.

Where can big emissions be cut quickly and cost effectively?

### **Cut one: Cut global deforestation: annual emissions savings – up to 2Gt CO<sub>2</sub>**

According to an IPCC report, up to 2Gt CO<sub>2</sub> (equivalent of up to 4% of current annual GHG emissions) can be cut cost effectively. The report puts the cost for making these emissions savings at up to \$100/tonne CO<sub>2</sub>.<sup>386</sup>

Significantly, this figure does not include potential to halt emissions from peatland and other bog fires.<sup>387</sup>

### **Cut two: Stop Indonesian peatland fires, establish a moratorium on peatland conversion: annual emissions savings – 1.3Gt CO<sub>2</sub>**

The emissions from Indonesia's peatland fires largely represent new expansion and peatland clearance. The best way to avoid these emissions is to stop further conversion of peat swamp forests. Since use of fire for forest or agricultural clearance is illegal, as is degradation of deep peat, the only cost is that of law enforcement and improved governance.

### **Cut three: Rehabilitate Indonesia's degraded peatlands: annual emissions savings – 0.5Gt CO<sub>2</sub>**

Avoiding ongoing emissions from Indonesia's degraded peatlands poses a cost effective opportunity to make rapid emissions reductions. The area involved is miniscule – about 10 million hectares or less than 0.1% of the earth's land surface. One project being pursued by Wetlands International aims to restore 43,500 hectares of degraded peatlands in Central Kalimantan, avoiding the emission of 3.4Mt of CO<sub>2</sub> a year, for a one-off investment of about \$720,000 (this equates to \$0.22/tonne).<sup>388</sup> This is small change in global climate change terms.

### **Total cuts: Potential annual emissions savings: up to 3.8Gt CO<sub>2</sub>. This equates to nearly 8% of current annual GHG emissions.**



## TIME FOR ACTION:

***'A moratorium will be a strong signal. [It] can be a first step in countering peatland degradation [,] to buy time to maximize the new opportunity of carbon finance. A moratorium needs to be part of a longer-term strategy of land use planning.'***<sup>389</sup>

**Yogyakarta statement, endorsed by the Indonesian Minister of the Environment, August 2007**

Protecting the world's remaining forests is crucial to efforts to stabilise the climate, to preserve global biodiversity and to ensure the livelihoods of millions of people who depend on forests.

Forest destruction is responsible for about one fifth of global GHG emissions – Indonesia and the Amazon are by far the two largest sources of GHG emissions. Emissions from Indonesia's degraded peatlands represent 4% of global GHG emissions, but the area of degraded peatlands involved is relatively small – about 10 million hectares or less than 0.1% of the earth's land surface.

If we are to prevent dangerous global climate change, we need a global effort to halt forest destruction as well as bringing about a drastic reduction in our use of coal, oil and gas by using energy more efficiently and utilising cleaner sources of energy.

In order to help protect the climate, Greenpeace is calling for an end to deforestation in Indonesia and the Amazon rainforest – by far the two largest sources of GHG emissions from deforestation.



## WHAT DOES THE INDONESIAN GOVERNMENT NEED TO DO?

### **STOP THE PROBLEM: ZERO DEFORESTATION**

Establish a moratorium on forest clearance and peatland degradation.

### **START THE SOLUTION: CLIMATE PROTECTION**

Prioritise protection of remaining peat swamp forests and other forest areas with high carbon storage capacity, biodiversity values and benefits for indigenous peoples and other local communities.

### **START THE SOLUTION: CUT ONGOING EMISSIONS**

Rehabilitate degraded peatland areas with natural and native flora.



## WHAT DOES THE INDUSTRY NEED TO DO?

### STOP THE PROBLEM: SUPPORT ZERO DEFORESTATION

Support a moratorium on forest clearance and peatland degradation.

### START THE SOLUTION: CLEAN UP THE TRADE

Do not trade with those engaged in deforestation and peatland degradation.

Inform suppliers that purchasers will no longer buy from companies engaged in forest conversion and peatland degradation.



## WHAT DO OTHER GOVERNMENTS NEED TO DO?

### STOP THE PROBLEM: REDUCE EMISSIONS FROM DEFORESTATION

Countries should take immediate action to reduce their emissions from deforestation and consumption of and trade in products coming from the destruction of the world's remaining forests.

Devise strict sustainability criteria to ensure all supportive government policies for biomass or biofuels, such as subsidies, tax exemptions and targets do not include products directly or indirectly responsible for deforestation.

### START THE SOLUTION: FUND CLIMATE PROTECTION

Agree a global funding mechanism to reduce emissions from deforestation and make this a central part of the next phase of the Kyoto Protocol (post-2012) agreement on climate change.<sup>390</sup>

Make available international funds to help countries take immediate action to reduce their emissions from deforestation: agree a global funding mechanism to transfer money from rich to poor countries for forest protection.





## ENDNOTES

- 1 Hooijer et al (2006): 29
- 2 There are 27.1 million hectares of peatlands in SE Asia, 83% of this is in Indonesia. 10.6 million hectares (39%) of peatland in SE Asia was deforested in 2000. Accounting for continued deforestation at a rate of 1.5%/year, the deforested peatland area in 2006 is around 45% of total peatland area, or 12.1 million hectares. 83% of 12.1 = 10 million hectares of peatland deforested and degraded. Source: Hooijer et al (2006): 9, Wetlands International (2006a, 2006b). CIA (2007) gives global land area as 15 billion hectares. So Indonesia's degraded peatlands equal 0.07% of the earth's land surface.
- 3 0.5Gt carbon, or 1.8Gt CO<sub>2</sub>. Santilli et al (2005): 2 'Table 1, Carbon emissions from fossil fuel, tropical deforestation, forest fires (Brazil and Indonesia), fires and emission reductions targeted by the Kyoto Protocol'
- 4 **4,043,601 hectares. Wahyunto et al (2003): 34**
- 5 Land areas of Taiwan and Switzerland are 3.5 and 4 million hectares respectively. CIA (2007)
- 6 14.6Gt of carbon. Wahyunto et al (2003): 34
- 7 based on emissions of 10.18Gt CO<sub>2</sub> from fossil-fuel power stations in 2004. IPCC WGIII (2007) 104 'Figure 1.2: Sources of global CO<sub>2</sub> emissions, 1970-2004 (only direct emissions by sector)'
- 8 1.4 million hectares. IPOC (2006)
- 9 Colchester et al (2006): 25 citing Forest Peoples' Programme and Sawit Watch (2006)
- 10 RSPO (2007b)
- 11 Adam Harrison, WWF, letter to Greenpeace, 19 October 2007
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- 17 IPCC WGII (2007): 11
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- 20 IPCC WGII (2007):44 Technical Summary: Box TS.5. 'The main projected impacts for systems and sectors'; IPCC WGI (2007): 543-544
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- 46 Hooijer et al (2006): 29
- 47 IPCC WGIII (2007): 3
- 48 Based on emissions from deforestation of 8.52 billion tonnes. IPCC WGIII (2007): 104 'Figure 1.2: Sources of global CO<sub>2</sub> emissions, 1970-2004 (only direct emissions by sector)'. Indonesia's peatland emissions are 1.8Gt/year. Hooijer et al (2006): 29. There are 27.1 million hectares of peatlands in SE Asia, 83% of this is in Indonesia. 10.6 million hectares (39%) of peatland in SE Asia was deforested in 2000. Accounting for continued deforestation at a rate of 1.5%/year, the deforested peatland area in 2006 is around 45% of total peatland area, or 12.1 million hectares. 83% of 12.1 = 10 million of peatland deforested and degraded. Source: Hooijer et al (2006): 9, Wetlands International (2006a, 2006b). CIA (2007) gives global land area as 15 billion hectares. So Indonesia's degraded peatlands equal 0.07% of the earth's land surface.
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- 50 Hooijer et al: 17
- 51 There are 27.1 million hectares of peatlands in SE Asia, 83% of this is in Indonesia. 10.6 million hectares (39%) of peatland in SE Asia was deforested in 2000. Accounting for continued deforestation at a rate of 1.5%/year, the deforested peatland area in 2006 is around 45% of total peatland area, or 12.1 million hectares. 83% of 12.1 = 10 million of peatland deforested and degraded. Source: Hooijer et al (2006): 9, Wetlands International (2006a, 2006b). CIA (2007) gives global land area as 15 billion hectares.
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- 55 based on emissions of 10.18Gt CO<sub>2</sub> from fossil-fuel power stations in 2004. Source: IPCC WGIII (2007) 104. 'Figure 1.2: Sources of global CO<sub>2</sub> emissions, 1970-2004 (only direct emissions by sector)'
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- 61 UNEP (2002)
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- 90 Uryu et al (2007): 3-8
- 91 Uryu et al (2007): 3-8, and Wahyunto et al (2003)
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- 93 IPOC (2006)
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- 97 WWF (2001)
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- 100 Annual deforestation rate at 1.87 million hectares a year. FAO (2005): 157 Table 4
- 101 Suharto (2007); FAO (2005)
- 102 Friends of the Earth (2004) citing Sawit Watch (2002)
- 103 37.7% Source: Hooijer et al (2006): 14 Figure 10
- 104 Decree of Minister of Forestry and Plantation Number 376/1998, dated 8 April 1998. Decree no 376/1998 issued by the Ministry of Forestry and Plantations, 8 April 1998, gives criteria for choosing areas for oil palm plantations: 'plantation developments on peat soils deeper than two metres are not allowed'
- 105 Presidential Decree No. 32/1990, source: Walhi et al (2006). Presidential decree no 32/1990 on 'Management of Protected Areas' 25 July 1990: Article 10 specifies that 'upstream swamp and peatlands deeper than 3 metres should be protected'.
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- 107 Credit Suisse (2006)
- 108 Greenpeace investigations June-October 2007
- 109 Duta Palma, 'Dutapalma Nusantara and Subsidiaries' [www.dutapalma.co.id/plant.htm](http://www.dutapalma.co.id/plant.htm) accessed 29/10/07
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- 111 Until February 2007, the relevant legislation was Ministry of Agriculture Decree "Guidance for Plantation Permits (Pedoman Perizinan Usaha Perkebunan)" No 357/Ktps/HK.350/5/2002 of 23 May 2002, article 7 sentence 1a "For 1 company or company group, maximum total area is 20,000 ha in one province or 100,000 ha for the whole of Indonesia (nationality)" The regulation was revised in February 2007: Ministry of Agricultural Decree "Guidance for Plantation Permits (Pedoman Perizinan Usaha Perkebunan)" No 26/Permentan/OT.140/2/2007 of 28 February 2007, article 12 sentence 1 "maximum total area for 1 company is 100,000 ha", article 12 sentence 3 "maximum total area for 1 company in Papua is 2 x 100,000 ha"
- 112 PT Kencana Amal Tani (8,766ha), PT Banyu Bening Utama (5,477ha), PT Bertuah Aneka Yasa (9,960ha), PT Mekar Sari Alam Lestari (15,416ha), PT Palma Satu (15,505ha)
- 113 Decree no 376/1998 issued by the Ministry of Forestry and Plantations, 8 April 1998, gives criteria for choosing areas for oil palm plantations: 'plantation developments on peat soils deeper than two metres are not allowed'; Presidential decree no 32/1990 on 'Management of Protected Areas' 25 July 1990: Article 10 specifies that 'upstream swamp and peatlands deeper than 3 metres should be protected'.
- 114 Greenpeace has obtained a document – an environmental impact assessment (EIA), part of the initial stages of applying for a concession title – including a map, for an area adjacent to Duta Palma's known existing operations. The new company filing this EIA, PT Palma Satu, has the same logo as Duta Palma and is owned by Cheryl Darmadi, the daughter of Duta Palma owner Surya Darmadi. In 2007 (after much clearing had already taken place), the company obtained an in principle agreement from the local district head to establish a palm oil plantation on this area. However, no concession rights have been granted for conversion of this 14,000 hectare area.
- 115 Wahyunto et al (2003); large parts of PT BBU, PT Palma Satu and PT BAY are marked as being on 2-4 metre deep peat, while PT KAT is on mineral soil.
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- 123 RSPO (2007b)
- 124 Adam Harrison, WWF, letter to Greenpeace, 19 October 2007
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- 126 Unilever, 'Annual report 2005' [www.unilever.com/Images/ir\\_2005\\_About\\_Unilever\\_tcm13-35723.pdf](http://www.unilever.com/Images/ir_2005_About_Unilever_tcm13-35723.pdf)
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- 128 Stern (2006)
- 129 Eg CalorieLab <http://calorielab.com/restaurants/ben-and-jerrys/marsha-marshamallow/255/21259>; Flora [www.florapro-activ.com.au/245\\_250.htm](http://www.florapro-activ.com.au/245_250.htm); Ocado, Product Information, Knorr Stock Cubes [www.ocado.co.uk/webshop/getProductDetails.do?parentContainer=RECIPE&sku=11115011](http://www.ocado.co.uk/webshop/getProductDetails.do?parentContainer=RECIPE&sku=11115011); Unilever Product Information [www.unilever.com/PIOTI/EN/p3.asp?selectCountry=UK&language=EN&brandid=DOVE](http://www.unilever.com/PIOTI/EN/p3.asp?selectCountry=UK&language=EN&brandid=DOVE); Unilever Product Information [www.unilever.com/PIOTI/EN/p3.asp?select](http://www.unilever.com/PIOTI/EN/p3.asp?select)

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- 134 Clay (2005)
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- 193 Golden Agri Resources (2007)
- 194 Sizes of concessions listed are those based on spatial analysis of the maps attached to the permits of the respective concessions.
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- 196 PT Ivo Mas Tunggal (14,864ha; 9,860ha,

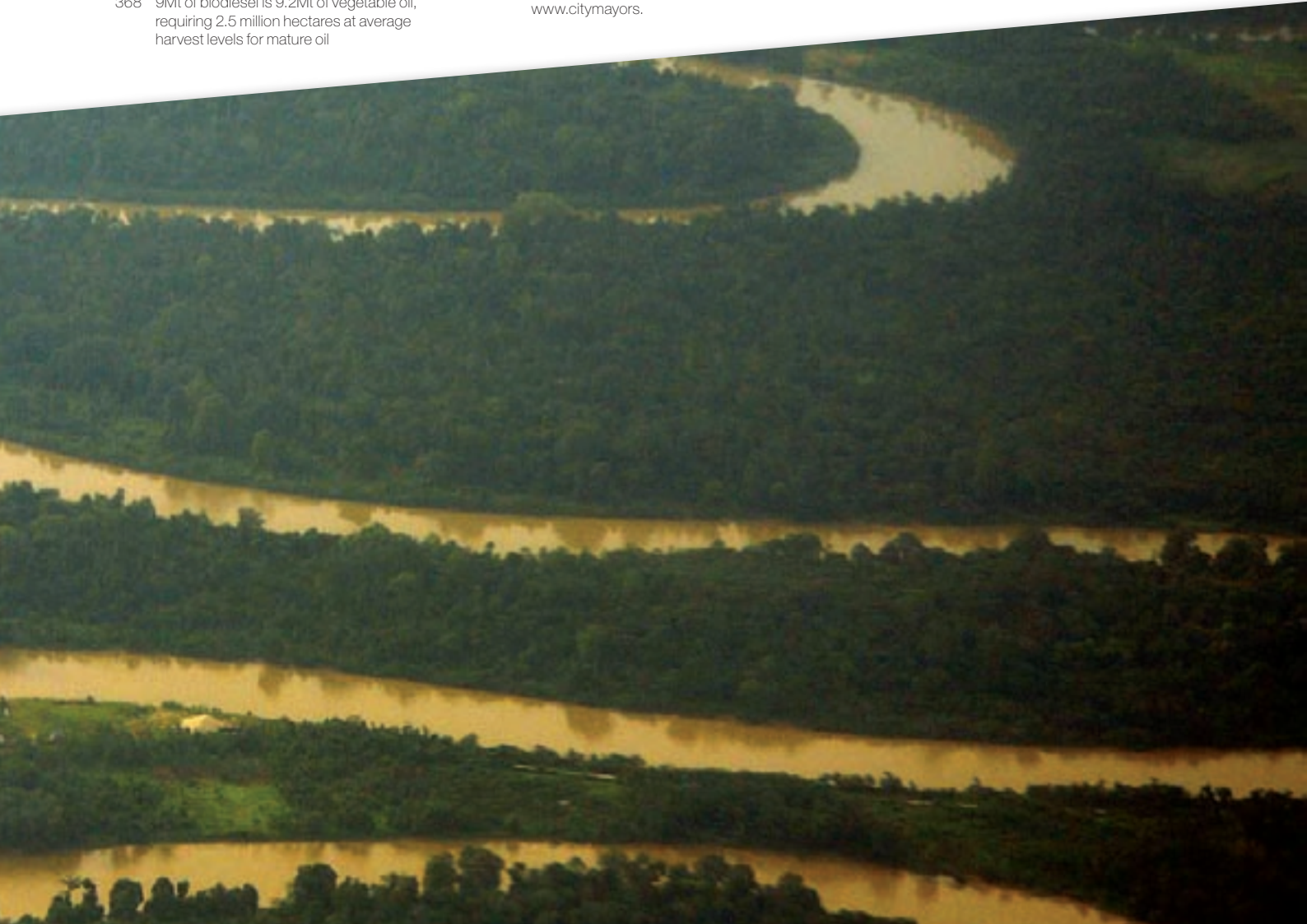
- 12,789ha, 2,384ha, 12,195ha); PT Bumi Plasma Lestari (10,555ha); PT Mega Nusa Inti Sawit (5,926ha, 8,389ha)
- 197 **PT Ivo Mas Tunggal (14,864ha; 9,860ha, 12,789ha, 2,384ha);** PT Bumi Plasma Lestari (10,555ha); PT Mega Nusa Inti Sawit (5,926ha)
- 198 **PT Buana Wira Lestari (10,465ha) – 2005;** PT Ramajaya Pramukti (8,785 ha) – 2005; PT Bumi Plasma Lestari (10,554ha) – 2005, 2006, 2007; PT Mega Nusa Inti Sawit (8,389ha) – 2006, 2007 – and (5,925ha) – 2006, 2007
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- 202 PT Murini Samsam (3,726ha); PT Jatim Jaya Perkasa (21,212ha), PT Darma Wungu Guna (4,374ha)
- 203 **PT Jatim Jaya Perkasa (21,212ha),** PT Citri Riau Sarana (20,395ha), PT Darma Wungu Guna (4,374 ha)
- 204 **PT Murini Samsam (3,726ha, 1,463);** PT Jatim Jaya Perkasa (21,212ha), PT Citri Riau Sarana (20,395ha)
- 205 PT Jatim Jaya Perkasa (21,212ha) – 2005, 2006, 2007; PT Citri Riau Sarana (20,395ha) - 2005, PT Murini Samsam (3,726ha) - 2005, 2006, 2007, PT Darma Wungu Guna (4,374ha) - 2005, 2006, 2007
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- 207 Sizes of concessions listed are those based on spatial analysis of the maps attached to the permits of the respective concessions.
- 208 **PT Kimia Tirta Utama (8,670ha),** PT Ekadura Indonesia (12,035ha)
- 209 **PT Ekadura Indonesia (70,796ha),** Sari Lembah Subur (20,504ha), PT Tunggal Perkasa (17,398ha), PT Sawit Asahan Indah (7,724ha)
- 210 **PT Kimia Tirta Utama (8,670ha),** PT Ekadura Indonesia (12,035ha), Sari Lembah Subur (20,504ha), PT Tunggal Perkasa (17,398ha)
- 211 Fires on the mineral soils were in PT Ekadura Indonesia (10,796ha) – 2005, 2007; PT Sari Lembah Subur (20,504 ha) – 2006, 2007; PT Sawit Asahan Indah (7,724 ha) – 2005, 2006; fires in peatlands on PT Kimia Tirta Utama (8,670ha) – 2005, 2006 and PT Ekadura Indonesia (12,035ha) – 2005, 2006, 2007
- 212 van Gelder (2004)
- 213 Sizes of concessions listed are those based on spatial analysis of the maps attached to the permits of the respective concessions.
- 214 PT Gunung Mas Raya (8569 ha)
- 215 PT Gunung Mas Raya (8,569 ha, 5,446 ha), PT Indri Plant (1,482 ha)
- 216 PT Gunung Mas Raya (8569 ha, 5446 ha), PT Indri Plant (1482 ha)
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# ACRONYMS, TECHNICAL TERMS ETC.

\$ – Dollars (US)

Annex I Parties – Parties include the industrialised countries that were members of the OECD (Organisation for Economic Co-operation and Development) in 1992, plus countries with economies in transition (the EIT Parties), including the Russian Federation, the Baltic States, and several Central and Eastern European States.

bn – Billion

Carbon, CO<sub>2</sub> and CO<sub>2</sub> equivalent (CO<sub>2</sub>e) – Climate change potential may be measured in three sets of units depending on context: weights of carbon, of CO<sub>2</sub> and of CO<sub>2</sub> equivalent. In this report, weight of carbon is used when referring to stored carbon (eg tonnes of carbon per hectare in peatlands) and weight of CO<sub>2</sub> when referring to emissions. 1kg of carbon converts to 3.67kg CO<sub>2</sub> (this is directly equivalent to the difference in weight per carbon atom: carbon has an atomic weight of 12, CO<sub>2</sub> a molecular weight of 44 – one carbon atom plus two oxygen atoms). CO<sub>2</sub> equivalent (CO<sub>2</sub>e) is an expression of global warming potential which includes the effects of other greenhouse gases (such as methane and nitrous oxides) in terms of the weight of CO<sub>2</sub> required to produce the same effect.

CO<sub>2</sub> – Carbon dioxide

CPO – Crude Palm Oil

EU - European Union

EU15 – Fifteen member states of the European Union (all members who joined prior to 2004)

EU25 – Twenty-five member states of the EU 2004-2007

EU27 – Twenty seven member states of the European Union (including Bulgaria and Romania from 2007)

EU – RES-E directive – European Union Renewable Energy Sources for Electricity production directive

FAO – Food and Agriculture Organisation of the United Nations

GHG – Greenhouse gas

Gt – Gigatonnes (billion tonnes)

ha – Hectare(s)

IEA – International Energy Agency

Kyoto Protocol – The Kyoto Protocol, an international and legally binding agreement to reduce GHG emissions world wide, entered into force on 16 February 2005. This international agreement, which builds on the UNFCCC, sets legally binding targets and timetables for cutting the GHG emissions of industrialized countries.

Mt – Megatonnes (million tonnes)

NGO Non-governmental organisation

OECD - Organisation for Economic Cooperation and Development

PKO – Palm Kernel Oil

t – Tonnes

t/ha – Tonnes/hectare

UN – United Nations

UNFCCC – United Nations Framework Convention on Climate Change

USDA – United States Department of Agriculture



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*'Activities in forestry are the largest contributor to emissions of greenhouse gases in Indonesia. It is time we put together all of our resources to prevent forest fires and irresponsible deforestation. We need to be united in this effort because the potential dangers of climate change are too great to ignore.'*

**World Bank/ UK Government funded report, 2007**







# GREENPEACE

November 2007

Published by Greenpeace International  
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The Netherlands

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Greenpeace is an independent global campaigning organisation that acts to change attitudes and behaviour, to protect and conserve the environment and to promote peace.

Greenpeace is committed to stopping climate change.

We campaign to protect the world's remaining ancient forests and the plants, animals and peoples that depend on them.

We investigate, expose and confront the trade in products causing forest destruction and climate change.

We challenge governments and industry to end their role in forest destruction and climate change.

We support rights of forest peoples.

