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Biofuels and sustainability: an investor perspective

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In this report...

- How the biofuels industry has been hit by sustainability concerns
- What the industry is doing to respond
- Four recommendations for companies and governments

F&C Investments

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Summary

- Despite widespread enthusiasm and opportunities for biofuels, the industry faces an uncertain future with high political risks.
- Biofuels producers, oil and gas majors and public policy makers have paid insufficient attention to public concern about carbon savings, food security and biodiversity.
- The biofuels industry has a role to play in combating climate change, but it needs to take a pro-active approach to tackling social and environmental challenges.
- This will involve companies engaging in the public debate actively, governments setting clear political and regulatory frameworks, and the development of global industry-wide standards for more sustainable operations.

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1. Background: the biofuels bubble bursts

Background

In 2006, the capital markets witnessed a series of initial public offerings (IPOs) of biofuel companies. Promising high returns, energy independence and a way to reduce greenhouse gas emissions from transport, the fledgling biofuels industry shot to prominence. One year later, chastened by a series of profit warnings, the biofuels industry has been stunned by an aggressive political backlash, led by environmental campaigners, that has steadily snowballed into a chorus of concerns voiced by United Nations' food and agriculture officials and the Organisation for Economic Cooperation and Development (OECD).

What is a biofuel?

Biofuels are transport fuels made from agricultural products or waste. They have two key advantages over fossil fuels: the potential to cut greenhouse gas emissions; and second, frequent domestic production that can benefit security of supply. The main "first-generation" biofuels in commercial use are ethanol, a grain-based alcohol, and biodiesel, which are produced from oil crops or animal fat. The US and Brazil favour ethanol, while in Europe and Malaysia, biodiesel based on vegetable oil is more popular. "Second-generation" biofuels use more advanced production techniques, but are only in early-stage development. Cellulosic ethanol, for instance, uses specialist enzymes in the production process, and is widely recognised as a more sustainable biofuel as it can use a wider range of feedstocks and is likely to have a better greenhouse gas balance.

How big could the biofuels industry become?

The International Energy Agency estimates that biofuels could contribute up to 30% of road transportation fuels by 2050. The European Union's current regulatory objective is for biofuels to comprise 10% of EU fuel by 2020. The US Renewable Fuels Standard aims for 7.5 billion gallons of renewable fuel in the US market by 2012, compared with current US motor fuel consumption of over 180 billion gallons. At press time there were proposals for the new US Energy Bill to mandate a further increase to 36 billion gallons by 2022.

What are the concerns about biofuels?

Biofuels crops have started to compete for land with food crops, which raises food prices and affects food security and rural livelihoods. First-generation biofuel crops typically require new plantations, which have prompted allegations of corruption, illegal expropriation of land and mistreatment of small farmers and indigenous peoples. Meanwhile, concerns have multiplied that the actual emissions saved by biofuels are lower than claimed. Producing ethanol releases emissions – for example, in producing fertilisers and harvesting crops – while growing crops such as palm oil for biodiesel may involve clearing forests and peat bogs, which destroys valuable carbon sinks.

What is the long-term future for the industry?

The biofuels industry initially promised a solution to climate change, incentivised by stretching government targets – so why did the tables turn on this "miracle" fuel and what is its future?

F&C's view, based on analysis of 30 companies[1] is that the industry's future is highly uncertain because of political risks. When coming to the markets for finance the "new economy" biofuels producers: bet on continued low commodity prices; misjudged government sensitivity to food price inflation and environmental concerns; and failed to find industry solutions to sustainability challenges, such as deforestation associated with sourcing palm oil. Despite early stumbles, the biofuels industry may still be viable and stands to benefit from new opportunities, if it takes a more pro-active and forward-looking approach to tackling some of the challenges and criticisms it faces. The "old school" oil and gas industry, with its history of high levels of public scrutiny, has more experience negotiating sustainability issues, and may play a pivotal role in building standards for good practice.

They said...

"The rush to energy crops threatens to cause food shortages and damage to biodiversity with limited benefits"

OECD Roundtable on Sustainable Development, "Biofuels: is the cure worse than the disease?", September 2007

They said...

"The development of new bioenergy industries could provide clean energy services to millions of people who currently lack them, while generating income and creating jobs in poorer areas of the world. But the rapid growth… could have negative economic and social effects, particularly on the poor who spend a large share of their income on food"

United Nations, Sustainable Bioenergy, A Framework for Decision-makers, 2007

1 **European companies:** Argent Energy, BP, D1 Oils, Eni, Ensus, Marks & Spencer, Neste Oil, Petrotec, Royal Dutch Shell, StatoilHydro, Tesco, Total, and Verbio AG. **Emerging markets companies**: Brasil Ecodiesel, China Sun Bio-Chem Technology, Clean Energy Brazil, CNOOC and Petrobras. **US companies**: Archer Daniels Midland, Aventine Renewable Energy, Bunge Ltd, Chevron, DuPont, Global Ethanol, Marathon Oil, Metabolix, Pacific Ethanol, Potash Corporation, Tesoro and Verasun Energy.

2. How is the biofuels industry addressing sustainability challenges?

F&C has engaged in depth with key actors in order to catalyse a more sustainable biofuels industry that will be attractive to long-term investors. This has included engagement on carbon savings, labour standards and biodiversity with

- New biofuels producers with public listings
- Traditional oil and gas majors with biofuels projects
- The Roundtable on Sustainable Biofuels, a new industry body
- Public policy makers that formulate incentives for biofuels

Speciality biofuels companies

F&C conducted in-depth research of eleven specialist, first-generation biofuels producers with recent IPOs to assess their approach to biofuels sustainability. We found:

- **Limited public disclosure of carbon savings:** few companies publish life-cycle assessments of their products' greenhouse gas emissions, raising questions about the actual carbon savings biofuels offer. F&C welcomes the UK government's recent decision, in line with F&C's recommendations, to develop mandatory public reporting standards for biofuels, overseen by a new government body, the Renewable Fuels Agency.
- **Poor supply chain oversight:** biofuels producers have low awareness about supply chain biodiversity and labour practices; this is concerning given that their supply chains are agricultural and, as such, high-risk.
- **Reluctance to develop global industry standards for sustainability:** at the time of research, no companies were involved in industry initiatives.
- **Low investment in second-generation biofuels:** raises concerns about how investment in innovative technologies will be funded.

Sustainability practices of biofuels producers[2]

Company name	Managing greenhouse gas emissions?[3]	Sustainability management in sourcing feedstock?[4]	Managing labour practices?[5]	Public disclosure[6]	Working with industry peers on sustainability challenges?[7]	Researching 2nd generation biofuels?
Argent Energy	✔		✔	✔		
Aventine Renewable Energy						
Brasil Ecodiesel		✔	✔	✔		
China Sun Bio-Chem Technology	✔					
Clean Energy Brazil		✔	✔			
D1 Oils	✔	✔	✔	✔		
Ensus	✔					
Global Ethanol	✔					
Pacific Ethanol	✔					
Petrotec	✔			✔		
Verbio AG	✔	✔		✔		

2 Information available as at the time of the Initial Public Offering
3 F&C assessed a company as "managing greenhouse gas emissions" if it had either conducted or planned to conduct a life-cycle assessment, or was actively reducing emissions through clear management systems.
4 This question was only relevant to companies involved in biodiesel
5 F&C asked whether labour standards are managed in both the direct workforce and supply chain workers
6 F&C considered public disclosure to be evident in a website section covering sustainability practices, such as greenhouse gas emissions and sourcing practices
7 For example, evident in membership of the Roundtable on Sustainable Palm Oil

Oil and gas majors

F&C identified the oil and gas sector as a key player in shaping the biofuels industry. Oil and gas companies may produce biofuels, or government targets may compel them to blend biofuels at their refineries or distribute them at petrol pumps. F&C has had detailed discussions with a number of oil and gas companies, including **BP**, **Chevron**, **Eni**, **ExxonMobil**, **Petrobras**, **Shell** and **StatoilHydro**. Our conclusion is that the oil and gas industry needs to take a strategic approach towards biofuels, actively engaging in public debates about them and developing industry-wide sustainability principles for biofuels. Our engagement has found:

- **A wide variation in biofuels strategies:** with some companies already involved in first-generation production, and others holding back until more advanced technologies are available. **Total**, for instance, is involved in production, while **ExxonMobil** has expressed scepticism about the achievability of US biofuels goals and is instead funding scientific research into second and third generation biofuels "breakthrough technologies." **BP** and **Shell** are focusing their investments in biofuels that reduce emissions and have minimal negative impacts. **BP** for instance has invested $160 milllion in a joint venture to cultivate jatropha, a non-edible oil-bearing crop that can grow on marginal land, (ie not displacing food crops or natural forests), and that requires less irrigation than standard crops.
- **Considerable support for second-generation biofuels:** while the involvement of the oil majors in first-generation fuels is, in general, relatively limited, all have research programmes into second-generation alternatives, some of which represent very substantial investments. **Shell**, for instance, recently announced plans to build a commercial plant producing biodiesel from algae within the next two years.
- **A mixed picture on supply chain sustainability practices:** few companies are implementing robust policies and monitoring systems for biofuels, despite the fact that all are major distributors of biofuels even if they are not producers. One exception is **Shell**, which has a detailed, specific policy for sustainable sourcing of feedstock and a dedicated biofuels sustainability compliance officer.
- **Limited public disclosure:** Companies presently have weak disclosure about their long-term biofuels strategies, net carbon savings and feedstock sourcing policies. Given that biofuels are proposed as a climate change solution, it is concerning that few companies have published a life-cycle assessment of biofuels' greenhouse emissions. More positively, a few companies including **BP** provided F&C with greater details of their strategy, and have vocally supported the UK government's Biofuels Assurance Scheme, which will enable the assessment and monitoring of life-cycle greenhouse gas emissions.
- **Patchy support for industry-wide sustainability standards: Shell**, **BP** and **Petrobras** are working together to address sustainability challenges and are participating in the new Roundtable for Sustainable Biofuels. Some other companies are working with national governments or with other initiatives, but there is not yet industry-wide co-operation.

Sustainability practice of oil and gas companies involved in biofuels

Company name	Involved in production of 1st generation Biofuels?	Sustainability standards in place?*	Participating in Roundtable on Sustainable Biofuels?	Researching 2nd generation Biofuels?
BP	✔	Specific	✔	✔
Chevron	✔	Information unavailable		✔
Eni		General		✔
ExxonMobil		General		✔
Petrobras	✔	Information unavailable	✔	✔
Shell		Specific	✔	✔
StatoilHydro	✔	Specific		✔
Total	✔	General		✔

*Specific: Company has sustainability policies specific to biofuels. General: Biofuels sourcing adheres to general company sustainability standards.

Industry bodies

Competitive drivers can deter companies from acting sustainably. To create change, companies need to act individually and engage with industry players to set sector-wide standards. F&C has encouraged the industry to form a new Roundtable on Sustainable Biofuels, building on the experience of the Roundtable on Sustainable Palm Oil. This would have the aim of promoting certified, sustainably sourced biofuels. F&C has contributed to the evolving membership standards, and has recommended that these should include:

- Definitions of ecosystems, based on the Convention on Biological Diversity
- Standards for labour practices, based on the ILO Core Conventions
- Required public reporting by companies on sustainability practices.

Public policy makers

For companies to invest in climate change solutions, they need a regulatory environment that rewards them for sustainable behaviour, and penalises unsustainable practices. F&C engages with public policy makers and companies to promote targets, incentives and subsidies to allow companies to develop profitable businesses that deliver long-term environmental benefit. F&C has called on UK, EU and US biofuels policy to:

- Link the greenhouse gas savings that biofuels generate with the level of subsidy provided, so that targets do not solely focus on volumes of biofuels produced.
- Set minimum standards for emissions reduction, biodiversity in feedstock supply, and labour standards in agricultural supply chains;
- Require companies to report publicly on their sustainability practices;
- Remove protectionist barriers to international trade in biofuels.

F&C has also encouraged companies within the industry to engage with policymakers to shape future regulation on sustainability standards.

3. Next steps

After extensive discussions with key players in the industry and with outside experts, F&C's assessment is that although government targets will drive demand for cleaner transport fuels, the global biofuels industry faces high political risks and its future is uncertain. Few US, European or emerging markets companies demonstrate a strong strategy for the scale of the challenge of creating a sustainable biofuels industry.

F&C believes that in spite of these obstacles, it is possible to create a sustainable biofuels industry. However, to rebuild public confidence and to deliver sustainable investment returns, the biofuels industry must take action in 2008. F&C will encourage companies and government to take these four key actions:

1. **Governments need to set a clearer political and regulatory framework for a sustainable and competitive biofuels industry**, and remove European and US trade barriers such as tariffs on Brazilian ethanol imports. Governments need to promote investment in new technology, as this will be key to the industry's success. Biofuels policies must enhance climate change prevention strategies and subsidies should be linked to achieving real carbon savings.
2. **The biofuels industry needs to work more closely with governments** to promote political objectives on carbon savings, technology, food prices, food security and international development. The industry also needs to encourage governments to support easier distribution of biofuels.
3. **Global industry-wide standards must be implemented** to ensure biofuels have a net positive impact on ecosystems. This needs to happen fast, as biofuels producers face a profit margin squeeze due to rising commodity prices, and many are sourcing low-cost feedstocks, regardless of the long term environmental damage they cause.
4. **The industry must engage more actively in public debate** about biofuels and demonstrate transparency on carbon savings and sourcing impacts.

The biofuels industry stands at a crossroads and must collectively address public concerns. If companies do not convince the public that they will move towards sustainable business models, they may find that governments change course on the targets and subsidies that are driving their industry's growth.

We said...

"The biofuels industry presents long-term opportunities, but currently the economics are unfavourable, with excess capacity and rising input prices. Until this changes, and until there is also greater clarity on regulatory policies, we will be very wary about any investments in the sector."

Terry Coles, Co-Manager, F&C Global Climate Opportunities Fund

Contact us

+44 (0) 20 7628 8000

+44 (0) 20 7011 5487

www.fandc.com

For further information on this report please contact:

Vicki Bakhshi
Associate Director, Governance
& Sustainable Investment
vicki.bakhshi@fandc.com
Tel: +44 (0) 20 7011 4473

Sagarika Chatterjee
Associate Director, Governance
& Sustainable Investment
sagarika.chatterjee@fandc.com
Tel: +44 (0) 20 7011 4538

UK
Enrico Ponzone
enrico.ponzone@fandc.com

Ireland
Graham Brooks
graham.brooks@fandc.com

Switzerland
Christian Zeitler
christian.zeitler@fandc.com

France
Bruno Moneron
bruno.moneron@fandc.com

Netherlands
Anja Meijer
anja.meijer@fandc.com

USA
William Boardman
william.boardman@fandc.com

Germany
Claus-Dieter Heidrich
claus.heidrich@fandc.com

Portugal
Joao Santos
joao.santos@fandc.com

Nordic region
Erik Orving
erik.orving@fandc.com

Private Investors: **+44 (0) 8000 085 2752**

F&C Management Limited
Exchange House, Primrose Street, London EC2A 2NY, United Kingdom.

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