

Biofuel Assessment

Prepared for Tesco

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Executive Summary

This report takes a high level overview on the impact of biofuels on the environment and the economy through a meta analysis of the main reports and data sources that have been issued from bodies such as the World Bank, the UK government and other key academic sources.

The reports demonstrates that:

- Biofuels are inherently unsustainable.
- They are not compatible with the urgent necessity to stabilise Greenhouse gases in atmosphere.
- That there is no evidence to support claims of sustainability, on the contrary there is unequivocal evidence to support the environmental damage that they are causing.
- That the onus must be placed on the biofuel industry to support their claims of environmental stewardship, rather than on the environmentalists to demonstrate the damage caused.
- That the economic effects are likely to be catastrophic and will far outweigh any benefits derived.
- That second and third generation solutions will bring their own problems, which will potentially be larger than those caused by first generation solutions.
- Tesco can take a leadership position by being the first large corporation to abandon biofuels.

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Overview

This report has been prepared to highlight the extraordinary damage that biofuels is imposing on food production, the environment and our economic system.

The report highlights the severity of the current situation on global warming and the necessity of protecting what is left of the biosphere to provide some chance of allowing CO₂ to stabilise.

The issues surrounding biofuels are now increasingly profound. They concern human rights, food security, water security, environmental degradation and economic stability. They are of such a profoundly serious nature that they challenge the very concept of the global economy.

The report is targeted at the current dilemma facing Tesco. Tesco has previously stated that they “*Wanted to be the market leader*” in biofuel on the belief that biofuels would “*help customers reduce their CO₂*.” As part of this marketing strategy they invested in Greenergy and are still the only main retailer to hold a significant stake in a biofuel company. Since this investment, Tesco have benefited financially from Greenergy's extraordinary growth. However, following protests against the sale of biofuels, Tesco have now retreated from their initial position on benefits of biofuel with the claims on the web site now replaced with the statement that “*The science of biofuel is not clear.*” However they continue to sell biofuel and support Greenergy through their initial investment and procurement contracts, despite the increasing evidence that the pursuit of biofuel poses unacceptably high risks to the environment and the rest of the economy. On an issue as serious as this, a precautionary principle should apply, such that no further biofuel sales are made unless the evidence is overwhelming that it is environmentally beneficial. On the contrary, all the most robust analysis and assessment of biofuels that is currently available point unequivocally the other way, that there is absolutely no environmental benefit at all. The claims remaining in the literature for environmental benefits are the constructs of marketing departments rather than scientific analysis.

There is now an enormous amount of literature available on biofuel. It is therefore not possible nor appropriate within this documents to comment on all the available literature and cover all issues; instead this document is intended assist the decision makers of Tesco with the strategic problems that biofuel poses by focusing main governmental and institutional reports on biofuels. The analyses are augmented by appropriate academic research.

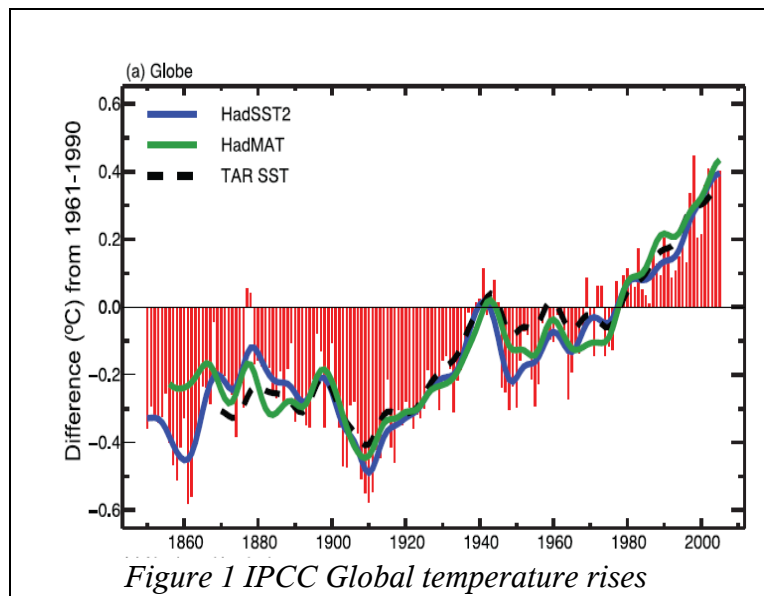
Main governmental data sources that the report considers are:-

- Gallagher Report
- Renewable Fuel Agency (RFA) report on sustainability.
- World Bank Assessment on biofuels

Our climate today and the Photosynthetic ceiling

Biofuel is portrayed as being carbon neutral by its supporters. However, even in a perfect world, where biofuel could be converted into petrol or diesel, with no energy required and no CO₂ emissions from the associated land change use, then biofuels would still be an environmental and economic disaster. The fundamental failure of biofuel as an environmentally sound solution to our energy needs is that it inherently reduces the ability of the global climate control system to recover from change and perturbation. In reality, almost as much energy is needed for processing and shipping as is produced¹ thus further destroying its claim as an environmentally effective alternative. In essence the fault lies with a combination of poor terminology, poor understanding of the science of climate change and wishful thinking.

The fundamental assumption that carbon neutrality makes is that the current level of CO₂ in the atmosphere is sustainable. It is not. The evidence in the IPCC reports² shows that the temperature of the planet is now rising extremely rapidly and dangerously, see Figure 1. Since warming started around about 1900, the temperature has increased approximately 1°C. This is already leading to profound change such as melting ice caps and methane releases in the Arctic regions. The graph of global temperature shows the rises occurring some 50 years after the



start of the industrial revolution. This leads to the conclusion that there is a time lag of up to 50 years between cause and effect. Thus the temperature rises that we are experiencing today are the result of CO₂ emissions from perhaps 30 years ago, and so much more warming is already in the pipeline.

The forecasted temperatures within the IPCC report, show temperature rises up to 6°C if we maintain a business as usual approach. This will be prohibitive to most, if not all, life on earth. These awful predictions are now widely considered to be underestimates of the potential temperature rises.

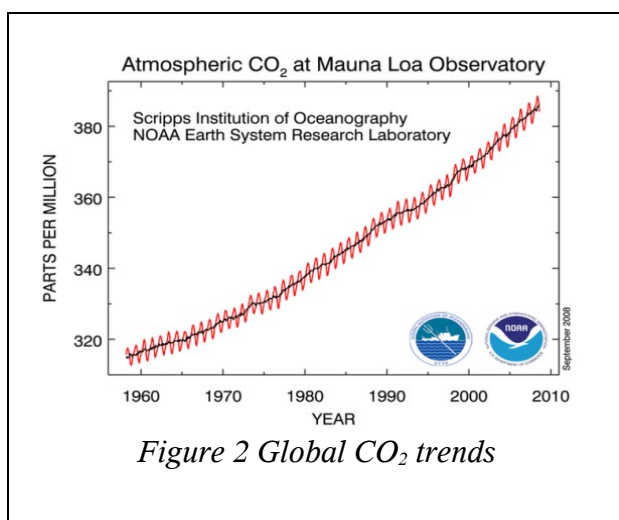
1 <http://petroleum.berkeley.edu/papers/Biofuels/NRRPaper2.pdf>

2 <http://www.ipcc.ch/>

The reason for this underestimate is that the models do not include many of the feedback mechanisms such as Amazonian die off and methane release that will act as tipping points. More ominously, the IPCC models do not include what is known as second order effects. These are effects where by one feedback system triggers another, which triggers another, so leading to an extreme domino effect, where the cumulative feedbacks not only trigger the other effects but accelerate their individual contributions. The state of the science on feedback systems is still poor as new feedback systems are continually being discovered, such as the impact of new insect outbreaks³, which are unable to be incorporated into existing models.

To put the current CO₂ levels in perspective; the current level of CO₂ emissions is 385 ppm, see Figure 2. This is far above range of 180ppm to 290ppm that the climate had stabilised at for the past 650 thousand years⁴ and which has been established from the Vostok ice core readings.

This severity of the problem is severely amplified by the simultaneous addition of greenhouse gases such as methane, nitrous oxides, CFCs, etc at the concentrations of today. These have global warming effects ranging from 30 to 50,000 times greater than that of CO₂. When these are incorporated into assessments of CO₂ loading in the atmosphere the equivalent level rises to 455ppm⁵. This is even further beyond the levels that the environment has evolved around and is above the limit of 450ppm⁶ that many scientists and mathematicians have established and agreed is the tipping point for runaway climate change.



More ominously, the rate of increase is increasing, see Figure 3. Calculations show that if the increasing rate of increase is factored into the rising emissions, by 2032 the CO₂ concentration alone would be above 450 ppm. This contrasts with the evidence that emissions need to be reduced to 350ppm to avoid irreversible damage to our planet⁷.

It is now evident that we are in totally uncharted territory. If we allow our greenhouse gas concentrations to remain at today's levels, we should expect nonlinear responses from the

3 <http://secure.ntsg.umt.edu/publications/2008/Run08/652.pdf>

4 <http://www.realclimate.org/index.php?p=221>

5 http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf

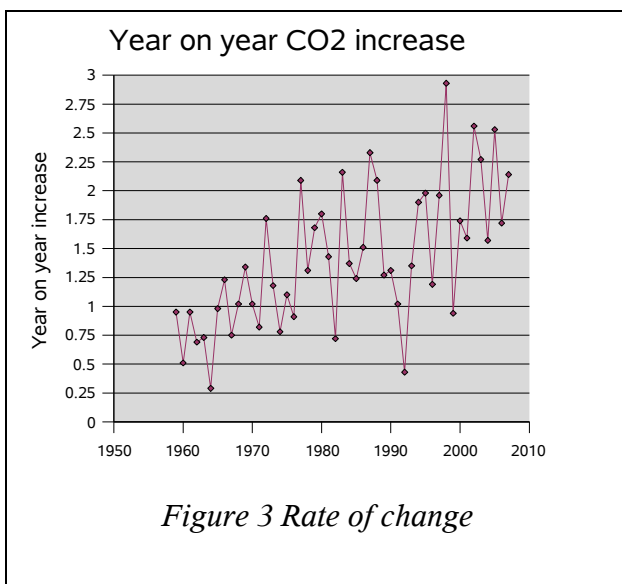
6 The Revenge of Gaia, James Lovelock

7 http://www.columbia.edu/~jeh1/2008/TargetCO2_20080407.pdf

environment, as the normal control mechanisms are forced to operate far beyond their normal bounds. These non-linear responses will manifest in terms of sudden and irreversible step changes in global average temperature.

It is now inconceivable that we will be able to avoid runaway climate change. We have breached tipping points with total abandon and are largely continuing to ignore the warming signs. The only question remaining is how bad it will be and what level of life the planet will be able to support after the worse is done and the climate settles in its new equilibrium position.

We thus have an onus now to do what we can to ensure that the planet remains habitable for at least some forms of life and does not enter a total runaway scenario in the same way that Venus has.



The only opportunity for our planet being able to stage some sort of recovery is for as much biosphere to be left with the ability to absorb the excess CO₂ from the atmosphere. There are two main mechanisms for this. One is absorption of CO₂ by the sea. The other is absorption of CO₂ by the planet's land based vegetation.

Unfortunately, the sea surface is now becoming fully saturated with CO₂. When CO₂ is absorbed in water it produces carbonic acid, and this is changing the ocean from being slightly alkali to slightly acidic. Once this threshold is crossed there will be a major collapse in the productivity of the sea. The cause of this collapse will be the loss of the pteropods whose shells subsequently form the chalk deposits and sequester CO₂, see Figure 4. In addition to this, as the surface temperature of the sea increases due to global warming, it is less and less able to absorb CO₂ in the same way that gas builds up in a hot radiator as hot water does not absorb gas. In Figure 3 the large spike in CO₂ around 1998 was due to the El Nino which warmed the surface of the Pacific Ocean and reduced CO₂ absorption.



Figure 4 Sequestered CO₂ in the form of chalk

Thus land based vegetation must be protected as it will be the main mechanism to reduce CO₂. Unfortunately, large parts of the world's vegetation are being lost through deforestation, industrialisation and agriculture. It was hoped that the remaining vegetation would respond to the higher CO₂ levels by increased growth rates, however this has been disproved. Plant growth is determined by water and nutrient availability as well as by CO₂ concentration. The hotter summers in the Northern Hemisphere have led to a unsuspected browning, thus reducing CO₂ uptakes^{8 9}.

Thus it is vital, that as a society, our first priority is to ensure the health of the remaining ecosystem and to protect it from further damage, rather than to consider it as a resource for further exploitation.

Figure 5 shows the Net Primary Productivity of the planet. This is a measure of the amount of CO₂ converted by plant photosynthesis to biomass minus the plant respiration. It is a fundamental measure of the planet's ability to absorb CO₂ gases. Purple indicates high productivity, red indicates low productivity and the image maps out the planet's ability to maintain its environment.

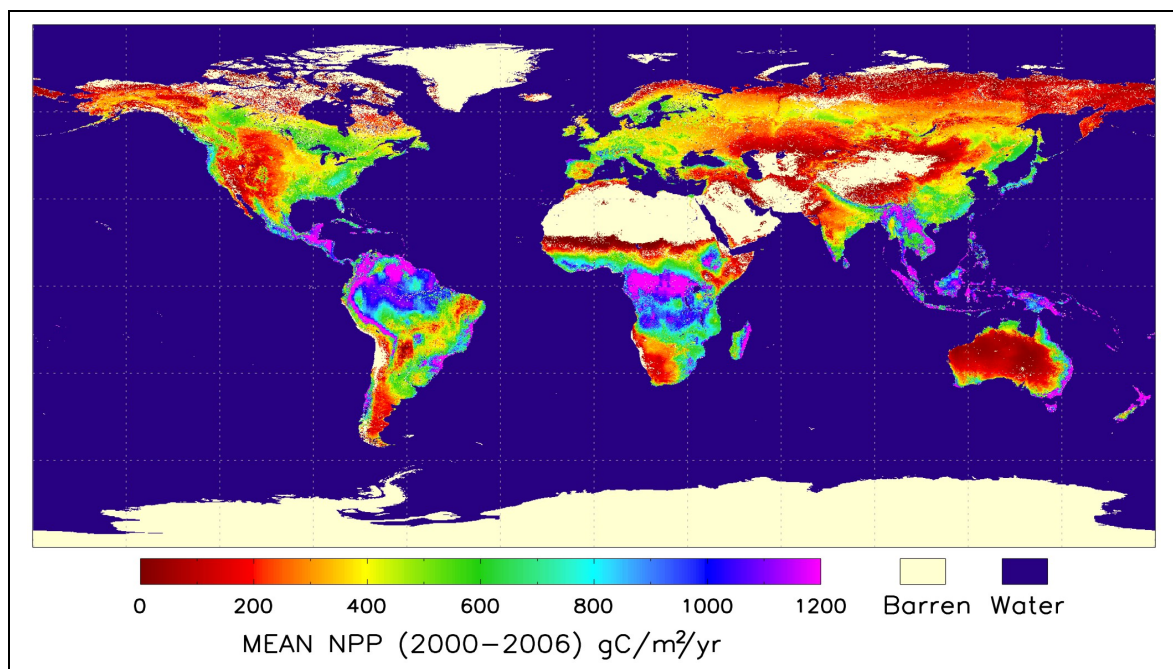


Figure 5 Net Primary Productivity

8 http://berkeley.edu/news/media/releases/2005/08/02_carbon.shtml

9 <http://www.pnas.org/content/104/11/4249.full.pdf+html?sid=36b0faad-5d1d-42fa-bf25-45a3c484b7b9>

The most productive part of the planet is the tropical belt, thus most of the CO₂ absorption will take place in these regions. This unfortunately is where much of the biofuel is either being grown or proposed to be grown in the future. So the growth of biofuel is simply displacing the most critical parts of the planet's control system to restore its CO₂ levels. Figure 2 and Figure 3 already demonstrate that the earth is incapable of absorbing the current level of emissions.

As a result, two arguments regularly used by biofuel supporters and manufactures are false: The argument that the tropics are the ideal place to grow biofuels is false because it reduces the planet's most productive area for sequestration of CO₂, and the idea that there is abundant waste ground where biofuel can be grown is false because we need all our land to be productively reducing our CO₂ emissions. By Greenergy's own admission, "*We do buy Brazilian bioethanol.*"

To maintain the myth that biofuels can be grown without destabilizing the control systems that have inherently sustained life on earth for billions of years is to argue that the Earth can provide infinite and instantaneous supplies of pure air, fertile soil, clean water and all necessary nutrients, whilst at the same time feeding 7 billion people and satisfying all their demands for travel, entrainment and products.¹⁰

In this context claims of carbon neutrality are nonsense. What is far more important is the total land footprint, the quality of the land that is used and the remaining ability of the planet to restore its atmosphere to equilibrium.

¹⁰ <http://www.hubbertpeak.com/Patzek/CanWeOutliveOurWayOfLife20070809.pdf>

Comments on the Gallagher report¹¹

The Gallagher report was commissioned by the UK government to review the direct effects emerging from the thrust towards biofuel, namely:-

- Land use change
- Impact on greenhouse gas life cycle emissions
- Biodiversity loss
- Rising food prices

The general content of the report is damning with respect to the long term viability and sustainability of biofuels.

The report highlights the massive CO₂ releases that are being brought about by land use changes. The report warns that land use changes come about as an indirect consequence of biofuel, such that biofuel grown in this country means that food has to be grown elsewhere (section 3.6). The report states “*Mechanisms do not yet exist to accurately measure, or to avoid, the effects of indirect land-use change.*” In the worse case, the land use changes are resulting in carbon emissions that require a 400 year payback. It is impossible to imagine how these gas injections into the atmosphere will ever be removed when the forests that would normally sequester the CO₂ are simultaneously destroyed. The report does not address this issue. Thus the indirect effects mean growing biofuels in this country is as environmentally damaging as growing them abroad.

The report goes on to say that biofuels can be grown on land that is “*idle and marginal,*” but later qualifies this as saying that “*there is enormous uncertainty around the estimates*” of the available idle land. The report suggests that idle land would be found in areas that are arid, too hot or too cold. It does not highlight that these areas are the least fertile in the world and would not be able to support the plant growth that the biofuel industry is dependent on, hence the reason why much biofuel is grown in places such as the tropics. Fundamentally, there is no idle land in the world. What is not used for food production is needed to maintain the atmosphere.

The final omission, is that where the report suggests that the biofuel industry can be expanded it is not backed up by factual evidence and even the executive summary acknowledges biofuels complicity with deforestation, rising food prices and dubious climate change benefits.

Despite this, the report concludes “*A slowdown in the growth of biofuels is needed.*” This is a blatant oxymoron. Slowing down the growth merely delays the time taken to reach to a critical point. It does not stop the critical point from happening. To avoid the problems that the report

¹¹ http://www.dft.gov.uk/rfa/_db/_documents/Report_of_the_Gallagher_review.pdf

highlights, a moratorium is needed as the report actually recognises.

Of the eight conclusions in the executive summary section the last one is the most telling, and most worrying. It states *“Large areas of uncertainty remain in the overall impacts and benefits of biofuels. International action is needed to improve data, models and controls to understand and to manage effects.”* The report's authors therefore acknowledge that the data upon which they are making their recommendations is flawed. They have therefore completely abandoned any notion of the precautionary principle which is vital given the magnitude of the risks associated with biofuels policies.

As a consequence, more money will be poured into biofuel schemes, either directly or indirectly. More jobs will be tied into the industry, therefore making it progressively more and more difficult to extract ourselves from supporting the industry as time progresses. The more this process continues that harder the industry will try to lobby to suggest that it can be made sustainable.

Despite the damning evidence of the Gallagher report on the impact of biofuels, the reports conclusion, (section 8.3) states, *“In the light of recent evidence that emphasises the potential negative effects of biofuels, there have been calls for an immediate stopping or freezing of government support for biofuels. The new evidence presented in this review provides some support for these calls. However, a moratorium - either the removal of all support or a freeze on the current levels of fuels in the market - would have a number of implications. Specifically, a moratorium is likely to lead to a stagnant, unprofitable industry.”*

It is clear from this statement that the report's conclusions, that biofuel targets should be increased but more slowly, are not based on the economic or environmental aspects associated with biofuels, but based entirely around the wishes of the biofuel industry. Thus, on the basis of this report, no company associated with biofuel industry can claim environmental credentials.

Given the evidence elsewhere in the report, there is little economic or moral justification to maintain an industry such as this, let alone provide it the legislative support it needs to survive and develop.

It is telling that the Gallagher report was prepared with the help and input from the Renewable Fuels Agency (RFA). On the RFA¹² web site the opening paragraph states *“The RFA has been set up by the Government to implement the [Renewable Transport Fuel Obligation \(RTFO\)](#).”* It is therefore hardly surprising that the report came up with the conclusion to pursue biofuels when it is being prepared by individuals whose remit is to introduce the RTFO.

12 <http://www.dft.gov.uk/rfa/>

Current Biofuel Industry Performance on Sustainability

The RFA has now started issuing reports on the sustainability of UK biofuel. The first report was published in April/May of this year¹³.

This report shows a shocking lack of audibility. By its own admission only “19% of biofuels met environmental standards, compared to a target for the year of 30%.”

Clearly a target of 30% is low when biofuels were being sold by the industry as an environmentally friendly alternative to fossil fuels. To undershoot this low target by 11% is truly damning. Furthermore, the RFA report openly acknowledges that it does not take into account additional CO₂ emissions from land use changes. When this is incorporated into the analysis, it is inevitable that the 19% currently claimed as being sustainable will go down further.

Figure 6 and Figure 7 have been extracted from the April/May report and clearly indicate how little is actually known about the sourcing of UK biofuels. Figure 7 shows that even the basics, such as the country of origin or previous land use, are not understood.

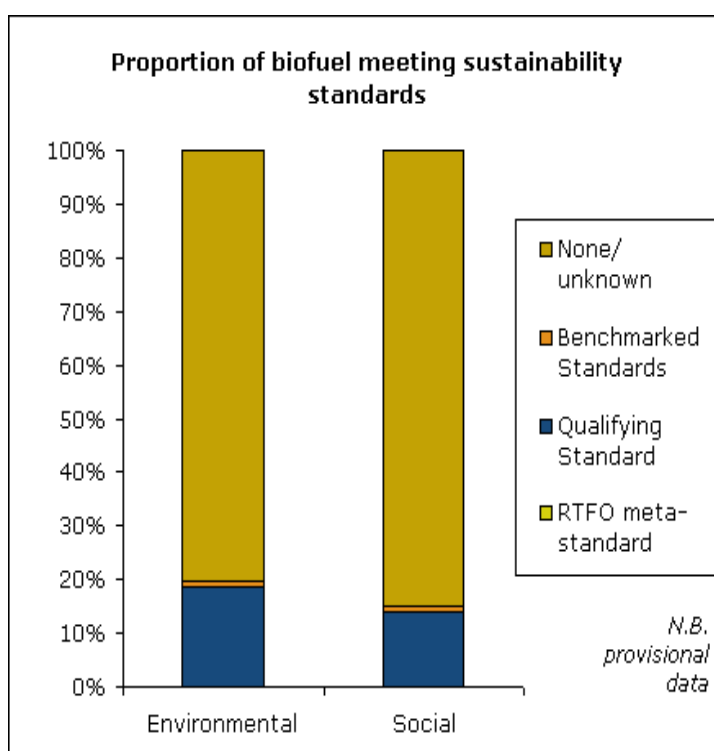


Figure 6 RFA Sustainability

These graphs raise a serious issue with conclusion eight of the Gallagher report, which states that “International action is needed to improve data, models and controls to understand and to manage effects.” The evidence from the data currently available suggests this will be an impossible task. The poor data quality is not necessarily due to poor data collection, but more likely due to the inherent unavailability of data. To try and imagine that robustly auditable data could be collected on the scale and magnitude that would be necessary to ensure that the biofuels sources are consistently sustainable is an impossible wish. As we can not even determine which country much of our biofuel comes from, it would therefore be impossible to expect that we would be able to put in place a process that would ensure reporting down to the levels of detail needed to verify sustainability as this would require the

¹³ <http://www.dft.gov.uk/rfa/reportsandpublications/rtforeports.cfm>

balancing of many complex and changing variables.

Once the impacts of the indirect effects are incorporated into this equation, as called for by the Gallagher report, the challenge of accurate reporting would be increased by several orders of magnitude.

Since the Gallagher report was issued no further progress on the inclusion of indirect CO₂ emissions has been made on later reports available on the RFA web site, thus demonstrating the difficulty of the problem.

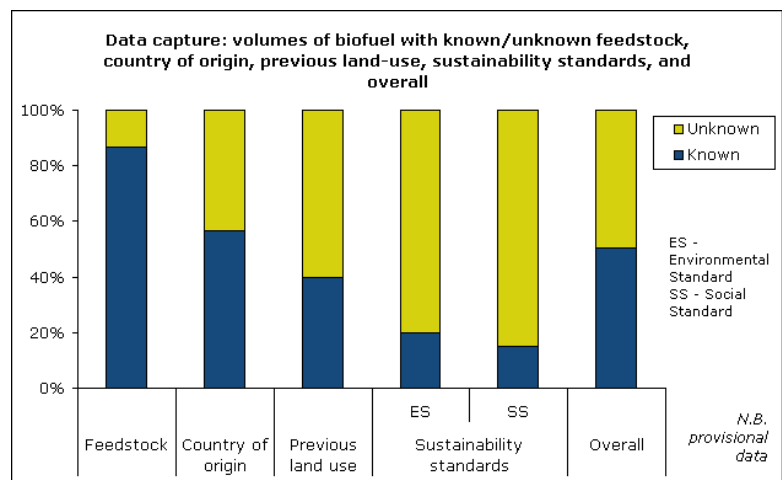


Figure 7 RFA Data Capture

The only conclusion that that can be drawn from the RFA reports is that the data quality is too poor to ensure sustainability reporting and will always remain so. This is most likely because biofuels are inherently unsustainable on the large scale basis that is demanded.

Economics and Biofuels

The evidence that biofuels are now contributing to the price increases in food is indisputable. Donald Mitchell of the World Bank has observed that the World Bank's index of food prices has increased by 120% from January 2002 to February 2008. By the calculations of the World Bank, 75% of this increase is attributable to biofuels¹⁴.

The report also dismisses the notion that high food prices are the result of speculation, with the observation that “*Export bans and speculative activities would probably not have occurred because they were largely responses to rising prices*”

The report also warns that, “*The rapid rise in food prices has been a burden on the poor in developing countries, who spend roughly half of their household incomes on food.*” When people are on subsistence wages, a small increase in the price of staple goods can change a regular slight surplus into a regular slight deficit. Over a period of time, this small change transforms life from sustainability and surplus to total poverty. This is now the experience of millions of the world's poor. Recent reports from the World Bank suggest up to 1 billion people are now going to face hunger¹⁵.

The problem now for the world's main economies is that hardships associated with food shortages and rising prices are not confined to the third world, but are faced by the developed countries within the growing poorer sections of their societies. This has profound implications for stability. The impacts of rising staple prices are visible in every developed country; the courts in the UK are becoming increasingly occupied with cases where people are unable to pay council taxes and now face jail sentences; in Australia those on low incomes are having to rely on food hand outs¹⁶, and in the United States the rise in staple prices has pushed people to foreclosure and into tent cities¹⁷. Fundamentally, for many people, the numbers simply do not add up, regardless of how hard they try. The rise in staple food prices has been one of the main driving forces behind the current surge in inflation and these price rises hit those on lower salaries far more painfully than those on higher salaries.

The people being hit the hardest are the same people that have had to mortgage to the hilt to buy property and transport. As a consequence, they have no resilience to price rise in staples and

14 <http://www->

wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2008/07/28/000020439_20080728103002/Rendered/PDF/WP4682.pdf

15 <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/AFRICAEXT/0,,contentMDK:21941591~menuPK:258659~pagePK:2865106~piPK:2865128~theSitePK:258644,00.html>

16 <http://www.3news.co.nz/Video/Australians-queue-for-free-food-handouts/tabid/313/articleID/76343/cat/251/Default.aspx>

17 <http://www.thestar.com/Columnist/article/519057>

have found themselves in the same position as those in the developing countries, such that when a small and regular surplus turns to a small and regular deficit, the end result is bankruptcy and mortgage default. The result of this is being played out today with the sub-prime crisis that has precipitated the world wide credit crunch.

This observation that a main cause of the credit crisis is attributable to biofuels is counter to the normal opinions expressed by the political leaders of all parties who suggest that the entire problem was the result of lax legislation or greedy bankers and can ultimately be solved by improved oversight and cash injections. Discussion of the more profound causes is generally avoided as it goes to the heart of our economic system.

However, fundamental problems can not be avoided. We now live in a world that has were the economy has grown exponentially and continuously since the start of the industrial revolution, as a result it is becoming more and more strained as it approaches limits of growth. These limits of growth are an inevitability and maintaining growth in the face of them becomes increasingly impossible to achieve¹⁸.

It is no coincidence that todays credit crunch is occurring at the same time as environmental collapse and over population, as it is fundamentally the environment that drives the economy. No society that has ever neglected its environment has survived.¹⁹

This inability to maintain growth becomes critical when the economy depends on continuous growth to survive. The result is that we face a major discontinuity. In the same way that the lift on an aircraft's wing increases linearly as the angle of attack increases, but collapses totally and instantaneously when the angle of attack exceeds the stall angle at which point the air is unable to remain attached to the wing's upper surface, see Figure 8, then so it is with the economy. As economic growth expands it places more demands on the environment, eventually once a critical point of stress is reached and growth permanently stops then a total economic collapse will ensue.

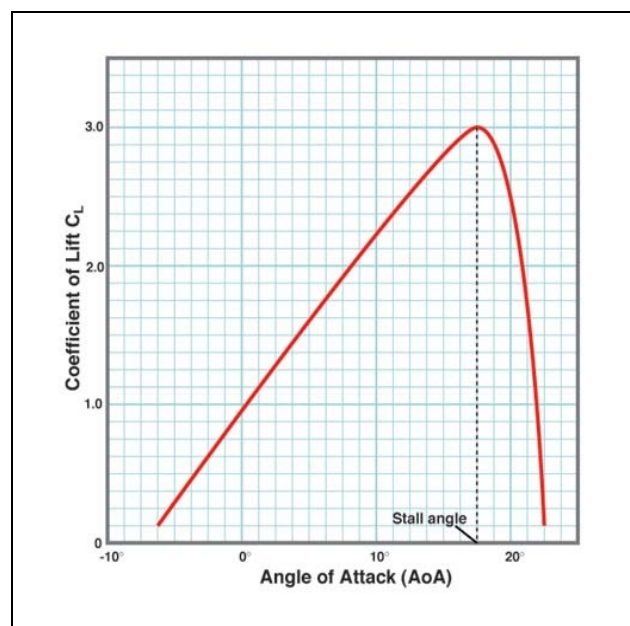


Figure 8 Non-linear response

The highly stressed state of our economy and environment is the fundamental problem facing us all.

18 Impossibility, the Science of Limits and the Limits of Science, Barrow, ISBN 0198518900

19 Jared Diamond, Collapse - How Societies Choose to Fail or Succeed, ISBN 978-0670033379

Any unnecessary stress will most likely have a non-linear response, potentially causing a massive destabilisation. The distortion of the staple food prices caused by the biofuel industry is a major cause of unnecessary stress on an already stressed system. In the context of expected non-linear responses to our economy it is extremely dangerous and we must manage a rapid retreat from this economic and environmental stall point.

Biofuels and Human Rights

Biofuel production is now inextricably linked to human rights abuses on a scale not seen since the atrocities of the Second World War.

The abuses come in two forms. The first form is the starvation that many people are being pushed into worldwide. The second form is the forcible land clearances where peoples' land and livelihoods are being stolen and many are murdered in the process. This is happening in all the main biofuel producing regions of the world. Many of the main Non Government Organisations such as Friends of the Earth²⁰ and Oxfam²¹ have now reported on these abuses.

Biofuel Watch has 29 separate declarations from organisations in the south, where each declaration represents up to 30 organisations, calling for an end to biofuel as they see their livelihoods being endangered.²² This represents the wishes of many hundreds of thousands of people who do not ordinarily have a voice in this matter.

The rate at which these abuses are occurring is accelerating and is highly correlated with the price of the biofuel feedstocks and the subsequent deforestation. Given the increasing market demand for biofuel, the pressure for deforestation is increasing. Figure 9 shows a NASA earth satellite photograph of the Amazon taken in September 2007 following the largest forest clearances to this date through burning.

As a consequence of these land grabs from the indigenous peoples of the world, much of the biofuel being sold today are stolen goods. This needs to be accepted as the default legal position due to the total lack of evidence of sustainability as highlighted from the RFA and Gallagher reports. Therefore the onus is not for those opposing biofuels to prove that the the products being sold are stolen, but it is for the vendors to prove that their products are not stolen.

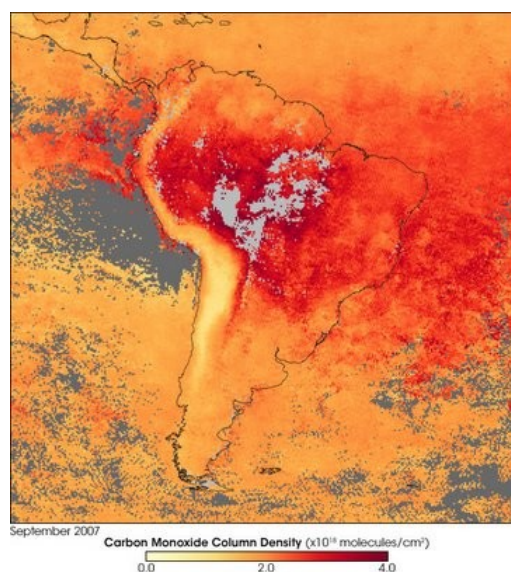


Figure 9 NASA image of Amazon fires

²⁰ <http://www.foe.co.uk/resource/reports/losingground-summary.pdf>

²¹ http://www.oxfam.org.uk/resources/policy/climate_change/downloads/bp114_inconvenient_truth.pdf

²² <http://www.biofuelwatch.org.uk/declarations.php>

Second and Third Generation Solutions

The biofuel industry has claimed that the many of the problems currently associated with the first generation fuels can be resolved by moving to second and third generation fuels.

However, this assumes that the laws of unintended consequence do not prevail. There is little evidence to suggest that this will not be case.

Jatrophia is recognised as being a second generation biofuel. It was hailed as being a wonder plant that would not compete with the food crops and is now being grown around the world to provide biofuel feedstock. However, the past record of introducing new species into existing environments has been proven to be disastrous in almost every occasion and the list of problems is almost endless from Japanese knot weed in UK, invasive weeds in Montana²³, rabbits in Australia²⁴ and snails in Hawaii²⁵. We stand to recreate these risks on an unprecedented scale by the wide spread introduction into other ecosystems of Jatropha, especially when it has already been classified as a dangerous weed²⁶. These risks are being introduced to the environment for a plant that does not even produce reliable crops and yields^{27 28}.

In India, virus infections are now becoming a problem in Jatropha crops²⁹. While this may help prevent the spread of the weed, it does further undermine credibility of Jatropha as a wonder crop.

Third generations fuels such as algae would appear to offer more hope than existing first or second generation fuels. However these are not without inherent problems. Much of the technology is based around genetically modifying algae to allow easier extraction of fuel. This essentially amounts to changing the genetic pool at the base of the food chain and poses uncontrollable risks on an unimaginable scale.

23 <http://www.weedawareness.org/impacts.html>

24 http://en.wikipedia.org/wiki/Rabbits_in_Australia

25 <http://www.hawaii-forest.com/natural-history/essays/1998-08.asp>

26 http://www.hear.org/pier/wra/pacific/jatropha_curcas_htmlwra.htm

27 http://business.timesonline.co.uk/tol/business/industry_sectors/natural_resources/article4004107.ece

28 <http://uk.reuters.com/article/oilRpt/idUKHKG7593720070912>

29 <http://www.iisc.ernet.in/currsci/sep102006/584.pdf>

Options for Tesco

Tesco is in a unique position to define the debate on biofuels. It was initially in a leading position in the UK in terms of biofuel sales, and is again taking a leadership position by having declared on its web site that the science is no longer clear and publicly committing to reviewing its strategy³⁰. Furthermore, unlike other companies selling petrol and diesel, Tesco is in the position to see the emerging conflicts between food and fuel.

If Tesco move to the next logical stage and support the abolition of the RTFO, it would undermine whole concept behind the legislation and potentially be one of the most significant environmental acts that any major company has taken in this country in recent years.

During protests against biofuels outside Tesco stores, it is evident that the majority of customers who have been spoken to are aware of the problems associated with biofuels and are highly cynical about the claims of it being environmentally friendly. The longer Tesco continues to sell biofuels, the higher the reputation risk becomes.

The immediate actions that are required of Tesco in priority order, (based on minimising cost and maximising immediate effect), are:-

1. Support NGO calls to scrap the RTFO legislation and to use Tesco's influence to lobby decision makers.
2. Sell biofuel free fuel. This will be in breach of the Renewable Transport Fuel Obligation, but as the "*The RTFO aims to encourage the supply of biofuels from sustainable sources that will contribute effectively to the reduction of greenhouse gas emissions,*"³¹ Tesco would be able to demonstrate in any court that large scale biofuels production is inherently unsustainable and will never contribute to a reduction in greenhouse gas emissions.
3. Divest from Greenergy
4. Support calls for investment to restore forest areas damaged in recent years by the rush to biofuels.
5. Invest in solutions that have genuine environmental benefits and future market potential such as electric cars³².

30 <http://www.climatechangecorp.com/content.asp?ContentID=5648>

31 <http://www.dft.gov.uk/pgr/roads/environment/rtfo/aboutcarbonsustainability>

32 <http://www.hubbartpeak.com/Patzek/CanWeOutliveOurWayOfLife20070809.pdf>