HOW THE PALM OIL INDUSTRY IS COOKING THE CLIMATE
‘Climate change is market failure on the greatest scale the world has seen. It results from the fact that the costs of greenhouse gas emissions are not paid for by those who create the emissions.’

2007 King Review for the UK Government Treasury
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Uncontrollable fires in forests and peatlands during 1997 released up to 2.57 Gt of carbon, a volume equivalent to up to 40% of the mean annual global carbon emissions from fossil fuels during the period.

1997: HAZE OVER INDONESIA
Every year, 1.8 billion tonnes (Gt) of climate changing greenhouse gas (GHG) emissions are released by the degradation and burning of Indonesia’s peatlands – 4% of global GHG emissions from less than 0.1% of the land on earth.

This report shows how, through growing demand for palm oil, the world’s largest food, cosmetic and biofuel industries are driving the wholesale destruction of peatlands and rainforests. These companies include Unilever, Nestlé and Procter & Gamble, who between them account for a significant volume of global palm oil use, mainly from Indonesia and Malaysia.

Overlaying satellite imagery of forest fires with maps indicating the locations of the densest carbon stores in Indonesia, Greenpeace researchers have been able to pinpoint carbon ‘hotspots’. Our research has taken us to the Indonesian province of Riau on the island of Sumatra, to document the current activities of those involved in the expansion of palm oil. These are the producers who trade with Unilever, Nestlé and Procter & Gamble, as well as many of the other top names in the food, cosmetic and biofuel industries.

The area of peatland in Riau is tiny: just 4 million hectares, about the size of Taiwan or Switzerland. Yet Riau’s peatlands store 14.6Gt of carbon – if these peatlands were destroyed, the resulting GHG emissions would be equivalent to one year’s total global emissions.

Unless efforts are made to halt forest and peatland destruction, emissions from these peatlands may trigger a ‘climate bomb’.

FORESTS AS TICKING CLIMATE BOMBS

Forest ecosystems currently store about one and a half times as much carbon as is present in the atmosphere. Without drastic cuts in GHG emissions, climate change – which is in part driven by forest destruction – may soon tip these carbon stores into sources of emissions. Resulting temperature increase could disrupt ecosystems in ways that provoke yet more greenhouse emissions, potentially leading to further acceleration of climate change.

Conclusions from the world’s leading climate scientists in the Intergovernmental Panel on Climate Change (IPCC) show that large cuts in GHG emissions are needed rapidly. Time is desperately short. The greater the delay in realising emissions reductions, the higher the financial, social and ecological costs will be.

INDONESIA’S RAINFORESTS AND PEATLANDS IN THE POLITICAL SPOTLIGHT

Indonesia offers a critical example of why GHG emissions arising from deforestation and land-use change need to be dealt with at the international level, by governments and corporations.

Indonesia holds the global record for GHG emissions through deforestation, putting it third behind the USA and China in terms of total man-made GHG emissions. During the last 50 years, over 74 million hectares of Indonesia’s forests have been destroyed – logged, burned, degraded, pulped – and its products shipped round the planet.

Unlike industrialised country (Annex I) signatories to the Kyoto climate treaty, Indonesia – as a developing country – is not required to set a target to reduce its GHG emissions. Consequently, since the Kyoto Protocol provides no incentives for preventing the destruction of tropical forests, the expansion of palm oil into carbon-rich landscapes such as peatlands and rainforests makes short-term economic sense but no ecological sense.

In December 2007, negotiating teams from governments around the world will gather in Bali, Indonesia to thrash out an agreement that will ideally lead to an international plan to deliver deep cuts in global GHG emissions, as an extension of the current Kyoto climate treaty.

These climate negotiations are first steps toward international political measures to tackle deforestation. Meanwhile, global industry continues business-as-usual, and is expanding into the world’s rainforests.

PALM OIL’S BOOM!

NASA’s climate scientists warn that ‘continued rapid growth of CO₂ emissions and infrastructure for another decade’ may make halting high-risk increase in global temperatures ‘impractical if not impossible’.
A report published by the United Nations Environment Programme (UNEP), in 2007, acknowledges that palm oil plantations are now the leading cause of rainforest destruction in Malaysia and Indonesia.

Indonesia has destroyed over 28 million hectares of forest since 1990, largely in the name of land conversion for plantations. Yet the area of oil palm or pulp wood plantations established in this period was only 9 million hectares. This clearly implies that most of the companies obtained permits to convert the forest only to gain access to the timber. Rainforest continues to be destroyed for plantations because of the financial value of the timber.

Oil palm plantations feed a growing global demand for cheap vegetable oil used in the production of food, cosmetics and fuel. Compared to the year 2000, demand for palm oil is predicted to more than double by 2030 and to triple by 2050.

A handful of powerful players control much of the international trade in palm oil from Indonesia, among them Cargill, the world’s biggest private company, the ADM-Kuok-Wilmar alliance, currently the world’s biggest biofuels manufacturer and Synergy Drive, the Malaysian government controlled company that is soon to become the world’s biggest palm oil conglomerate.

Following business-as-usual logic, industry’s current expansion strategy – including taking advantage of concern about climate change to push palm oil as a source of biodiesel – casts an ominous shadow over our ability to cut emissions.

Much of the current and predicted expansion oil palm plantations is taking place on peatlands which are among the world’s most concentrated carbon stores. Ten million of the 22.5 million hectares of peatland in Indonesia have already been cleared of forest and have been drained, resulting in a substantial and continuing increase in GHG emissions as peat soils dry out, oxidise and even burn.

GHG emissions from peatlands are set to rise by at least 50% by 2030 if predicted expansion proceeds.

**RIAU: A LIT FUSE**

In early 2007, through satellite monitoring, Greenpeace identified fire hotspots in Riau Province.

Comparing and overlaying maps of peatlands and forest concessions signalled there was significant overlap between the location of fires, oil palm concessions and peatlands.

The peat soils of this once heavily forested province of 9 million hectares have the highest concentration of carbon stored per hectare of anywhere in the world. The area of peatland involved is small: just 4 million hectares – about the size of Taiwan or Switzerland. But they store 14.6Gt of carbon, or 40% of Indonesia’s peatland carbon.

Riau’s huge carbon store is at high risk from drainage, clearance and ultimately from fire. Destroying these peatlands could release GHG emissions equivalent to one year’s total global emissions or to five years’ emissions from all fossil-fuel power plants in the world.

A quarter of Indonesia’s oil palm plantations are located in Riau. By 2005, 1.4 million hectares of oil palm plantation had been established in the province. Data suggest that over one-third of oil palm concessions in Riau are sited on peat.

Riau is facing further expansion in palm oil due to its available infrastructure. A further 3 million hectares of peatland forests are earmarked for conversion over the next decade. Where once there was mostly forest, soon half of Riau will be covered in oil palms.

According to a 2001 report by the European Union and the Indonesian Ministry of Forestry, ‘It is inevitable that most new oil palm will be in the wetlands, as the more “desirable” dry lands of [Sumatra] are now occupied.’

‘Our actions now cast their shadow far into the future. [Climate policy needs to] have the economics of risk at its core; and go beyond the marginal changes which are the usual daily fare of economists.’

Nicholas Stern, former Chief Economist of the World Bank
DUTA PALMA: THE OIL PALM INDUSTRY’S RECIPE FOR CLIMATE DISASTER

The privately-held Duta Palma group is a company with major operations in Riau. It is one of Indonesia’s ten-largest palm oil refiners.

Duta Palma now controls about 200,000 hectares of land, over half of it in Riau. This landbank overlaps significant areas of deep peat, which are theoretically protected under Indonesian law.

Greenpeace analysed satellite data from the period 2001-2007. This showed significant forest clearance within several of Duta Palma’s contiguous concessions in Riau. According to official maps, nearly half of the total area of the concessions is on peatlands with a depth greater than 2 metres. One area is officially designated as protected peatlands, ie more than 3 metres deep.

Measurements made by Greenpeace of the peat depth in October 2007 show that the concessions lie on very deep strata of peat ranging from 3.5 metres in depth outside the boundary of the concession to more than 8 metres in the middle of the concession area. Therefore, the entire area should be protected under Indonesian law.

Additional field investigations by Greenpeace confirm extensive peat drainage, including construction of large canals, and clear-cutting of rainforests is happening across these concessions.

Duta Palma is also involved in the destruction of habitat critical to endangered and protected species including the critically endangered Sumatran tiger.

WHO CONTROLS THE TRADE?

ROUNDTABLE ON SUSTAINABLE PALM OIL

The Roundtable on Sustainable Palm Oil (RSPO) is a high profile initiative chaired by Unilever. Its members include major companies along the supply chain from plantations through to commodities traders, including Cargill and ADM, to the world’s food giants, including Cadbury’s, Nestlé and Tesco. Together they represent 40% of the global production and use of palm oil.

On-the-ground investigations by Greenpeace reveal that RSPO members are dependent on suppliers that are actively engaged in deforestation and the conversion of peatlands.

THE FOOD GIANTS

The RSPO board president Unilever is a major player in the global palm oil trade. It uses around 1.2 million tonnes of palm oil every year, or about 3% of total world palm oil production, most of which originates from Indonesia and Malaysia. It uses palm oil in brands such as Flora margarine.

Other leading brands including KitKat, Pringles, Philadelphia cream cheese and Cadbury’s Flake and leading companies including Gillette, Burger King and McCain are complicit in the expansion of palm oil at the expanse of Indonesia’s peatlands.

THE COMMODITY GIANTS

Much of the global trade in Indonesian palm oil is handled by traders based in Singapore. Some of the largest Singapore-based commodity traders are RSPO members, including the ADM-Kuok-Wilmar alliance, Cargill, Golden Hope and Sinar Mas.

The traders are also processors, blending palm oil which originates from deforestation and peatland destruction through their refineries and biofuel facilities.

The companies’ control over the entire palm oil supply chain – from plantations in Indonesia to refined palm oil or biofuel – means that they are in a decisive position to affect and change the market.

One RSPO member, a major food retailer, has complained to Greenpeace that efforts towards sustainability are hampered because: “…the global palm oil industry is unable at present to provide anyone with evidence of traceability beyond processor, to plantation level”.

Consequently, consumer companies who manufacture products using palm oil have virtually no way of knowing whether or not the palm oil they are using is from rainforest destruction and conversion of peatlands.

Through carrying on business as usual, the commodity trade and other big players are not taking the urgent action necessary to abandon destructive and socially unjust practices linked to the industry’s expansion.
‘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

BIOFUELING RAINFOREST DESTRUCTION

The scale of global diesel consumption dwarfs currently available feedstocks for biodiesel production. Substituting even 10% of worldwide demand for diesel fuel for road transport would require more than three-quarters of total current global soya, palm and rapeseed oil production.

Biofuels have a relatively low financial value compared to other agricultural products. Therefore, biodiesel is generally made from the cheapest of the bulk oil crops: soya, palm and rapeseed. Palm is far more productive per hectare than either soya or rapeseed and is the most significant vegetable oil in the world, accounting for 30% of world edible oil production in 2006/7.

Feeding the growing demand for biodiesel is likely to take place through expanding palm oil plantations in Indonesia. Big commodity traders are already planning significant expansion in the biodiesel infrastructure. Once this is established, it will feed off forest destruction and fuel not only cars but climate change.

Supplying Europe’s demand for biofuels is being driven by binding EU targets covering transport fuels. In early 2007, the EU Summit endorsed a minimum target for biofuels to constitute 10% of transport fuels by 2020. This almost doubles the target of the 2003 Biofuel Directive of a 5.75% contribution by 2010. The increased target is dependent on production being both ‘cost effective’ and ‘sustainable’.

Diesel fuel currently meets around 60% of the road transport fuel demand in Europe. Europe’s diesel fuel consumption was 172 million tonnes (Mt) in 2005. According to one RSPO member company, there is insufficient rapeseed available to meet EU targets. Of the alternatives, ‘vegetable oil sourced from palm oil is among the most widely and commercially available’. The company predicts a growth in the demand for biodiesel of 52Mt between 2005 and 2030 in the EU alone as road transport fuel demand continues to rise.

Meeting this projected growth in demand for vegetable oil through palm oil, for example, would require more than 15 million hectares of mature oil palm plantation. This is nearly three times the acreage that was under oil palm in Indonesia in 2005.

Many other countries from oil-dependent regions are turning to biofuels from Indonesia’s rainforests. This trade amounts to emissions transfer, not emissions reduction. GHG emissions associated with palm oil production, such as forest clearance, are attributed to the producer country.

The Chinese government expects that biofuels will meet 15% of its transport fuel demand by 2020. India has set a target of securing 20% of its diesel fuel from biofuels by 2012.

Greenpeace estimates that current plans for biodiesel refineries in Indonesia will create an additional biodiesel production capacity of up to 9Mt a year, including a 5Mt ‘mega-project’ planned by Sinar Mas.

To feed this desire for an expansion in capacity, companies are thinking ahead and turning their attention to the region of Papua on the island of New Guinea – the last great expanse of rainforest in Southeast Asia. There is already evidence of large-scale land-grabbing in the name of biofuel, with one company alone reportedly laying claim to nearly 3 million hectares of forest.

TICK TICK TICK … TIME FOR ACTION

Time is running out.

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 now.

The increasing worldwide demand for vegetable oil for food, combined with current land-grabbing by biofuel companies – many of them RSPO members – is significantly increasing pressure on the world’s threatened rainforests and other vulnerable habitats. Continued clearance of tropical rainforests, and their replacement with agricultural commodity crops like palm oil, seems inevitable unless action is taken now by industry and governments.

MAKING BIG EMISSIONS CUTS FAST: HALTING DEFORESTATION

Tropical rainforest destruction accounts for about one-fifth of global GHG emissions – more than the world’s cars, lorries and aeroplanes combined. Destruction of Indonesia’s peatlands alone accounts for almost 4% of global annual GHG emissions. 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$_2$

According to an IPCC report, up to 2Gt CO$_2$ (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 $100/tonne CO$_2$.

Significantly, this figure does not include potential to halt emissions from peatland and other bog fires.

**Cut two:**
Stop Indonesian peatland fires, establish a moratorium on peatland conversion: annual emissions savings – 1.3Gt CO$_2$

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$_2$

Avoiding emissions from the ongoing decay of 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 rehabilitate 43,500 hectares of degraded peatlands in Central Kalimantan, avoiding the emission of 3.4Mt of CO$_2$ a year, for a one-off investment of 500,000 (this equates to 0.15$/tonne). This is small change in global climate change terms.

**Total cuts:**
Potential annual emissions savings: up to 3.8Gt CO$_2$. This equates to nearly 8% of current annual GHG emissions.

STOP THE PROBLEM: ZERO DEFORESTATION

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.

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.

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.
This report shows how trade in palm oil by some of the world’s food giants and commodity traders is helping to detonate a climate bomb in Indonesia’s rainforests and peatlands.

Efforts to prevent dangerous climate change will not succeed unless this and other industries driving forest destruction are brought under control.

Every year, 1.8 billion tonnes (Gt) of climate changing carbon dioxide (CO₂) emissions are released by the degradation and burning of Indonesia’s peatlands – from less than 0.1% of the land on earth. These greenhouse gas (GHG) emissions are comparable to the total reduction in annual emissions required under the Kyoto Protocol from Annex 1 industrialised nations.

Successfully tackling climate change demands big cuts in emissions from burning fossil fuels. And this has to happen fast. Stopping deforestation also needs to be a priority.

Greenpeace has investigated forest destruction at carbon ‘hotspots’ in Indonesia by combining satellite imagery of forest fires with maps showing where the most dense carbon stores are. This research has taken us to Riau province on the island of Sumatra.

The peat soils of this once heavily forested province of 9 million hectares have the highest concentration of carbon stored per hectare of anywhere in the world. The area of peatland involved is tiny: just 4 million hectares – about the size of Taiwan or Switzerland. Yet Riau’s peatlands store 14.6Gt of carbon. If these peatlands are destroyed, the resulting GHG emissions would be equivalent to one year’s total global emissions of carbon dioxide, or five years’ emissions from all fossil-fuel power plants in the world.

Riau is also home to a quarter of Indonesia’s oil palm plantations, and another 3 million hectares are earmarked for conversion over the next decade. Where once there was mostly forest, soon half of Riau will be covered in oil palms.

Riau’s carbon stores are at risk – indeed, they could all go up in smoke if deforestation and degradation continue unabated.

Despite Indonesian government assurances and industry claims, our on-the-ground investigations confirm that oil palm companies continue to actively clear natural forest, and drain and burn deep peat (peat with a depth greater than 2 metres) that underlays these forests.

What’s driving this rainforest destruction? Global demand for palm oil.

So Greenpeace has gone to the world’s major traders and users of palm oil – companies like Cargill, Unilever and Nestlé – to find out who supplies them, and what their strategy is for dealing with the links between palm oil, deforestation and climate change.
These companies are all members of the Roundtable on Sustainable Palm Oil (RSPO). Headed by Unilever, the RSPO is a high-profile trade initiative established to ‘clean up’ the palm oil trade. Its members – including growers like Golden Hope, traders like Cargill, manufacturers like Nestlé and Johnson & Johnson, retailers like Tesco and Carrefour – account for 40% of global production and use of palm oil.

Cargill, a palm oil supplier, refused to comment on its trade links, claiming: ‘our business with [our customers] must remain confidential’. Unilever’s response to the devastation linked to palm oil expansion was to say that the company ‘hoped suppliers would see sense’. Nestlé responded that ‘most of our suppliers are members of the RSPO and as such have declared their commitment to sustainable sourcing’.

By painstakingly piecing together diverse evidence, we have traced the links between Riau’s peatland destruction and leading global food, cosmetic and retail brands, including Unilever, one of the world’s largest food giants, and Nestlé, one of the world’s leading chocolate manufacturers.

Our investigation has revealed the role of commodity traders including Cargill and ADM-Kuok-Wilmar, who control over a third of the Indonesian trade in palm oil. They blend palm oil from deforestation and conversion of peatlands into an undifferentiated supply for the global market, leaving little trace of their sources on the ground.

Further, these traders are investing heavily in infrastructure to allow palm oil to service projected global growth in demand for biofuel, in defiance of the evidence that producing vegetable oil by clearing rainforests and draining peatlands produces considerably more CO₂ emissions than biofuel use can avoid. Indonesia already has the highest level of climate changing emissions linked to deforestation of any country. Without clear market and political measures that preclude the use of palm oil from deforestation, this new market puts additional pressure on Indonesia’s carbon-rich rainforests and peatlands. For Kyoto Annex I industrialised countries, which have GHG emissions reduction targets, this is clever carbon accounting, putting the blame on Indonesia for products they consume. Effectively, emissions are not reduced but transferred from the car in industrialised countries to the forest.

The RSPO and its members have taken few meaningful steps to end the devastation and injustice linked to the industry and its expansion. By dragging out and complicating its ‘sustainability’ process, many in the industry are using the RSPO to cover their backs, putting off urgent action while the destruction continues.

While some RSPO member food manufacturers and retailers want to take action to avoid palm oil from deforestation, Unilever, Cargill, Nestlé and other powerful companies carry on with business as usual.

By driving the expansion of oil palm, these companies are effectively holding the climate to ransom.
Time is running out for the climate.

Climate change is undoubtedly the most serious environmental threat currently facing the planet. Leading climate scientists warn that if we allow average global temperatures to rise above 2°C Celsius, up to 30% of plant and animal species face increased risk of extinction, and about 15% of ecosystems are likely to be seriously affected. A series of reports released during 2007 by the Intergovernmental Panel on Climate Change (IPCC) acknowledge that climate change is already having serious impacts.

If business continues as usual, we are on track to see a much higher average temperature rise, with significant extinctions and major coastal flooding, as well as extensive damage to agriculture and water supplies.

At a certain point, rising global temperatures will tip the planet’s ecological balance. Temperature increase will disrupt ecosystems in ways that provoke feedback of more GHG emissions and a catastrophic acceleration of climate change. In the scientific language of the IPCC: “Synergistic interactions are likely to be detrimental.”

Carbon sinks of global significance, such as tropical rainforests and peatlands could become sources of GHG emissions. Every ecosystem that tips from a sink to a source increases the likelihood that another will tip – like a series of ever more powerful climate bombs being detonated.

The clock is ticking.

Keeping the global temperature increase below 2°C (compared to pre-industrial levels) means global emissions of GHGs must peak by 2015 and by this time the world must be set on track for drastic reductions in overall emissions.

Concerted action by individuals, international industry and political decision makers is imperative.

**FORESTS AS TICKING CLIMATE BOMBS**

The destruction of the world’s forests is one of the main causes of climate change, second only to the energy sector.

Forest ecosystems currently store about one and a half times as much carbon as is present in the atmosphere.

Tropical forests are critical to climate regulation, acting as a global cooling mechanism through the carbon they store, absorb and cycle. However, these natural buffers are rapidly being destroyed by industrial logging and deforestation for plantations and agriculture. The rapid ongoing expansion of these industries is a disaster for the climate.

Deforestation drives climate change through substantial GHG emissions: deforestation – virtually all of it from tropical rainforest destruction – accounts for about a fifth of all global emissions. This is more than the emissions from all the world’s cars, trucks, and aeroplanes. Deforestation also means that there is less forest area to reabsorb the carbon emitted to the atmosphere.

Moreover, climate change – in part driven by forest destruction – may soon tip these carbon stores into sources as forests start to die back. According to the IPCC, the carbon stored in forests is vulnerable to both current climate change and agricultural expansion.

More GHG emissions from deforestation, as well as fossil fuel emissions, increase the risk of reaching an ecosystem tipping point. Such a tip would probably put an end to any chance of stopping catastrophic climate change.

Therefore, addressing deforestation must be a critical component of both political policy and market regulation.
INDONESIA’S RECORD-BREAKING DEFORESTATION AND GHG EMISSIONS

Indonesia now has the fastest deforestation rate of any major forested country.\textsuperscript{25} Losing 2% of its remaining forest every year, Indonesia has earned a place in the Guinness Book of World Records.\textsuperscript{26} Indonesia also holds the global record for GHG emissions from deforestation, which puts it third behind the USA and China in terms of total man-made GHG emissions.\textsuperscript{28}

Over the last 50 years, over 74 million hectares of Indonesia’s forests,\textsuperscript{28} an area three times the size of the UK,\textsuperscript{28} have been destroyed – logged, burned, degraded, pulped – and their products shipped round the world.

Palm Oil Expansion Is Creating a State of Emergency

A 2007 UNEP report recognises that oil palm plantations are now the leading cause of rainforest destruction in Malaysia and Indonesia.\textsuperscript{31}

Within Indonesia, virtually all palm oil is currently sourced from Sumatra and Kalimantan. In 2005, three-quarters of the planted area (some 4.2 million hectares) was on Sumatra.\textsuperscript{32} The Indonesian Palm Oil Research Institute (IOPRI) estimates that two-thirds of all currently productive oil palm plantations involved deforestation.\textsuperscript{33}

According to World Bank estimates, between 1985 and 1997, 60% of the lowland rainforest of Kalimantan and Sumatra was destroyed,\textsuperscript{34} with the expansion of oil palm plantations being a major driver.\textsuperscript{35}

Prime Numbers: International Commitment to Tackling Climate Change at Bali

The next phase of the Kyoto Protocol must address deforestation. A strong mandate in Bali is a first critical step towards an international vision and direction that inspires countries to agree and act upon essential measures to reduce collective GHG emissions by 2015.

Such an agreement requires a mechanism – including adequate funding – to drastically reduce deforestation. The reductions from forest protection must be additional to cuts in industrial emissions.

Oil palm plantation in central Kalimantan

The Last Stand of the Orangutan

State of Emergency: Illegal Logging, Fire and Palm Oil in Indonesia’s National Parks
Deforestation, peatland degradation and forest fires have placed Indonesia among the top emitters of greenhouse gases in the world, among industrial giants the United States and China [...] Global warming will likely cause a vicious cycle by drying up the rainforest and peat swamps, thus increasing the risks of even more intense fires.
Peatlands are perhaps the world’s most critical carbon stores. Covering just 3% of the earth’s land surface, they nevertheless store somewhere between a fifth and a third of the total carbon contained in the terrestrial biosphere, including all soils and vegetation – Wetlands International puts the figure at 528 billion tonnes of carbon. If all this peat were burnt or fully degraded, it would release 1035Gt of CO₂, or 190 times the current annual global emissions from fossil-fuel power stations.

As a result, preserving peatlands is critical if we are to maintain climate stability. Tropical peat is extremely carbon-rich. Southeast Asian peatlands are estimated to store an average of 60kg of carbon per cubic metre, and in total they hold an estimated 42Gt of carbon, equivalent to 15 years’ global emissions from fossil-fuel power stations at current levels. 90% of this is in Indonesia. There are about 22.5 million hectares of peatlands in Indonesia, including peat swamp forests. These areas contain some of the world’s deepest peat deposits – up to 15 metres.
The carbon stored in tropical peatlands is rapidly being released as these habitats are destroyed. Southeast Asian peatlands in particular are being decimated by logging and agricultural expansion, especially for oil palm plantations.

If current trends continue, almost all of Southeast Asia’s peatlands could be drained in the coming decades, putting all 42Gt of stored carbon at risk.

**CARBON CYCLING AND STORAGE**

Plants make up an essential part of the global carbon cycle – they take in CO₂ from the atmosphere, store carbon while they live, as a chemical constituent of their tissues and fluids, then return it to the atmosphere through decomposition when they die. In an undisturbed ecosystem this process is largely in balance and as such does not play a role in causing climate change.

Whole ecosystems such as forests can thus be viewed as long-term carbon stores, holding carbon for centuries or millennia and in huge quantities. The separate parts of this store of carbon – individual trees, for example – may die, decay and so release stored carbon back into the atmosphere, but the ecosystem as a whole retains a store of carbon as each decomposing tree is replaced by a new growing one.

An ecosystem’s soils also store carbon. Peat soils, consisting almost entirely of dead vegetation saturated with water, accumulated over hundreds or thousands of years, can store hundreds of tonnes of carbon per hectare. The microorganisms which normally carry out decomposition are unable to function due to the limited oxygen content of the water, suspending decomposition and thus storing the carbon indefinitely. As long as new peat is forming, more carbon is absorbed by the ecosystem than is lost from it, making it a net accumulator of carbon – a carbon sink. With the right conditions of pressure and heat over thousands or millions of years, peat can turn to coal – fossilised carbon removed from the carbon cycle almost indefinitely unless it is burned.

Destroying natural carbon sinks makes a double contribution to global warming: the stored carbon is released to the atmosphere, and at the same time, the capacity of the ecosystem to absorb new carbon from the atmosphere is curtailed.
COUNTING THE CLIMATE COST OF PEATLAND DESTRUCTION

Once peatland is drained, oxygen in the air enables decomposition of the biological material in the peat, releasing the stored carbon as CO$_2$. How fast the peat decomposes depends partly on temperature: in the heat of the tropics, decomposition can be up to ten times faster – and annual emissions ten times higher – than in colder regions such as Siberia. Drainage of tropical peatland to one metre depth results in emissions of 80–100 tonnes of CO$_2$ per hectare per year, excluding the effects of fire. Emissions continue over a period of decades, tailing off as the carbon store runs out. Deeper drainage will cause higher emissions. Dry peat is also highly flammable, and once drained, whole areas can catch fire and can burn for months, producing rapid and massive emissions of greenhouse gases, as well as smog.

In Southeast Asia, large-scale drainage of peatlands takes place to permit logging of the peat swamp forests; logs are also transported in the drainage canals. After logging, drainage continues or even intensifies to enable the establishment of oil palm or pulp wood (acacia) plantations. These tree species require deep drainage, which dries out more peat and so causes more emissions. Over a quarter of oil palm plantations are on peat. Drainage for logging alone is usually less deep, but the effects are significant as it can cover very large areas.

Moreover, peat drainage can have effects on a whole landscape, not just the area targeted. Deep drainage, for
example for oil palm plantations, drains off water from adjoining, still forested areas, and the general water table begins to fall. This effect can extend several kilometres from the intentionally drained area, resulting in a greatly increased release of CO₂. As a result it is likely that existing calculations of GHG emissions from drained peatlands are underestimated.

Wetlands International estimates CO₂ emissions from peatlands across Southeast Asia between 1997 and 2006 at around 2Gt per year (1,400Mt from fires and 600Mt from decomposition caused by drainage). 1.8Gt of this – 90% – is estimated to have been from Indonesia. As a result of peatland emissions, Indonesia ranks as the world’s third highest emitter of greenhouse gases, after the USA and China. Brazil ranks fourth, mainly due to deforestation.

While degraded tropical forests and peatlands release their stores of carbon over decades, burning releases these stores into the atmosphere rapidly and damages the capacity of the ecosystem to recover.

In 1997/98, Indonesia witnessed an abnormally long, El Niño-influenced, dry season. Uncontrollable fires across millions of hectares of degraded peatlands and forest released GHG emissions equivalent to up to 40% of annual global emissions from fossil fuels for the 1990s.

While the practice of burning forest areas has been illegal in Indonesia since 1999, in the subsequent decade large peat areas have been burned every year as forest clearance continues unchecked. In 2006 alone, over 40,000 fires occurred in peatland areas in Southeast Asia.

Stopping deliberate burning within concession areas would slow the pace of the alarming GHG emissions from the clearing of peat forests, but would not prevent them. This is because the very process of drainage makes entire peatland landscapes dry, volatile and therefore susceptible to fire. Degrading Indonesia’s peatlands puts their carbon stores at risk.
RIAU: A LIT Fuse
Riau province in Sumatra has one of the most significant peatland carbon stores anywhere in the world.

The peat forests in Riau account for just over a sixth of Indonesia’s peatland area, but due to their great depth they hold more than 40% of the country’s peatland carbon store. The area involved is tiny: just 4 million hectares of peat – about the size of Taiwan or Switzerland. This 14.6Gt of carbon stored in Riau’s peatlands is highly vulnerable and could all go up in smoke if deforestation and degradation continues. This would emit the equivalent of one year’s global GHG emissions.

In 1982, forests including peat forests covered more than three-quarters of mainland Riau, some 6.5 million hectares. By 2000, most of the accessible lowland forests with valuable timber species had been destroyed, and conversion of Riau’s peatland forests began in earnest.

Greenpeace’s analysis of satellite images of forest cover between 2001 and 2007 shows active deforestation has taken place on oil palm concessions, many of which are on peatlands.

What has been driving this rapid deforestation?

Today, Riau is the largest producer of two of Indonesia’s most important export commodities based on forest destruction: paper and palm oil.
FIRE HOTSPOTS IN RIAU DURING 2006

Peat
Palm oil concessions
Fires 2006

Kilometres
Two of the world’s largest pulp and paper companies, APRIL and APP, have their mills in Riau. In 2006, WWF estimated that around 450,000 hectares of natural forests had been cleared since 2001 to supply APP’s pulp mill in Riau. Accordingly, wherever deforestation occurs, including the expansion of oil palm into natural forest, the majority of the timber harvested is sold for pulp.

By 2005, there were 1.4 million hectares of oil palm plantation in Riau – 25% of Indonesia’s total production area. According to Wetlands International, more than 2 million hectares of Riau’s lowland peat is occupied by concessions of one sort or another – logging concessions, pulp wood or oil palm plantations.

Despite grave levels of degradation, Riau has the largest remaining area of natural forest on peat in Sumatra, making it vulnerable to predatory conversion.

Local governments in Riau collectively have plans to expand oil palm plantations by 3 million hectares. The 2007 draft of the new provincial land-use plan shows that many hundreds of thousands of hectares of peatland have been designated for conversion. Most of these forests are on peat soils with depths of over 2 metres.

THE PALM OIL INDUSTRY

Oil palm expansion is out of control. Based on permits for conversion to plantations and other agricultural uses, Indonesia has destroyed over 28 million hectares of forest since 1990, yet plantations of either palm oil or pulp wood have been established on only 9 million hectares, clearly implying that most of the companies obtained permits to convert the forest only to gain access to the timber. In the Sumatran province of Jambi alone, the NGO Sawit Watch has reported around 800,000 hectares of abandoned cleared forest.

However, palms continue to be planted on newly-cleared forest land, because companies subsidise the establishment of oil palm plantations by selling timber from the concession area. In addition, the industry controls huge landbanks of forested areas that it has yet to clear. Thus, despite assertions to the contrary by government and industry bodies, expansion into peat forests continues, not because of an absolute shortage of land, but because of the economic incentive for companies to cash in on the trees. Data from the Riau Plantation Service suggest that nearly 40% of oil palm concessions in Riau are on peat.

This expansion into forest and peatland, and the related deforestation and GHG emissions, takes place with little oversight from central or local government. Procedures for environmental impact assessment, land use planning and ensuring a proper process for development of concessions are neglected.

Some of these new plantations are located on peat that should be off limits to development or degradation according to Indonesian law. This stipulates that land should not be allocated for oil palm plantations on peat soils deeper than 2 metres; in addition, activities that damage upstream natural swamp forests with deep peat (more than 3 metres) are prohibited. In other words, palm oil development on such peatlands is illegal.
In early 2007, through satellite monitoring, Greenpeace identified fire hotspots in Riau Province.106 Intelligence, based on the comparison and overlay of peatland maps with concession maps, signalled that there was significant overlap between the location of these fires, peatlands and oil palm concessions.

Duta Palma is one of several groups involved in the oil palm industry that is rapidly expanding its landbank – and thereby its direct influence over future environmental impacts from the expansion of the industry.

Field investigations by Greenpeace of Duta Palma group operations in the district of Indragiri Hulu in Riau between June and September 2007 reveal the serious threat to the climate posed by the expansion of the oil palm industry.
Peat inside the concession boundary measured from nearly 4 to over 8 metres depth.
MEET DUTA PALMA

The privately held Duta Palma group is one of Indonesia’s ten largest palm oil refiners and a member of the Roundtable on Sustainable Palm Oil (RSPO).

Greenpeace investigations have revealed evidence of serious breaches of Indonesian law including operating without concession title, illegal clearance of deep peatlands and intentional burning.

In the absence of due legal process and governance, however, the destruction – and its climate impacts – continues virtually unchallenged.

TAKE THOUSANDS OF HECTARES OF VALUABLE RAINFOREST

Duta Palma is expanding rapidly. Greenpeace investigations into Duta Palma-related companies confirm that in the past few years, the Duta Palma group has significantly expanded its plantation concession area, notably in Indragiri Hulu District (Riau) and in West Kalimantan Province.

According to the group’s website, the Duta Palma group controls 60,000 hectares of land in Riau with a planted area of 42,000 hectares. Despite the claims made on the group’s website, the company now controls about 200,000 hectares, over half of it in Riau. This concession area is well in excess of the national regulations in place until February 2007, which forbade company groups from owning a concession area in excess of 20,000 hectares per province. Duta Palma companies already held permits for well over 20,000 hectares in Riau before the change in the law. Current Indonesian law forbids any one company from holding in excess of 100,000 hectares outside Papua.

Much of Duta Palma’s concession area is yet to be cleared or planted with oil palms, and large areas of this landbank are valuable forest habitat for rare and threatened plant and animal species as well as being essential to indigenous or local communities, whose land rights have been ignored by company and government alike.

Particularly in Riau, the Duta Palma concession area overlaps with significant areas of deep (greater than 2 metres) peat. Spatial analysis by Greenpeace of peat distribution shows that the company controls 55,000 hectares of peatland in Riau.
ADD PROTECTED PEATLAND DOMES INTO THE MIX

Riau has significant peatlands more than 2 metres deep, yet many plantation concessions are located on such soils despite laws and regulations meant to protect these areas from conversion.

Legally, forest conversion for oil palm plantations should not take place on land with peat depth greater than 2 metres, nor may it directly or indirectly impact forest on land with peat depth greater than 3 metres – such peatlands are formally protected by Ministry of Forestry and Presidential decrees.\(^1\)

Analysis by Greenpeace of 2001–2007 satellite data shows significant illegal forest clearance within four of Duta Palma’s concession areas PT Kencana Amal Tani (PT KAT), PT Banyu Bening Utama (PT BBU), PT Bertusah Aneka Yasna (PT BAY) and PT Palma Satu.\(^2\) Large parts of this clearance are inside areas with peat depths over 2 metres, according to peatland distribution maps produced by Wetlands International and used for the development of provincial land use plans.\(^3\) The 1994 provincial land use plan for Riau designates the entire area of PT Palma Satu as protected peatlands,\(^4\) ie more than 3 metres deep. Under the supervision of experts from the Center for International Cooperation in Sustainable Management of Tropical Peatland (CIMTROP), in October 2007, Greenpeace investigators documented the depth of the peatland soils in Duta Palma’s PT BBU and PT Palma Satu concessions, immediately adjacent to PT BAY.

According to official maps, peatlands within these concessions cover a total area of about 14,850 hectares – nearly half the area of these concessions.\(^5\) Over 90% of this peatland (14,190 hectares) is marked as 2–4 metres deep.

Depth of peat is assessed by boring into the peat with a peat drill until mineral soil is reached. To gauge the volume of the peat dome, Greenpeace took regular depth measurements from the dome’s edge beside the Cenuku river, outside the concession areas, along the border between PT BAY and PT BBU to deep inside the PT Palma Satu concession area.

Our investigations show that these concessions lie on very deep strata of peat – ranging from 3.5 metres in depth outside the boundary of the plantation \((0°29'15.00"S – 102°37'54.54"E)\) to more than 8 metres in the middle of the concession area. \((0°30'5.93"S – 102°37'54.67"E)\). The Greenpeace investigation also involved a survey of the water table in order to assess the condition of the peat within the dome. If the peat is not fully drained, restoration is possible.

Our analysis shows that the peat soil has not yet been irreparably damaged.

However, the team documented active rapid drainage of the concessions through two canals. If the drainage continues at the current rate, restoration and preservation of these peatlands will soon be impossible. In a few years the peat will be dry, making it vulnerable to fire and causing rapid release of \(\text{CO}_2\) to the atmosphere.

It is clear from the investigation that provincial land use plans rely on peat distribution maps that have not been properly verified on the ground by the government or any other institution.

Our investigation found that in just one sample area, the peat depth – and therefore the carbon stores – were double that predicted by the maps. It is possible that Southeast Asia’s carbon stores as a whole have been grossly underestimated, meaning the potential climate impact from peatland destruction may be even greater than previously thought.
CLEAR THE FOREST AND DRAIN THE PEATLAND

Greenpeace field investigations confirm that the extensive drainage, construction of large canals, and clearcutting of deep peat forest (over 2 metres) is ongoing in PT BBU and PT BAY. Greenpeace field investigations also found recent extensive drainage by PT BAY to depths of up to 7 metres. Within the PT BBU concession, Greenpeace documented recent extensive drainage and clearance on peatlands over 3 metres deep.

Greenpeace field investigations in the forest area claimed by PT Palma Satu documented an extensive network of drainage canals indicative of preparations for clearance for oil palm plantations. Investigators documented drainage work taking place to a depth of 8 metres. The peat may be even deeper.

STIR IN AN EARTH MOVER

Drainage allows access by earth movers and other heavy excavation machinery, which speeds up forest clearance.

SKIM OFF THE VALUABLE TREES

Demand for pulp for Riau’s pulp and paper mills is part of what subsidises the establishment of oil palm plantations – a key financial incentive to clear forest instead of using degraded lands.

Greenpeace’s field investigation found that Duta Palma is operating in areas previously covered with peat swamp forest.

Once access is gained to the forest, either through opening roads or canals, logs for timber or pulp are cut, stacked beside canals and then floated down the canals to the mills.

Previous field investigations in the area of Duta Palma’s PT KAT concession tracked timber from forest clearance for oil palm expansion to the RAPP pulp mill owned by APRIL.118

Local people informed Greenpeace investigators that timber from the recent clearance of PT BAY has been sold to the Indah Kiat pulp mill owned by APP.119
‘The main areas remaining for new extensive plantations are the large tracts of tropical peatlands – until recently virgin rainforest areas. Over 50% of new plantations are planned in these peatland areas.’

Wetlands International, 2007

CHOP DOWN THE REMAINING FOREST

Trees and other vegetation that cannot be sold to pulp mills are often cleared using heavy machinery. Timber is then stacked for burning. Alternatively, it may just be left lying on the ground to decay.

Greenpeace field investigations found significant recent clearfelling inside PT BBU, PT BAY and PT Palma Satu concessions.120

SIMMER OVER A HOT FLAME

Since January 2006, fires have broken out several times inside Duta Palma concession areas or in adjacent areas being cleared. Incidences of burning have been reported to various authorities by the village head of Kuala Cenaku, but no legal action has resulted.

Greenpeace investigators saw evidence suggestive of illegal, intentional and systematic land clearing using fire in virtually all parts of the PT BAY concession. This included burn rows – stacks of timber ready to be burned on recently cleared land – as well as burnt stumps and thick black charcoal lines where rows of timber and debris have been burnt.121

Planting of oil palm seedlings often takes place immediately after burning as the fire makes the peat more alkaline and suitable for the young plants.

Field investigations found similar evidence within the PT BBU concession.

There is also evidence of extensive burning within the area being cleared by Palma Satu, with burnt stumps visible.

PLUCK OFF THE TIGERS AND OTHER UNWANTED WILDLIFE

Duta Palma is also involved in the destruction of habitat critical to endangered and protected species.

The Sumatran tiger (Panthera tigris sumatranus) is critically endangered with less than 250 individuals remaining in the wild.122

The area claimed by PT Palma Satu is tiger habitat. Local villagers told Greenpeace investigators that they could still regularly hear at least two tigers roar in the forest indicating that the concession is located in habitat of high conservation value.
**THE RSPO GROUP OF FRIENDS**

**Unilever** is one of the world’s largest food processing giants, selling household food and cosmetic brand names in nearly every country. It is president of the RSPO.

‘Conversion of land for agriculture is the biggest threat to tropical rainforests alongside illegal logging... There are instances where the development of new oil palm plantations has led to conversion of forests with high conservation value and has threatened the rich biodiversity of these ecosystems. The use of fire for preparation of land for oil palm planting also contributes to forest fires and widespread polluting haze over vast areas.’

**Unilever, Sustainable Agriculture Initiative**

ADM Wilmar

ADM-kuok-wilmar is a shareholder alliance between ADM and the Kuok family controlling over 570,000 hectares of concession area, palm oil refineries and biodiesel plants across Indonesia and Malaysia.

ADM Pura Foods operates a jetty outside London handling more than 300,000 tonnes of edible oils a year, including palm oil. These bulk oils are delivered directly into the Unilever factory next door, the largest margarine factory in the world, producing brands such as Flora and Bertolli.

**CO2 world traveller**

**Photos**

**Groups**

RSPO • How to profit from climate change
**Factbook**

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**Cargill**

Cargill is the largest privately held company in the world, it is a major plantation owner, trader, refiner and distributor of palm oil and palm oil products including biodiesel. It has palm oil related operations across Indonesia, Malaysia, Papua New Guinea, Europe, Australia, India, Russia, and the USA.

**Golden Hope**

Golden Hope is a Malaysian government company controlling plantations, refineries and biodiesel plants across Indonesia and Malaysia.

In October 2007, Golden Hope announced plans to expand its landbank in the heavily forested province of Papua. However, an internal presentation indicates that the company plans to develop a rainforest area of up to 2.8 million hectares in Papua.

**Synergy Drive**

Synergy Drive will be the ‘world’s biggest palm oil entity’ formed by merging Kumpulan Guthrie and Sime Darby to form Synergy Drive.

**CO2 world traveller**

**Sinar Mas** is planning to expand its landbank. The group already accounts for 11% of palm oil production in Indonesia.

Sinar Mas has publicly announced plans to expand its landbank in the heavily forested province of Papua. However, an internal presentation indicates that the company plans to develop a rainforest area of up to 2.8 million hectares in Papua.

**RSPO**

Unfortunately, not every palm developer operates responsibly. Forests have been logged (sometimes illegally) to make room for palm plantations. Destroying forests to plant palm is a net negative for trapping carbon and mitigating climate change.
The Roundtable on Sustainable Palm Oil (RSPO) is a voluntary association of corporations and NGOs set up in 2002. In October 2007, it had nearly 200 members. Corporate members include global food giants such as Unilever, Cadbury’s, Nestlé and Tesco, and global commodity traders including Cargill. RSPO members account for an estimated 40% of global palm oil production and use.

The RSPO has aimed to develop a global definition of sustainable palm oil production and better management practices. Companies are required to report on their progress in meeting RSPO criteria, but the organisation’s impact on the ground in terms of halting industry expansion into rainforest and peatlands has been negligible.

At present the RSPO scheme does not prohibit palm oil producers from being involved in forest conversion and has no assessment of, or limits on, GHG emissions from the development of oil palm plantations. Furthermore, it has no system to segregate palm oil that meets RSPO criteria from palm oil coming from deforestation including peatland clearance.

Unilever is an RSPO member and one of the world’s largest food processing giants, selling household food and cosmetic brand names in nearly every country. It claims to be the world’s biggest ice cream producer with brands such as Walls and Ben & Jerry’s. It also owns the world’s largest margarine factory, producing brands such as Flora and Bertolli.

Ben & Jerry’s ice cream, Flora margarine, Knorr soups and cosmetic products such as Dove soap, Vaseline and Timotei shampoo are among the many household name products containing palm oil.

Unilever uses around 1.2Mt of palm oil every year, about 3% of total world palm oil production. According to a high-level industry source, Unilever is ‘one of the biggest palm oil users in Europe’. At the global level, Unilever is a major player in the palm oil trade.

Most of this comes from Indonesia and Malaysia. During the 12 month period from July 2003 to June 2004, Unilever bought approximately 570,000 tonnes of palm oil from Indonesia, more than 5% of the country’s production.

UNILEVER’S SUPPLIERS – CARGILL, ADM-KUOK-WILMAR, GOLDEN HOPE AND SINAR MAS

‘At the global level, Unilever is a major buyer and exporter from Indonesia of palm oil [...] These purchases represent 5.1% of Indonesian production.’

Oxfam and Unilever report, 2005

Virtually all of Indonesia’s palm oil is exported through Sumatra. Most of the global trade in Indonesian palm oil is handled by traders based in Singapore. In the first half of 2007, Singapore-based brokers traded over 2.6Mt of the palm oil exported through ports of Sumatra – over 50% of total trade.

Some of the largest of these Singapore-based commodity traders are RSPO members, including the ADM-Kuok-Wilmar alliance, Cargill, Golden Hope and Sinar Mas. In the first half of 2007, these traders controlled over a third of Indonesia’s exports of palm oil. The traders are also processors, blending palm oil from deforestation and peatland destruction through their refineries and biofuel facilities.

Given that traders’ control of the market prevents traceability, one RSPO member, a major food retailer, has complained to Greenpeace: ‘It is unfortunate that the global palm oil industry is unable at present to provide anyone with evidence of traceability beyond processor, to plantation level, so we are severely constrained in what we can do at present.’

Greenpeace analysis of trade data, annual reports and information from industry sources shows that Unilever is trading with Cargill, ADM-Kuok-Wilmar, Golden Hope, and Sinar Mas.
Cargill – Trading with Unilever

‘Unfortunately, not every palm developer operates responsibly. Forests have been logged (sometimes illegally) to make room for palm plantations. Destroying forests to plant palm is a net negative for trapping carbon and mitigating climate change.’

Cargill News 2007

Cargill is an RSPO member137 and is the largest privately-held company in the world.138 Cargill is a major plantation owner, trader, refiner and distributor of palm oil and palm oil products including biodiesel. It has palm oil related operations across Indonesia, Malaysia, Papua New Guinea, Europe, Australia, India, Russia, and the USA.139

Industry sources confirm that roughly half of the palm oil imported into Europe by Cargill comes from Indonesia.140

According to export data for the first half of 2007, Cargill’s Singapore trading arm exported at least 220,000 tonnes of palm oil from 13 different oil palm concession holders in Indonesia, some with holdings in Riau, including Astro Agro Group, Salim Group and Musim Mas.141 Over 70,000 tonnes of this went to Germany, The Netherlands and Italy; 40,000 tonnes was shipped to Malaysia; the remainder went to China, India and the rest of the world.142

Cargill’s palm oil shipments to Malaysia are likely to have been delivered to Cargill’s refineries in Port Klang and Kuantan, which export 90% of their production.143

For example, Greenpeace has traced palm oil from a Cargill refinery to Knorr soup, one of Unilever’s high profile brands. Every week, Unilever in Rotterdam places an order for about 100 tonnes of refined palm oil with Cargill’s Hamburg refinery.144 This is trucked to the Unilever’s food processing plant in Pozna , Poland – the main production facility for Knorr brand products, which are exported all over the world, including Germany, the UK, Sweden, Belgium, The Netherlands, Russia, and the USA.145 The facility uses palm oil in over 150 different products, mainly dehydrated food products like instant soup.146

Cargill is also one of Unilever’s European suppliers of palm oil for ice cream.147

THE ADM-KUOK-WILMAR ALLIANCE – TRADING WITH UNILEVER

Wilmar is an RSPO member. It claims to be the world’s largest producer of palm oil based biodiesel.148 The group – effectively a shareholder alliance between ADM,149 and the Kuok family150 – controls over 570,000 hectares of concession area (just over a third of this has been cleared and planted), palm oil refineries and biodiesel plants across Indonesia and Malaysia.151 In 2006, the group produced over 830,000 tonnes of crude palm oil, accounting for 6% of Indonesia’s production.152 Although Wilmar owns substantial concession areas, more than 75% of its palm oil trade comes from third party plantations.153

The Kuok Group was founded by Robert Kuok Hock-Nien, the uncle of William Kuok, one of Wilmar’s founders. According to Forbes, in 2005, Robert Kuok Hock-Nien was the richest man in Asia.154

The US-headquartered ADM claims to be the world’s leading processor of agricultural crops and Europe’s leader in biofuels.155 The company trades crude palm oil on the Chicago futures market (ie contracts are signed and traded months ahead of delivery).156 According to a high-level industry source, ADM is Cargill’s main competitor in the palm oil sector.157

In a 2006 declaration to institutional investors, Wilmar announced that its key international customers include Procter & Gamble, Cargill, Unilever, Nestlé and China Grains & Oils Group Corporation.158

Immediately next door to Unilever’s margarine factory outside London, a subsidiary of ADM operates a jetty handling more than 300,000 tonnes of edible oils a year, including palm oil. These bulk oils are delivered to a wide range of food factories around the UK and overseas, as well as directly into the Unilever factory.159 This is the largest margarine factory in the world,160 producing brands such as Flora and Bertolli.161

Golden Hope – Trading with Unilever

‘We are the first plantation company in Malaysia to receive the Global 500 Award by the United Nations Environment Programme (UNEP) for our “Zero Burning” practices.’

Golden Hope 2006

Golden Hope is an RSPO member.162 Golden Hope controls plantations, refineries and biodiesel plants across Indonesia and Malaysia.164

In October 2007, Golden Hope was in the final legal stages of merging with Malaysian palm oil companies Kumpulan Guthrie and Sime Darby to form Synergy Drive.165 All of these publicly listed companies are controlled by the Malaysian government.166 Golden Hope’s website describes the deal as ‘creating the world’s biggest palm oil entity and potentially “the world’s largest biofuels producer”.’167

The company explicitly sees Indonesia as a place for expanding its business.168

While Golden Hope has long-established palm oil plantations in Peninsular Malaysia, the company now also controls a total area of 60,000 hectares in West Kalimantan,
Indonesia, of which 13,000 hectares are planted with oil palms. Kumpulan Guthrie currently owns and operates 52 plantation estates in Indonesia with a total land area of 220,000 hectares spread over Sumatra, Kalimantan and Sulawesi, of which 165,000 hectares has been planted. Bloomberg News reports that Synergy Drive will produce 2.2 Mt of crude palm oil (CPO) a year, nearly 6% of global palm oil production.

According to a high-level industry source, Golden Hope is a major supplier to Unilever. The relationship between the two companies is longstanding. In 2002, Golden Hope bought Unimills, Unilever’s oil refinery in Rotterdam in The Netherlands. Unimills is the second largest diversified oil and fats blend manufacturer in Europe – an industry that uses large quantities of palm oil.

**SINAR MAS – TRADING WITH UNILEVER**

Sinar Mas is an RSPO member through its oil palm plantation subsidiary PT SMART.

The Sinar Mas group accounts for 11% of palm oil production in Indonesia. The group has publicly announced plans to expand its landbank in the heavily forested province of Papua by 1 million hectares and in Kalimantan by 100,000 hectares. However, an internal company presentation obtained by Greenpeace indicates that the company plans to develop a rainforest area of up to 2.8 million hectares in Papua. As Indonesian law does not allow any one company to hold in excess of 200,000 hectares in Papua, Sinar Mas has split large forest blocks into several concession areas. For example, it has created 14 separate companies in a bid to gain control of over 1.8 million hectares in the forested southeast corner of Papua.

Unilever has a long-standing relationship with Sinar Mas, with one 1999 Sinar Mas document stating: ‘Our major customers include Cargill and Unilever. These sales were made through foreign brokers or directly to the importer located in the countries to which the products were exported.’ The Sinar Mas 2004 and 2006 Annual Reports also indicate that Unilever has been an important client in 2003–2006, along with Nestlé and Carrefour.

**WHAT THE COMMODITY TRADERS ARE ADDING TO THE MIX**

Global commodity traders including ADM-Kuok-Willmar, Cargill, Golden Hope and Sinar Mas have commanding control over the entire palm oil supply chain – from plantations in Indonesia to refined vegetable oil or biofuel. In addition to their direct control of massive landbanks and processing infrastructure, most of these traders have substantial dealings with third party suppliers. This means that they are in a decisive position to determine supply and influence the market.

Through the indiscriminate purchasing and blending of palm oil from deforestation and the conversion of peatlands into an undifferentiated supply for the global market, their operations render responsible purchasing virtually impossible. In this way, they fuel climate change, biodiversity loss and social conflict. As one RSPO member, a major food retailer, described it: ‘Due to the logistics of this particular commodity market, real traceability is simply not possible at this time.’

Consequently, consumer companies who manufacture products using palm oil have virtually no way of knowing whether or not the palm oil they are using is from rainforest destruction and conversion of peatlands.

This lack of traceability in the supply stream was described to Greenpeace by RSPO members, including a commodity trader, an international retailer and a food manufacturer:

1. ‘Firstly numerous plantations, of varying sizes, crush the palm fruit at in-country mills’ – in other words, many suppliers.
2. ‘The crude palm oil is then transported to shared storage tanks at ports awaiting export’ – in other words, no segregation.
3. ‘The majority of this volume is shipped using shared vessels which en route to their final destination may pick up additional crude palm oil from other producing countries’ – in other words, no segregation.
4. ‘In Europe, Rotterdam is the main consolidation (bulk storage) port for the imports of crude palm oil’ – in other words, no segregation.
5. ‘Brokers will then sell the oil on to either end users or in the majority of instances, on to processors’ where the palm oil may be blended with other oils – in other words, no segregation.
6. ‘It is only at this stage that RSPO members who use palm oil in finished products actually buy palm oil: indeed, most Indonesian ‘palm oil used within Europe is bought on the open market’.

The conclusion is straightforward, as one RSPO member said: ‘We do not believe it is possible currently to robustly trace and segregate a specific source (country & region) for commercial volumes of palm. The only exception to this being limited quantities of crude organic palm oil.’ Further, even when palm oil that meets RSPO criteria becomes commercially available, ‘due to the complexity of the supply chain, it will be virtually impossible to guarantee true segregation of sustainable palm oil’.

Many RSPO members, including one of the world’s top names in confectionery, claim that virtually all of their palm oil is supplied by RSPO members – eg refiners and traders like ADM-Kuok-Willmar, Cargill, Golden Hope and Sinar Mas. However, these actors are driving the expansion of the palm oil industry in Indonesia, leading to further deforestation, degradation of peatlands and GHG emissions.

The commodity trade and other big players who are end users of palm oil are using RSPO membership to deflect attention from the real crisis linked to the industry’s expansion.
WHO SUPPLIES THE TRADE?

Sinar Mas Group – directly trading forest destruction

Is Sinar Mas an RSPO member? Yes
Expanding into biofuels? Yes
Approximate size of known concession area:
Indonesia 1.65 million ha  
Riau 109,000 ha

Links to Riau deforestation and peatland degradation

Peatland:
6 concessions, estimated total area over 54,000 ha
Historic deforestation within the last two decades (1989–2003): 7 out of 12 concessions
Recent or ongoing deforestation (2001–2007): 6 out of 12 concessions
Recent fire hotspots (2005–2007): 6 (3 peatland) concessions
Global trade:
Sinar Mas exported some 400,000 tonnes of palm oil products in the first half of 2007. India and China took nearly half of all exports. 85,000 tonnes was shipped to Italy, The Netherlands, Germany, Spain and the UK.
Is Unilever using Sinar Mas palm oil? Yes

ADM-Kuo-Wilmar – directly trading forest destruction

Is ADM-Kuo-Wilmar an RSPO member? Yes
Expanding into biofuels? Yes
Estimated size of known concession area:
Indonesia: 210,000 ha
+ 283,000 ha (with merger in process)
Riau 51,000 ha

Links to Riau deforestation and peatland degradation

Peatland:
3 concessions, estimated total area over 29,000 ha
Historic deforestation within the last two decades (1989–2003): 3 out of 5 concessions
Recent or ongoing deforestation (2001–2007): 4 out of 5 concessions
Recent fire hotspots (2005–2007): 4 (3 peatland) concessions
Global trade:
Wilmar exported almost 1 Mt of palm oil products in the first half of 2007. India and China took almost one-third of all exports. 151,000 tonnes (15%) was shipped to Germany, The Netherlands, Greece, Spain, Portugal and Italy.
Is Unilever using ADM-Kuo-Wilmar palm oil? Yes

ADM-Kuo-Wilmar and Cargill – trading Astra Agro destruction

Is Astra Agro an RSPO member? No
Expanding into biofuels? No
Estimated size of known concession area:
Indonesia 291,000 ha
Riau 77,000 ha

Links to Riau deforestation and peatland degradation

Peatland:
2 concessions, estimated total area over 20,000 ha
Historic deforestation within the last two decades (1989–2003): 4 out of 6 concessions
Recent or ongoing deforestation (2001–2007): 4 out of 6 concessions
Recent fire hotspots (2005–2007): 5 (2 peatland) concessions
Global trade:
ADM-Kuo-Wilmar shipped 15,250 tonnes to India and nearly 3,000 tonnes to China in the first half of 2007.
Cargill shipped nearly 2,000 tonnes of palm oil products from Astra Agro to Germany in the first half of 2007.
Do ADM-Kuo-Wilmar or Cargill know if they are selling Astra Agro palm oil to Unilever?
Once palm oil gets into the system, Unilever cannot know the source.
ADM-Kuok-Wilmar alliance and Cargill – trading Salim Group destruction

Is Salim Group an RSPO member? No
Expanding into biofuels? No
Estimated size of known concession area:
- Indonesia 230,000ha
- Riau 28,000 ha

Links to Riau deforestation and peatland degradation

Peatland:
- 1 concession, estimated total area 8,500ha
Historic deforestation within the last two decades (1989–2003):
  - 3 out of 4 concessions
Recent or ongoing deforestation (2001–2007):
  - 3 out of 4 concessions
Recent fire hotspots (2005–2007):
  - 3 (1 peatland) concessions
Global trade:
- Cargill shipped over 12,000 tonnes of palm oil from Salim Group in the first half of 2007, with the bulk going to Germany and The Netherlands.
- Various companies within the ADM-Kuok-Wilmar alliance also traded during the same period. Wilmar exported 1,000 tonnes of palm oil products from the Salim Group to the USA. Between them, Wilmar and Kuok Oils exported 2,500 tonnes to Singapore, where Wilmar owns a biodiesel plant.

Do ADM-Kuok-Wilmar or Cargill know if they are selling Salim group palm oil to Unilever?
Once palm oil gets into the system, Unilever cannot know the source.

ADM-Kuok-Wilmar alliance and Cargill – trading Duta Palma destruction

Is Duta Palma an RSPO member? Yes
Expanding into biofuels? Yes
Estimated size of known concession area:
- Indonesia 200,000ha
- Riau 104,000ha

Links to Riau deforestation and peatland degradation

Peatland:
- 5 concessions, total area over 55,000ha
Historic deforestation within the last two decades (1989–2003):
  - 5 out of 12 concessions
Recent or ongoing deforestation (2001–2007):
  - 7 out of 12 concessions
Recent fire hotspots (2005–2007):
  - 12 concessions
Global trade:
- Based on export data from the Dumai port in 2002, Duta Palma group subsidiaries sold about 30% of their palm oil to Cargill and about 12% to ADM-Kuok-Wilmar. The primary port destination was Rotterdam, where both Cargill and ADM-Kuok-Wilmar have refineries. A small volume also went to Hamburg in Germany, where both Cargill and ADM have refineries.
- In 2004, a third of Duta Palma’s exports went to Europe. The primary port destination was Rotterdam. According to confidential data obtained by Greenpeace, all of Duta Palma’s production for the first half of 2007 was shipped through Dumai. Over a fifth of this went to Europe and almost two-thirds to India. The primary destination ports were Rotterdam and Hamburg.
- Do ADM-Kuok-Wilmar or Cargill know if they are selling Duta Palma group palm oil to Unilever?
Once palm oil gets into the system, Unilever cannot know the source.

ADM-Kuok-Wilmar alliance, Cargill and Golden Hope – trading Musim Mas destruction

Is Musim Mas an RSPO member? Yes
Expanding into biofuels? Yes
Estimated size of known concession area:
- Indonesia 60,000ha
- Riau 31,000ha

Links to Riau deforestation and peatland degradation

Peatland:
- 1 concession, estimated area 30,600ha
Historic deforestation within the last two decades (1989–2003):
  - None
Recent or ongoing deforestation (2001–2007):
  - 1 concession
Recent fire hotspots (2005–2007):
  - 1 peatland concession
Global trade:
- In the first half of 2007 Cargill exported 14,500 tonnes of palm oil products from PT Musim Mas in North Sumatra, via Belawan port. Over 4000 tonnes were shipped to Germany.
- In the same period, Wilmar (Singapore) exported over 10,000 tonnes from PT Musim Mas, mainly to China.
- Golden Hope Plantations also bought from Musim Mas. In the first half of 2007, Golden Hope exported 23,500 tonnes of palm oil products from Musim Mas through Dumai and Belawan to Vietnam, Malaysia and The Netherlands.
- Golden Hope exported 4,500 tonnes of Musim Mas palm oil products to Rotterdam, where Golden Hope has an oil refinery. Until 2002, this refinery was owned by Unilever.
- Do ADM-Kuok-Wilmar, Cargill or Golden Hope know if they are selling Musim Mas palm oil to Unilever?
Once palm oil gets into the system, Unilever cannot know the source.
- In March 2006 Unilever’s Europe based union wrote to CEO of Unilever in Rotterdam warning that the Unilever products may ‘include as ingredients palm oil products from Musim Mas.’
FEEDING THE FOOD CHAIN

Riau, Indonesia

Small Holders

Plantation

CPO mill

CPO storage tanks

Port storage tanks (shared)

Shipping (shared)

Bulk storage (shared)
e.g. Rotterdam/Hamburg

Cargo ships

CPO transport

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Procter & Gamble uses nearly 1% of global palm oil production

‘Why travel when we’ve got the freshness of palm trees and sunshine all bottled up?’

Procter & Gamble, on one of its laundry detergents that uses palm oil

Greenpeace wrote to all the major palm oil users raising concerns about the contribution of palm oil from deforestation to climate change, and requesting information on companies’ supplies. Proctor and Gamble did not respond.

Ranked as the number one Household and Personal Products Company in Fortune’s ‘America’s Most Admired Companies’, Procter & Gamble has one of the strongest portfolios of brands in the world. It declares that ‘three billion times a day, P&G brands touch the lives of people around the world’. These brands – ranging from baby care to toothpaste to shaving cream to washing detergent to snack foods to instant drinks to batteries – include Pampers, Crest, Gillette, Head & Shoulders, Ariel, Pringles, Folgers and Duracell.

Many Procter & Gamble products contain palm oil derivatives, including iconic brands such as Ariel, Oil of Olay, and Pringles.

At the end of October 2007, Peter White, Procter & Gamble’s director of global sustainability, declared that the company is committed to ‘contributing to the sustainability of our planet’, and announced the company’s five year sustainability goals, including a commitment to ‘reduce CO2 emissions, energy and water consumption, and disposed waste per unit of production by an additional 10% each, contributing to a 40% reduction over the decade (2002–2012)’.

Since 2005 Procter & Gamble has been busy expanding its market share in palm oil products, setting up a joint venture in Malaysia and a ten-year supply contract in Indonesia. Total contracted production for Procter & Gamble since 2005 is over 320,000 tonnes a year, nearly 1% of global palm oil production.

In March 2005 P&G teamed up with Felda Palm Industries (Malaysia), which claims to be the world’s largest producer of palm oil and palm kernel oil. The 50/50 joint venture – FPG Oleochemicals – has led to the construction of a refinery producing 120,000 tonnes of palm oil derivatives each year. Procter & Gamble Chemicals markets the plant’s entire output. In 2005 Procter & Gamble signed a ten-year deal worth $1 billion with Sawit Mas Group to supply more than 200,000 tonnes a year of palm oil derivatives. These palm oil derivatives were to be used as raw materials in Procter & Gamble’s Beauty and Fabric Care businesses (ie cosmetics and detergents) around the world, and also marketed to the global chemical industry by Procter & Gamble Chemicals.

The Sawit Mas Group is a member of the RSPO. It owns more than 100,000 hectares of oil palm plantation land spread across the island of Sumatra and operates downstream processing facilities like palm oil mills, kernel crushing plants and refineries in Riau and North Sumatra. Greenpeace has identified two concessions on peat, one in Riau and one in Jambi province. The Riau concession, PT Flora Wanaha Tirta, had fire hotspots in 2005. The Jambi concession, PT Kaswari Unggul, is on peat with a depth of more than 4 metres according to official maps.

Nestlé is an RSPO member. In a response to Greenpeace’s letter questioning its sources of palm oil, Nestlé replied saying that it uses about 170,000 tonnes of palm-based oil per year – nearly 0.5% of world production. The company states that it buys from ‘reputable manufacturers who source their crude palm oil mainly from Malaysia and Indonesia’. Nestlé estimates that 95% comes from RSPO members – most of the major traders and refiners are RSPO members.

As no suppliers details were given by Nestlé’s Public Affairs people, Greenpeace asked Nestlé staff directly. Cargill was named as one of Nestlé’s suppliers, at least in Europe. Cargill staff have confirmed this.

KitKat is one of Nestlé’s leading global confectionary brands. According to the Nestlé website, KitKat is listed in the Guinness Book of World Records. Every second, 418 KitKat fingers are consumed worldwide. In fact, ‘every five minutes

NESTLÉ TRADING WITH CARGILL

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MAJOR NAMES IN THE FOOD INDUSTRY ARE USING TAINTED PALM OIL

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enough KitKats are manufactured to outstack the Eiffel Tower, while a year’s production would stretch around the London Underground more than 350 times. Making such a huge quantity of KitKats takes a lot of raw materials.

Greenpeace has been able to trace palm oil from Cargill’s refinery in Rotterdam to the Nestlé York factory in the UK. The factory receives about 100 tonnes of refined palm kernel oil (PKO) from Cargill every week, which is used in the manufacture of KitKat.

Other KitKat factories which use palm oil include ones located in Canada and Hershey (USA).

Kraft is a member of the RSPO.

In a letter to Greenpeace, Kraft admitted to using around 0.5% of worldwide palm oil production – putting it on a par with Nestlé, which uses about 170,000 tonnes of palm oil a year. Kraft’s palm oil supplies are sourced from Malaysia and Indonesia.

Kraft uses palm oil in crisps, cookies, crackers and chocolate fillings.

Its world-famous brands that use palm oil include low-fat Kraft cheese slices, Philadelphia cream cheese, as well as Oreo cookies.

McCain is a member of the RSPO.

McCain claims to be the world’s largest producer of frozen food and French fries, producing nearly a third of the frozen French fries produced internationally. The company is known for pizzas, desserts, oven meals and other frozen foods on six continents.

In response to a request from Greenpeace on the company’s palm oil supplies, McCain responded that it did not ‘use palm or palm kernel oil in McCain branded products’ in the UK. According to the UK website, however, McCain uses palm oil in its own brand Beer Battered Chips.

McCain did admit to using palm oil in food products it manufactures for a third-party fast food company that specifies a ‘4% blend of palm oil’. It claims this comes from RSPO member suppliers.

In Canada, the company uses palm oil in Delite chocolate, vanilla and marble cakes, Smiles Fun Shaped Potatoes, Microwave Pizza, amongst other products.

Pizza Hut is not an RSPO member.

Pizza Hut claims to be the ‘biggest Pizza Company on the planet’. It uses palm oil in chocolate fudge cake, profiteroles, banoffee pie, ice cream and other deserts.

Pizza Hut did not respond to a letter from Greenpeace asking the company to track the sources of its palm oil supplies.

Burger King is not a member of the RSPO.

Burger King is the second largest hamburger chain in the world (it has ‘millions of customers, who we love to bits’). It uses palm oil in its hamburger buns, chicken bites, hash browns, doughnuts and a host of other products.

Burger King did not respond to a letter from Greenpeace asking the company to track the sources of its palm oil supplies.

Cadbury Schweppes is a member of the RSPO.

Cadbury Schweppes claims to be ‘the world’s largest confectionery business’, selling products containing palm oil such as Cadbury’s Flake – the ‘crumbliest, flakiest chocolate in the world’.

In a letter to Greenpeace, Cadbury Schweppes asserted that it could identify all its palm oil suppliers to the UK, ‘all of whom are members of the RSPO’.

Danisco is a member of the RSPO.

Danisco claims to be the ‘world’s largest supplier of food emulsifiers’, its products used in ‘every second ice cream and cheese, every third box of detergent and every fourth loaf of bread produced globally’.

The company uses up to 30,000 tonnes of refined palm oil each year.
BIOFUELING
RAINFOREST
DESTRUCTION
'Two to nines times more CO$_2$ 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$_2$ from clearing the forest would take 60 to 270 years of growing biofuels (using current technologies).'

2007 King Review for the UK Government Treasury
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’. They praise biofuel use because of the notional reduction in CO2 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.’

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.

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

**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.’

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.

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. Soya and palm account for 80% of this in roughly equal proportions.

This means that replacing just 10% of world diesel demand for road transport would require over 76% 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).

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, almost doubling the target of the 2003 biofuel directive of 5.75% by 2010. The increased target is dependent on production being both ‘cost effective’ and ‘sustainable’.

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

**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. 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.

1 hectare of mature oil palm plantation yields the energy equivalent of 3.36 tonnes of diesel.

One tonne of vegetable oil is 1,100 litres; the energy in this is equivalent to 990 litres of diesel.
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. 306

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.’ 307

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

According to one RSPO member company, there is not enough rapeseed available to meet EU targets. 309 Of the alternatives, ‘vegetable oil sourced from palm oil is among the most widely and commercially available’. 310 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. 311

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. 312

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.’ 313

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

Estimates of increasing global production of the bulk vegetable oils and palm oil vary; 315 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. 316

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.’ 317

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. 318 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. 319 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. 320 Total capacity is 1.05Mt. Wilmar boasts that the location of the plants ‘provides easy access to abundant cheap raw materials’. 321 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. 322

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’. 323 Field investigation in July 2007 in Wilmar’s recently acquired holdings in Central Kalimantan documented active and recent evidence of forest clearance. 324

‘The bulk of Wilmar’s biodiesel capacity for FY 2007 has been pre-sold to buyers in Europe and the USA.’ 325

Currently diesel represents about 60% of road transport fuel consumed within Europe. 326 In 2005, Europe’s diesel consumption was 173Mt. 327 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. 328 This production from Wilmar’s biodiesel refineries will rely on harvests from almost 300,000 hectares of mature oil palm plantation. 329
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.330

However, an alliance between Cargill and Greenergy Biofuels Ltd331 is selling fuel blends of 20%, 30% or 50% biodiesel,332 which use palm oil, soya and rapeseed oil as feedstocks.333 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.’334

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.335 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’.336

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

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.’340 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.’341

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 CO₂ emissions linked to transport and energy use, European governments are driving ecosystem destruction and are thereby responsible for vast and significant CO₂ emissions through forest burning and peat swamp drainage to plant oil. CO₂ 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.342

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.’343

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 CO₂ 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%.344

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 CO₂ losses if grassland is ploughed up or forest cleared. These losses can be expected to outweigh CO₂ gains from biofuels for many years.’345 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.’346

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 CO₂ 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.’

**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. India has set a target of 20% of diesel from biofuels by 2012. Already, China and India are the most significant palm oil consumers in the world, using about 25% of palm oil production.

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. By 2050, these two countries are on track to have 1.1 billion cars, nearly double the total global number of cars in 2000.

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), 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.

Third largest company in the world 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. HSBC is a principle banker for the parent holding company for HKE. HSBC also holds up to a quarter of shares in one Sinar Mas subsidiary.

Documents obtained by Greenpeace 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, Sinar Mas has already formed 14 subsidiaries.

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

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.
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.365

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

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.367 Between Sinar Mas and these other players, therefore, over 2.5 million hectares of land will be dedicated to biofuel production.368

Where will they go?

Indonesia's Ministry of Forestry has already earmarked up to 9 million hectares of forests in Papua for conversion.369 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.370

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.’371
Science 17 August 2007

As noted above, the Duta Palma group is one of Indonesia’s ten largest palm oil refiners372 and a member of the RSPO. One of Duta Palma’s subsidiaries373 is constructing a biofuel refinery with a capacity of 200,000 tonnes a year.374

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.375

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.376

Were this volume of carbon released to the atmosphere, it would be equal to 2% of the annual global GHG emissions from road transport,377 or on a par with the annual GHG emissions of the UK’s ten most inefficient coal power stations.378 The area in question is tiny: 0.0001% of global land area379 – about one-tenth the size of the city of Jakarta,380 or two-and-a-half times the size of Manhattan Island, New York.381

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
NASA climate scientists warn us that ‘continued rapid growth of CO₂ emissions and infrastructure for another decade’ may make halting high-risk increase in global temperatures ‘impractical if not impossible’.382

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.383

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 CO₂ 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 CO₂ 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.

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.’384

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.

Wetlands International, 2006

DEFUSE OR DETONATE?

The simplest and most effective measure to prevent a further increase in fires and CO₂ emissions is thus by conservation of remaining peat swamp forests and rehabilitation of degraded peat-swamp forests.’
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.’

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 CO₂

According to an IPCC report, up to 2Gt CO₂ (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 CO₂.

Significantly, this figure does not include potential to halt emissions from peatland and other bog fires.

Cut two: Stop Indonesian peatland fires, establish a moratorium on peatland conversion:
annual emissions savings – 1.3Gt CO₂

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 CO₂

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 CO₂ a year, for a one-off investment of about $720,000 (this equates to $0.22/tonne). This is small change in global climate change terms.

Total cuts: Potential annual emissions savings: up to 3.8Gt CO₂. 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.’

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.
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 0.65Gt carbon, or 1.8Gt CO₂, Santilli et al. (2006); 2. Table 1. Carbon emissions from fossil fuel, tropical deforestation, forest fires (Brazil and Indonesia), fires and emission reductions targeted by the Kyoto Protocol
5 Land areas of Taiwan and Switzerland are 3.5 and 4 million hectares respectively. CIA (2007)
7 Based on emissions of 10.18Gt CO₂ from fossil-fuel power stations in 2004. IPCC WGIII (2007) 104. ‘Figure 1.2: Sources of global CO₂ emissions, 1970-2004’ (only direct emissions by sector)
8 1.4 million hectares. IPCC (2006)
10 RSPO (2007b)
11 Adam Harrison, WWF, letter to Greenpeace, 19 October 2007
12 Dave Rogers, Cargill Europe, letter to
13 Gavin Neath, Unilever, letter to Greenpeace, 2 October 2007
14 Hilary Parsons, Nestlé, letter to Greenpeace, 11 October 2007
15 Righelato, Renton and Dominick V Spracklen (2007)
16 WRI (2007)
17 IPCC WGIII (2007): 11
18 IPCC WGIII (2007): 23
19 IPCC WGIII (2007): 213
21 IPCC Fourth Assessment report Working Group III states that to keep temperature rise below 2°C, global emissions need to peak by 2015 and then be reduced by 50-85% by 2050 (from 1990 levels). This means industrialised countries cutting their emissions by 25-40% by 2020 and by 80-95% by 2050. UNFCCC (2007): p5. Table 1. ‘Characteristics of greenhouse gas stabilization scenarios’; p20, Table 4. ‘Estimates of emission reductions by Annex I Parties using various methods’
22 IPCC (2000): 4. Table 1. ‘Global stocks in vegetation and soil carbon pools down to a depth of one metre’ gives atmospheric carbon storage as 760Gt and forests including forest soils as 1,146Gt.
23 IPCC WGIII (2007): 104. ‘Figure 1.2: Sources of global CO₂ emissions, 1970-2004’ (only direct emissions by sector)
24 IPCC WGIII (2007): 213. States that there are several major carbon stocks that are at a high degree of risk from projected unmitigated climate and land-use changes
25 World Bank (2007)
26 FAO (2005)
27 Greenpeace SE Asia, ‘Indonesia makes it to 2006 Guinness World Records as fastest country to cut its greenhouse gas stabilization targets’; p20, Table 1, ‘Characteristics of countries cutting their emissions by 25-40%’
28 2.8Gt CO₂ per year through deforestation during the 1990s; 3Gt CO₂ through deforestation and fossil fuel use WRI (2007) Climate Analysis Indicators Tool vs 4.0
30 CIA (2007)
32 Total area in 2006 was 5.5 million hectares. IPCC (2006)
33 Cited in IPCC (2007): 205: 7Gt of electricity according to the industry data 3% of all oil palm plantations are established in primary forests and 63% in secondary forest and vegetation.
35 FWI/GFW (2002): 43
37 Legowo (2007)
38 Colchester et al. (2006): 25. Table 1. 2 Provincial government plans to expand oil palm plantations’
40 Wetlands International (2007)
41 FAO (2006): 56
42 WWF (2007b): 5
43 Based on an Indonesian average yield of 3.7 tonnes CPO per hectare of mature oil palm plantations. FAO (2005)
44 OECD-FAO (2007)
45 See for instance Unilever, ‘Unilever’s position statement on renewable energy and biofuels.’
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 CO₂ 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 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.
49 1.26 Gt CO₂ (90% of annual 1.4 Gt CO₂) from peatland fires out of 1.8 Gt CO₂. Source: Hooijer et al. (2006): 29
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 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.
52 Hooijer et al. (2006): 1
53 UNEP (2002)
54 Hooijer et al. (2006): 1
55 Based on emissions of 10.18Gt CO₂ from fossil-fuel power stations in 2004. Source: IPCC WGIII (2007): 104. ‘Figure 1.2: Sources of global CO₂ emissions, 1970-2004’ (only direct emissions by sector)
56 Page et al (2002); Hooijer et al. (2006): 1
57 Hooijer et al. (2006): 6
58 Based on emissions of 10.18Gt CO₂ from fossil-fuel power stations in 2004. IPCC WGIII (2007): 104. ‘Figure 1.2: Sources of global CO₂ emissions, 1970-2004’ (only direct emissions by sector)
59 Hooijer et al. (2006): 6
60 UNEP (2002)
61 UNEP (2002)
62 Hadley Centre (2007)
63 NASA (2007)
Page 66

64 Page et al (2002) estimates tropical peatland carbon storage at 60kg/m², or 600 tonnes per hectare at 1m depth of peat – deeper soils would store even larger quantities of carbon.

65 Wetlands International (2006a): 2

66 Wetlands International (2006a): 4

67 Scottish Mining Museum (2007)

68 Hadley Centre (2007)

69 Wetlands International (2006a): 4

70 Hooijer et al (2006): 18, Figure 12

71 Hooijer et al (2006): 16, Figure 12

72 Germer and Sauerborn (2007): 1


75 Hooijer et al (2006): 26


77 Hooijer et al (2006): 26


79 WRI (2007)

80 WRI (2007)

81 5 million hectares of largely forest land in ten months. Goldammer and Hoffmann (2001)

82 The report estimates that between 0.81 and 2.57Gt of carbon were released to the atmosphere in 1997 as a result of burning peat and vegetation in Indonesia, a volume equivalent to 13–40% of the mean annual global carbon emissions from fossil fuels. Source: Page et al (2002): 61

83 Forestry Act No. 41/1999; Plantation Law 19/2004, article 26 states: ‘any entrepreneur of plantation business is not allowed to open and/or manage its land by burning it, which can result in pollution and destruction of environment.’ Source: Sawit Watch et al (2007)

84 Wetlands International (2007)

85 Based on area of 4,043,601 hectares and 2.57Gt CO2 of stored carbon. Wahyunto et al (2003): 34

86 Wahyunto et al (2003): 34

87 Land areas of Taiwan and Switzerland are 3.5 and 4 million hectares respectively. Source: CIA (2007) World Factbook

88 Wahyunto et al (2003): 34

89 Based on 14,603Gt of carbon stored in Riau’s peatland area (equivalent to 55.53 t CO2) and 493Gt CO2 e annual global GHG emissions in 2004. Wahyunto et al (2003): 34, IPCC WGIII (2007): 3


92 Greenpeace investigations 2006-2007

93 IPCC (2006)

94 WWF (2006b)

95 IFOC (2006)

96 499,000 hectares logging, 767,000 hectares timber plantations and 882,000 hectares palm oil concessions. Hooper et al (2006): ‘13 Table 4

97 WWF (2001)


99 Copy held by Greenpeace

100 Annual deforestation rate at 1.87 million hectares a year. FAO (2006): 157 Table 4


103 37.7% Source: Hooijer et al (2006): 14 Figure 10


106 Greenpeace investigations

107 Credit Suisse (2006)

108 Greenpeace investigations June-October 2007

109 Duta Palma, ‘Dutapalma Nusantara and Subsidiaries’ www.dutapalma.co.id/plant.htm accessed 28/10/07

110 Sizes of concessions listed are based on spatial analysis of the maps attached to the permits of the respective concessions.

111 Until February 2007, the relevant legislation was Ministry of Agriculture Decree ‘Guidance for Plantation Permits (Pedoman Perizinan Usaha Perkebunan)’ No 357/ Kpts-4/3K/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 Agriculture Decree ‘Guidance for Plantation Permits (Pedoman Perizinan Usaha Perkebunan)’ No 26/Permentan/ OT.432/2007 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 10,000 ha”

112 PT Kencana Amin Tani (8,766ha), PT Banyu Bering Utama (5,477ha), PT Berbah Aneka Yasa [3,960ha], 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 of 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 BBUL, PT Palma Satu and PT BAY are marked as being on 2-4 metre deep peat, while PT KAT is on mineral soil.

116 ‘Kawasan Induk’

117 Wahyunto et al (2003); these concessions cover 30,042ha

118 Friends of the Earth (2002)

119 Greenpeace investigation June-October 2007

120 Greenpeace investigation June-October 2007

121 Greenpeace investigation June-October 2007

122 IUCN (2007)

123 RSPO (2007b)

124 Adam Harrison, WWF, letter to Greenpeace, 19 October 2007


128 Stern (2006)

Greenpeace investigations June-October

Evidence held by Greenpeace

Cargill, 'Palm Products in Malaysia’

Evidence held by Greenpeace

Clay (2005)

Unilever, 'Our Programmes'

Clay (2005)


Unilever, ‘Our Programmes’

Evidence held by Greenpeace

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314 USDA FAS (2007): 4 ‘Table 3: Major Vegetable Oils: World Supply and Distribution’ - as opposed to 29% for soya

315 according to the FAO production is set to double from 2000 levels by 2030, from 25.6Mt to 54.2Mt, rising to 77.2Mt by 2050. FAO (2006) - 56; the OECD predicts a doubling of production on 2000 levels by 2015. OECD Statistics (2007) ‘World palm oil production’ accessed 15/10/07

316 Vegetables oils, here defined as rapeseed oil, soyabean oil, sunflower seed oil and palm oil, except in Japan where it excludes sunflower seed oil, will rise by 31.7Mt; palm oil by 14.9Mt. OECD-FAO (2007b)

317 Unimills (2007a)

318 See for instance Greenpeace (2006a)


320 Wilmar (2006): 26

321 Wilmar (2006): 26

322 From 100,000 ha in the first half of 2006, Wilmar, ‘Wilmar Embarks on Rapid Expansion Plans’ Press release 28 August 2006; Wilmar; ‘Wilmar secures all approvals for US$4.3 billion merger and acquisitions’ Press release 22 June 2007


324 Field investigation by Cockroach documented impacts at PT Kerry Sawit Indonesia, PT Mustika Sembuluh, PT Serana Tritan Permata (formerly PT Rungau Alam Subur) as well as other concessions in the Sembuluh area

325 Wilmar (2006): 26

326 Petrol 108Mt + diesel 173Mt = 281Mt; OECD/IEA (2007)

327 OECD/IEA (2007)

328 The energy content of 1.01Mt of biodiesel is equivalent to 0.9Mt of mineral diesel.

329 Average harvest from mature oil palm plantations in Indonesia is 3.7 tonne/hectare. Mielke Oil World (2007)

330 Letter from RSPO member, 9 October 2007

331 In 2006 Cargill took a 25% stake in Greenenergy Biofuels Ltd. Greenenergy, ‘Biodiesel production’ www.greenenergy.com/company/history.html accessed 24/10/07

332 Greenenergy, ‘Biodiesel, B5, B30, B20 and B5’ www.greenenergy.com/Products/biodiesel.html accessed 24/10/07


335 Greenenergy, ‘Biodiesel production’ www.greenenergy.com/company/history.html accessed 24/10/07

336 Letter from Tesco, 23 October 2007

337 Greenenergy, ‘Biodiesel production’ www.greenenergy.com/company/history.html accessed 24/10/07

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344 In the period 2000 - 2020, energy demand in the EU-25 road transport sector is projected to grow from 286Mt to 331Mt in 2020 (an increase of 35Mt). Under this business-as-usual scenario, meeting the biofuel target of 10% in 2020 equates to 33Mt – less than projected growth of 35Mt. Mantzos and Caspos (2006): 75

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360 Copy held by Greenpeace
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376 one cubic metre of peat contains about 60kg of carbon, according to Hooijer et al (2006):1 – this represents 600 tonnes per hectare per metre depth. 14,190 hectares at an estimated average of 3 metres deep therefore holds 25.5 million tonnes of carbon, equivalent to 94 million tonnes CO2.
377 In 2004, emissions from road transport amounted to 4.62Gt. IPCC WGIII (2007): 104. Figure 1.2: Sources of global CO2 emissions, 1970-2004 (only direct emissions by sector).
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387 IPCC WG III (2007): 631
388 Madgwick (2007): 13-14: 500,000 (this equates to 0.15/tonne); see also Wetlands International (2006a)
390 Successful implementation will require: a) a national approach to accounting for RED, not a project-based approach which suffers from the problem of ‘leakage’ (ie destruction shifting from one area of the country to another); b) no trading of RED credits in an international carbon market, to avoid these reductions being used as an excuse for developed countries doing nothing at home; c) full participation of indigenous peoples and local communities to ensure that their rights and livelihoods are respected and the benefits of forest protection are equitably shared; and d) independent monitoring and verification.
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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, CO₂ and CO₂ equivalent (CO₂e) – Climate change potential may be measured in three sets of units depending on context: weights of carbon, of CO₂ and of CO₂ 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 CO₂ when referring to emissions. 1kg of carbon converts to 3.67kg CO₂ (this is directly equivalent to the difference in weight per carbon atom: carbon has an atomic weight of 12, CO₂ a molecular weight of 44 – one carbon atom plus two oxygen atoms). CO₂ equivalent (CO₂e) 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 CO₂ required to produce the same effect.

CO₂ – 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)
h/a – 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.
Mi – Megatonnes (million tonnes)
NGO Non-governmental organisation
OECD - Organisation for Economic Cooperation and Development
PKO – Palm Kernel Oil

t – Tonnes
UN – United Nations
UNFCCC – United Nations Framework Convention on Climate Change
USDA – United States Department of Agriculture
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World Bank/ UK Government funded report, 2007
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.