6 BIOFUELS MARKET

Liquid biofuels have been in use ever since Rudolf Diesel ran his engine on peanut oil at the World's Fair in Paris in 1900. Due to concerns related to greenhouse gas emissions from fossil fuels, worries over national energy security and various socioeconomic concerns, biofuels regained popularity toward the end of the twentieth century. Bioethanol and biodiesel gained prominence during the 1970 oil crisis as an alternative to fossil fuels for use in transportation in Brazil. For the rest of the world, however, biofuels are a phenomenon of the last 10 to 12 years, as the European Union, the United States and many other markets started subsidizing biofuels partly in a quest to compensate farmers for the phasing out of conventional agricultural subsidies under World Trade Organization pressure and partly to help reduce greenhouse gas emissions.

Many governments around the world have now implemented ambitious targets and policies to promote biofuels. For example, the European Union has endorsed a mandatory target of a 20 per cent share of all energy from renewable sources in overall energy consumption by 2020 and a mandatory 10 per cent target (a recent plenary vote in the European Parliament yielded an agreement to cap the contribution of first-generation biofuels at 6 per cent, as discussed later in this report) to be achieved by all member states for the share of biofuels in the transport sector by 2020. As a result, the world production of ethanol and biofuels doubled between 2005 and 2012.

The global aggregate production of bioethanol and biodiesel averaged 124,141 million litres per year from 2010 to 2012 (Organisation for Economic Co-operation and Development (OECD) & Food and Agriculture Organization of the United Nations (FAO), 2013). Sugar and cereal crops such as maize, sugar cane, sugar beet, cassava, wheat and sorghum are important feedstocks for ethanol production, while oilseed crops such as rapeseed (canola), soy, palm oil and jatropha are important for biodiesel. Due to the wide variety of feedstocks that may be made into biofuels, many countries around the world can participate in the biofuels market. However, despite the initial enthusiasm related to the promises of an alternative source of energy that could replace fossil fuels, significant problems with producing biofuels at a large scale have begun to emerge as the industry develops. Many observers have claimed that biofuels may not reduce greenhouse gas emissions as much as originally anticipated and that they may compete with food production and, subsequently, affect food security and food prices (EurActiv.com, 2012; Fonseca et al., 2010; Hamelinck, 2013; Laborde, 2011). Important environmental consequences of

TABLE 6.1 STANDARD-COMPLIANT AND CONVENTIONAL KEY STATISTICS FOR BIOFUEL PRODUCTION AND TRADE, 2010–2012.

KEY STATISTICS

Top 5 producers of ethanol and biodiesel (87% of total) (2010–2012)	United States (42%), Brazil (23%), European Union (14%), China (7%), India (2%)
Top 5 consumers (88% of global) (2010–2012)	United States (40%), Brazil (21%), European Union (18%), China (7%), India (2%)
Major international voluntary sustainability standards	Bonsucro, ISCC, RSB, RSPO, RTRS
Global production of ethanol and biodiesel (2010–2012)	124,141 million litres
Standard-compliant production (2012)	ISCC: 2,266 certified operations; RSB: 7 certified operations, RSPO: 8,180,000 metric tons of palm oil; RTRS: 960,000 metric tons of soybeans; Bonsucro: 2.2 million litres of ethanol
Key sustainability issues	Food security, climate change, maintaining biodiversity

Sources: Top 5 producers, top 5 consumers, global production: OECD & FAO, 2013; standard-compliant production: Bonsucro, 2013d; Freire, 2013; ISCC, 2013; RSB, 2011; S. Yaacob, RSPO, personal communication, April 15, 2013.

biofuels expansion also include the loss of biodiversity, land use change impacts, and the depletion of rainforest and scarce water resources. Some of these issues can be addressed by promoting the use of feedstocks compliant with voluntary sustainability initiatives in biofuel production.

The main voluntary standards covering biofuels for specific crops are the Roundtable on Sustainable Palm Oil (RSPO), the Round Table on Responsible Soy (RTRS) and Bonsucro. The Roundtable on Sustainable Biomaterials (RSB, formerly the Roundtable on Sustainable Biofuels), along with the International Sustainability and Carbon Certification (ISCC), address various feedstocks for the sustainable production of biomass and biofuels. Both are in relatively early stages of development; ISCC just recently became an independent organization of the German Federal Ministry of Food, Agriculture and Consumer Protection via the Agency for Renewable Resources in 2012, while the RSB launched its global certification system in 2011 and has since then issued seven certificates. ISCC, by contrast, has issued over 4,000 certificates, with over 2,000 active by December 2013.

6.1 MARKET REVIEW

Market reach
The European Union is currently the only market that promotes the use of voluntary sustainability standards like ISCC, RSB, RSPO, RTRS and Bonsucro for the sustainability assessment of feedstocks.

Growth
Biodiesel and bioethanol production and consumption are expected to grow about 60 to 70 per cent by 2022.

Regional importance
The United States, the European Union and Brazil consume about three-fourths of the world's biodiesel and bioethanol.

Pricing and premiums
Premiums for standard-compliant palm oil and soy ranged from 0.3 to 6 per cent over the past several years.

6.2 MARKET DEVELOPMENT

Concerns over the negative effects of biofuel production intensified in the food crisis of 2007 and 2008 when the cost of food imports increased dramatically, rising 29 per cent above the record prices attained the previous year. This was due to the rising prices of imported cereals and vegetable oil, two commodity groups that are important inputs in biofuel production. Because these feed ingredients were more expensive, the price of meat and dairy products also shot up and freight rates increased, affecting the price of all imported commodities and putting pressure on the ability of countries to cover their import bills. When high food prices are coupled with high fuel prices, the economic prosperity and food security of low-income countries is threatened, as many countries are highly dependent on imports of petroleum products and major cereals for domestic consumption (FAO, 2008).

Similar controversies have emerged concerning the impacts of biofuel policies on greenhouse gas emissions, compared to fossil fuels. A recently leaked document from the European Commission shows that the carbon footprint of biodiesels made from palm oil, soybeans and rapeseed is only marginally smaller than that of oil made from tar sands (Carrington, 2012). According to this document, these biofuels present a higher volume of greenhouse gas emissions than crude oil (EurActiv.com, 2012). Concerns over indirect land use change, food security and greenhouse gas emissions related to the expansion of crops such as palm oil, soybeans, corn and sugar cane for biofuels have also received considerable attention from organizations like WWF (2013b), Greenpeace ("Greenpeace: EU's biofuels plan," 2012) and ActionAid (n.d.).

In response to these concerns, a European Commission proposal published in late 2012 sought to limit land conversion for biofuel production and improve the climate benefits of biofuels used in the European Union (European Commission, 2012d). The proposal aims to reduce indirect land use change by limiting the amount of first-generation biofuels that can be counted toward the renewable energy target, by revising this target from 10 per cent to 5 per cent. The European Union has recently taken concrete steps toward this goal, beginning with a plenary vote in September 2013 for a cap on first-generation biofuels in its Renewable Energy Directive, or EU-RED (for the Directive, see European Parliament and Council, 2009). The vote resulted in a narrowly decided agreement to limit the contribution of first-generation biofuels, reducing the target of transport fuel via renewable sources from 10 per cent to 6 per cent.

In addressing sustainability concerns, the European Commission currently also requires that, in order to receive government support or count toward the mandatory national renewable energy targets, biofuels used in the European Union need to comply with sustainability criteria, which aim to prevent the loss of biodiversity and high carbon emissions from the production of raw materials for biofuels. To this end, the European Commission requires that the sustainability of biofuels be checked by member states or through voluntary sustainability standards. The EU-RED has recognized 14 voluntary sustainability standards (see Box 6.1) since July 19, 2011, which apply directly to EU-27 member states. These standards include ISCC-EU, Bonsucro EU, the RTRS EU-RED, the RSB EU-RED and the RSPO-RED, all of which are covered in this review. These schemes are being recognized on the basis that they comply with the sustainability criteria under Directives 2009/28/EC and 2009/30/EC of the European Parliament and the Council (European Commission, 2013a).

Two main factors can be expected to drive voluntary sustainability standard (ISCC, RSB, RSPO, RTRS and Bonsucro) certified feedstock volumes in the future. The first is the demand for biofuels driven by policy initiatives that promote the use of fuels from renewable sources for transportation. The other is the importance that is placed on ensuring that the feedstock being used to produce this biofuel is sustainable in terms of the social, environmental and economic effects stemming from its production. The European Union, the United States and Brazil are the three largest biofuel-consuming countries and are expected to represent 83 per cent of total bioethanol and 74 per cent of total biodiesel consumed by 2022 (OECD & FAO, 2013). Therefore, policy drivers in these countries are particularly important.

The expanded Renewable Fuel Standard (RFS2) in the United States, along with EU-RED, is expected to contribute to the continued expansion of biofuels globally, with world production reaching 168 billion litres of bioethanol and 41 billion litres of biodiesel by 2022. Based on these predictions, the global production of bioethanol and biodiesel will increase 70 per cent by 2022, compared to the average from 2010 to 2012, and 12 per cent of coarse grains, 29

BOX 6.1 RECOGNIZED VOLUNTARY SCHEMES UNDER EU-RED

Since July 19, 2011 the European Commission has recognized voluntary schemes that apply directly in 27 EU member states. Schemes include:

- **ISCC-EU** (International Sustainability and Carbon Certification): Multi-feedstock
- **Bonsucro EU**: Sugar cane
- **RTRS EU-RED** (Round Table on Responsible Soy EU-RED): Soy
- **RSB EU-RED** (Roundtable on Sustainable Biofuels EU-RED): Multi-feedstock
- **2BSvs** (Biomass Biofuels voluntary scheme): Multi-feedstock
- **RBSA** (Abengoa RED Bioenergy Sustainability Assurance): Multi-feedstock
- **Greenergy** (Greenergy Brazilian Bioethanol verification program): Sugar cane
- **Ensus** voluntary scheme under RED for Ensus bioethanol production: Wheat
- **Red Tractor** (Red Tractor Farm Assurance Combinable Crops & Sugar Beet Scheme): Multi-feedstock
- **SQC** (Scottish Quality Farm Assured Combinable Crops scheme): Winter wheat, maize, oilseed rape
- **Red Cert**: Multi-feedstock
- **NTA 8080**: Multi-feedstock
- **RSPO-RED** (Roundtable on Sustainable Palm Oil RED): Palm oil
- **Biograce greenhouse gas calculation tool**: Multi-feedstock

Sources: European Commission, 2013a; also see GOV.UK (n.d.).

per cent of sugar cane and 15 per cent of vegetable oil produced annually by 2022 will be required as feedstock for biofuel production (OECD & FAO, 2013); however, the European Union is currently the only jurisdiction requiring the consideration of compliance with recognized voluntary standards to ensure the sustainability of biofuel feedstocks.

Taking the conservative assumption that the European Union caps the contribution of first-generation biofuels at 5 per cent, the European market would still increase its consumption of ethanol by about 70 to 75 per cent between 2012 and 2022, while biodiesel consumption would increase about 45 per cent (OECD & FAO, 2013). Assuming that biofuel feedstocks maintain the same share of total feedstock use for biofuel production as they did in 2010 (van de Staaij, van den Bos, Toop, Alberici, & Yildiz, 2012; see Table 6.1 and Table 6.3), by 2022 about 3 million metric tons of soybeans, 1.3 million metric tons of palm oil and 500,000 metric tons of cane sugar would be needed to supply the European Union's biofuel consumption needs. In comparison, RTRS soybean volumes measured 960,000 metric tons in 2012, while RSPO palm oil measured 8.18 million metric tons and Bonsucro cane sugar measured 2.96 million metric tons. A number of studies commissioned by the European Commission suggest that some crops, such as palm oil, soybeans and rapeseed, could be even more environmentally polluting than crude oil in terms of greenhouse gas emissions after accounting for indirect land use change. Such studies could lead to significant shifts away from these feedstocks toward other less polluting crops like sugar beet and sugar cane (Carrington, 2012; EurActiv.com, 2012).

An additional factor that will affect the production and consumption of biofuels is the progress in developing advanced second- and third- generation biofuels produced from lignocellulosic biomass, waste material and other non-food feedstock. Most projections, however, forecast a limited production of second-generation biofuels. Companies like DuPont and BP Global (BP, formerly known as British Petroleum) are currently developing these types of biofuels. BP uses the ISCC scheme for its British wheat ethanol joint venture, Vivergo; the company also claims to play an active role in the promotion of developing sustainability standards across the industry (BP Alternative Energy, 2013).[1] DuPont is currently investing in a biofuel production plant that can produce up to 27.5 million gallons of bioethanol from corn stover feedstock (DuPont, 2012).

1 A senior executive of BP, James Primrose, as of 2013 is also the chairman of Bonsucro (Bonsucro, 2013c).

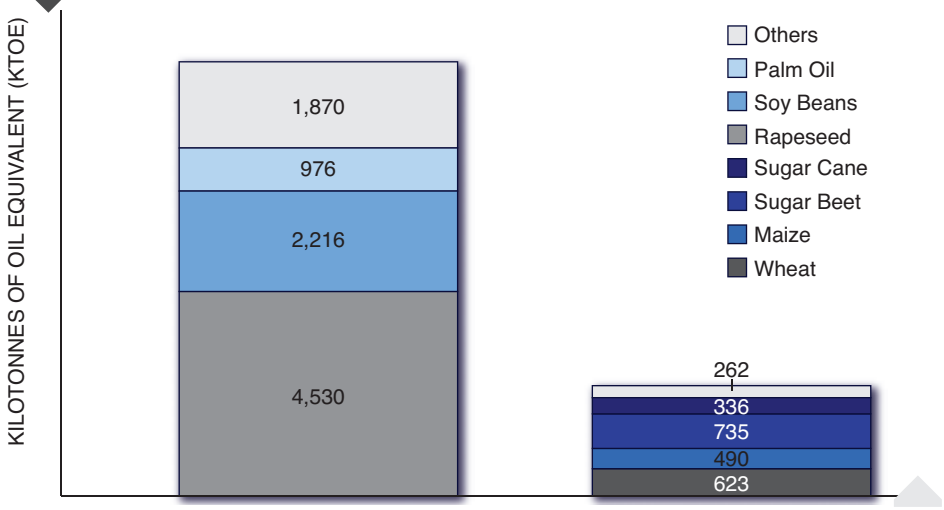
6.3 MARKET PERFORMANCE

The seven key biofuel crops in the European Union are rapeseed, soybeans, palm oil, wheat, maize, sugar beet and sugar cane. The most important feedstock for biodiesel is rapeseed originating from the European Union, followed by soy from Argentina, palm oil from Indonesia and Malaysia, and rapeseed from Canada and Ukraine (see Figure 6.1 and Table 6.2) (van de Staaij et al., 2012). For EU-produced bioethanol, most of the wheat, maize and sugar beet feedstocks originate from the European Union, while sugar cane mostly originates from Brazil (see Figure 6.1 and Table 6.3) and maize is imported from the United States (van de Staaij et al., 2012). In the European Union, biodiesel accounts for approximately 70 per cent of all renewable energy used for transportation; the rest is largely composed of bioethanol, with about 5 per cent considered "other liquid biofuels."

Biodiesel consumption in the European Union increased 78.5 per cent between 2007 and 2012 to reach 13.8 million litres in 2012, while bioethanol increased 146 per cent during the same time period to reach 5.8 million litres (Flach, Bendz & Lieberz, 2012). The European Union is the largest producer and user of biodiesel and is expected to produce 45 per cent, and consume 51 per cent, of total world biodiesel production volumes by 2022 (OECD & FAO, 2013). According to Oil World data, the EU biofuels industry has increased its use of palm oil as biodiesel feedstock by 365 per cent from 2006 to 2012, from 0.4 million metric tons to 1.9 million metric tons per year (Gerasimchuk & Koh, 2012). In contrast, the European Union is expected to produce only 7 per cent, and consume 10 per cent, of total world production of bioethanol by 2022, while the United States is expected to account for about 50 per cent of global production and consumption and Brazil is expected to account for about 25 per cent of bioethanol production and consumption.

The voluntary sustainability standards reviewed in this section are ISCC, RSB, RSPO, RTRS and Bonsucro. ISCC and RSB can, in theory, certify all biofuel crops, while the other voluntary sustainability standards specialize in a single crop, as follows: RSPO certifies sustainable palm oil, RTRS certifies sustainable soy, and Bonsucro certifies sustainable sugar cane. In 2010, palm oil feedstock accounted for 976,000 metric tons, or 10 per cent, of the total consumption volume of biodiesel in the European Union, while soybeans accounted for 2.3 million metric tons, or 23 per cent. Sugar cane accounted for 336,000 metric tons, or 14 per cent of the total consumption volume of bioethanol (please note that more information can be found on the market performance of these individual initiatives in the sugar, palm oil and soybean sections of this report).

FIGURE 6.1 EU BIODIESEL AND BIOETHANOL CONSUMPTION BY FEEDSTOCK, 2010.



Source: van de Staaij et al., 2012.

"IN THE EUROPEAN UNION, BIODIESEL ACCOUNTS FOR APPROXIMATELY 70 PER CENT OF ALL RENEWABLE ENERGY USED FOR TRANSPORTATION."

TABLE 6.2 EU BIODIESEL CONSUMPTION DIFFERENTIATED BY FEEDSTOCK AND MAIN FEEDSTOCK REGIONS, 2009–2010.

Crop	2009 (1,000 mt)		2010 (1,000 mt)	
Rapeseed	European Union	3,763	European Union	3,878
	Ukraine	265	Ukraine	251
	Canada	177	Canada	212
	Australia	137	Russia	80
	Other	194	Other	109
	Total	**4,536**	**Total**	**4,530**
Soybeans	European Union	92	European Union	86
	Argentina	744	Argentina	1,191
	Brazil	670	Brazil	416
	United States	278	United States	221
	Other	115	Other	302
	Total	**1,899**	**Total**	**2,216**
Palm oil	European Union	43	European Union	4
	Indonesia	561	Indonesia	774
	Malaysia	159	Malaysia	189
	Côte d'Ivoire	8	Thailand	7
	Other	4	Other	3
	Total	**775**	**Total**	**976**
Others	**All**	**1,881**	**All**	**1,870**

Source: van de Staaij et al., 2012.

International Sustainability and Carbon Certification (ISCC)

ISCC is a holistic biomass standard that has an emphasis on greenhouse gas emissions. It is distinct from the other voluntary sustainability standards covered in this section in that it was fully financed by a government agency (German Federal Ministry of Food, Agriculture and Consumer Protection via the Agency for Renewable Resources, or FNR) until 2012, when it became an independently operating organization (ISCC, n.d.-a). ISCC was one of the first organizations to have its standard approved under EU-RED in 2011 and is an important source of sustainable biofuels to the European market, with over 2,000 valid certificates issued by December 2013 (ISCC, 2013). The ISCC Chain of Custody recognizes all other EU-RED approved systems (including Bonsucro, RSB, RTRS and RSPO) (SCS Global Services, n.d.), and membership fees to the standard have been observed at a fraction of those of other sustainable biofuel standards (e.g., Bonsucro, RSB and RTRS) (Pacini & Assunção, 2011). Although no numbers are published by ISCC regarding total volumes of biofuels produced under the standard, estimates for double certification with ISCC among other standards are high, perhaps not surprising given the standard's recognition of other Chain of Custody channels. For instance, one industry expert reported that in 2012, 1.5 million metric tons to 2.0 million metric tons of palm oil had been certified under both ISCC and RSPO and sold as ISCC certified (J. Kees Vis, Unilever, personal communication, December 13, 2013).

TABLE 6.3 EU BIOETHANOL CONSUMPTION DIFFERENTIATED BY FEEDSTOCK AND MAIN FEEDSTOCK REGIONS, 2009–2010.

Crop	2009 (1,000 mt)		2010 (1,000 mt)	
Wheat	European Union	840	European Union	581
	Ukraine	10	Switzerland	25
	Canada	3	Ukraine	6
	United States	1	Mozambique	4
	Other	2	Other	8
	Total	**856**	**Total**	**623**
Maize	European Union	326	European Union	344
	United States	19	United States	122
	Ukraine	5	Brazil	8
	Serbia	4	Ukraine	7
	Other	2	Other	9
	Total	**356**	**Total**	**490**
Sugar beet	European Union	447	European Union	733
	Other	1	Other	2
	Total	**448**	**Total**	**735**
Sugar cane	European Union	64	European Union	0
	Brazil	269	Brazil	234
	Guatemala	33	Peru	26
	Pakistan	20	Bolivia	20
	Other	98	Other	56
	Total	**484**	**Total**	**336**
Others	**All**	**100**	**All**	**262**

Source: van de Staaij et al., 2012.

TABLE 6.4 RSB CERTIFICATES, 2012.

Participating operator name	Country	Operator type	Feedstock type	Biofuel type
Shoalhaven Starches Pty Ltd (Manildra Group of Companies)	Australia	Biofuel producer	Waste starch from wheat processing	Ethanol
Maple Biocombustibles S.R.L.	Peru	Biofuel producer	Sugar cane	Ethanol
Global Clean Energy	Mexico	Feedstock producer	Jatropha curcas	Biodiesel
Dynamic Fuels LLC	United States	Biofuel producer	Wastes, animal by-products, greases and vegetable oils	Renewable diesel/ biojet mix
Piedmont Biofuels Industrial, LLC	United States	Biofuel producer	Used cooking oil	Biodiesel
Addax Bioenergy Sierra Leone (SL) Limited	Sierra Leone	Feedstock producer	Sugar cane	Ethanol
SkyNRG	The Netherlands	Biofuel producer	Used cooking oil and other feedstocks	Supply chain and logistics for biokerosene/jet fuel

Source: RSB Services, 2011.

Roundtable on Sustainable Biomaterials (RSB)[2]

The RSB certification system was launched in March 2011 as a set of comprehensive sustainability criteria that allows eligible producers to show buyers and regulators that their products have been obtained without harming the environment or violating human rights. The RSB was originally launched as a partnership between the WWF, British Petroleum, Shell Oil, the Brazilian Sugarcane Industry Association, Petrobras and Bunge, among other organizations, to develop a series of principles and criteria for sustainable biofuels.

Since this time, the RSB has issued seven certificates across six countries (see Table 6.4), covering six biofuel producers and one feedstock producer. These seven certified operators use feedstocks such as wheat starch, sugar cane, jatropha, used cooking oil, wastes, greases and animal by-products (RSB Services, 2011). No data on the volumes of stocks produced or sold was available at the time of writing. In April 2013, the RSB changed its scope to include biomass used in all bio-based products.

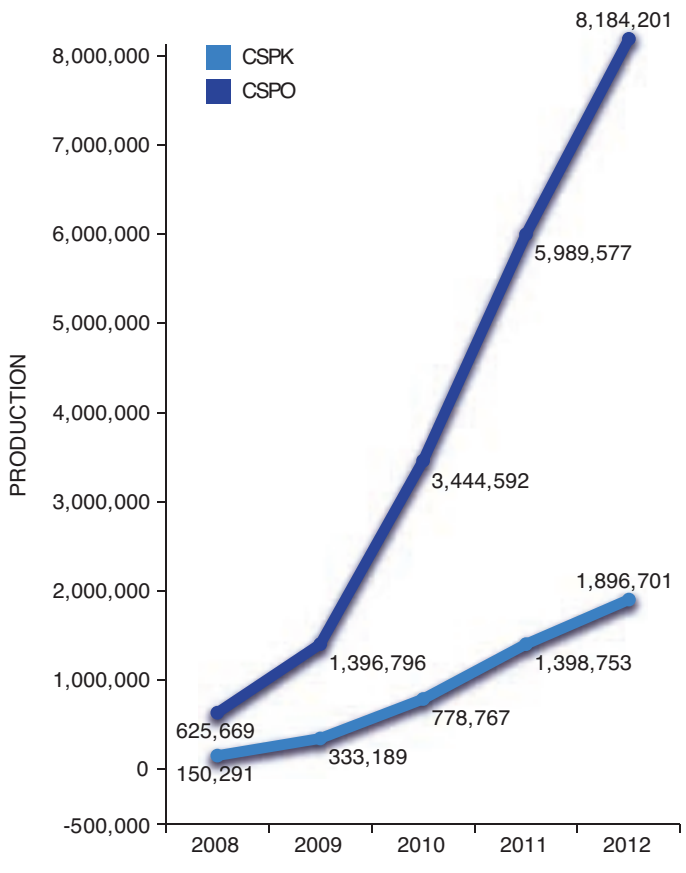
2 Formerly the Roundtable on Sustainable Biofuels.

Roundtable on Sustainable Palm Oil (RSPO)

RSPO-compliant palm oil has grown at 1,200 per cent over the last four years to cover 15 per cent of global production in 2012. Most of this certified production is sourced from Indonesia and Malaysia, but countries such as Papua New Guinea and Brazil also represent important suppliers for RSPO-compliant palm oil.

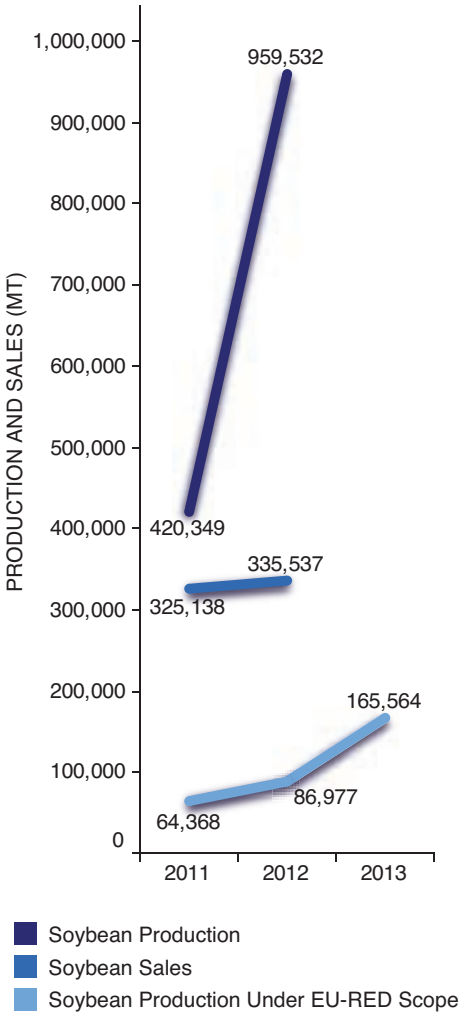
The RSPO Reduction Emissions Directive (RSPO RED) for biofuels supply into the European Union includes additional production and supply chain criteria, such as not allowing palm oil from plantations established after 2008 and only allowing segregated or mass-balance chains of custody and not book and claim. RSPO RED was approved by the European Commission in November 2012, and Neste Oil received the first RSPO RED supply chain certificate for its biofuels supply into the European Union in November 2013 (RSPO, 2012d, 2013). As of 2012, none of the production of RSPO-compliant palm oil (Figure 6.2) was imported under EU-RED, but represents an important potential supply base to the 1.9 million metric tons of palm oil used as biodiesel feedstock in the European Union in 2012 (up from 0.4 million metric tons in 2006) (Gerasimchuk & Koh, 2013). Certified palm oil under RSPO (not necessarily RSPO RED, however) represents over four times the feedstock used for biodiesel production in the European Union.

FIGURE 6.2 RSPO, CERTIFIED SUSTAINABLE PALM OIL AND CERTIFIED SUSTAINABLE PALM KERNEL PRODUCTION, 2008–2012.



Source: S. Yaacob, RSPO, personal communication, April 15, 2013.

FIGURE 6.3 RTRS SOYBEAN PRODUCTION (TOTAL AND UNDER EU-RED SCOPE) AND SALES, 2011–2012.



Source: B. Zeehandelaar, F. Cativiela, RTRS, personal communication, February 28, 2013.

Round Table on Responsible Soy (RTRS)

RTRS production volumes more than doubled from 2011 to 2012, from 420,000 metric tons to 960,000 metric tons, accounting for 0.4 per cent of global soy production by 2012 (see Figure 6.3). Over 2011 and 2012, sales remained stable—around 330,000 metric tons, accounting for 0.1 per cent of global production.

The RTRS EU-RED scheme was approved by the European Commission in July 2011 (RTRS, 2011) and includes additional criteria such as greenhouse gas reduction and carbon saving. Of the 960,000 metric tons of soybeans produced under the RTRS standard in 2012, about 90,000 were certified under the RTRS EU-RED scope in 2012 (9 per cent of total certified production), and 166,000 metric tons in 2013 (17 per cent of 2012 volumes).[3] All RTRS EU-RED production occurred in Argentina (J. Frojan, RTRS, personal communication, September 27, 2013), the world's largest biodiesel exporter. In 2010, there were about 2.5 million metric tons of soybeans consumed for biodiesel imports into the European Union, of which the supply of 2013 RTRS EU-RED certified soybeans accounted for about 7 per cent.[4]

Bonsucro

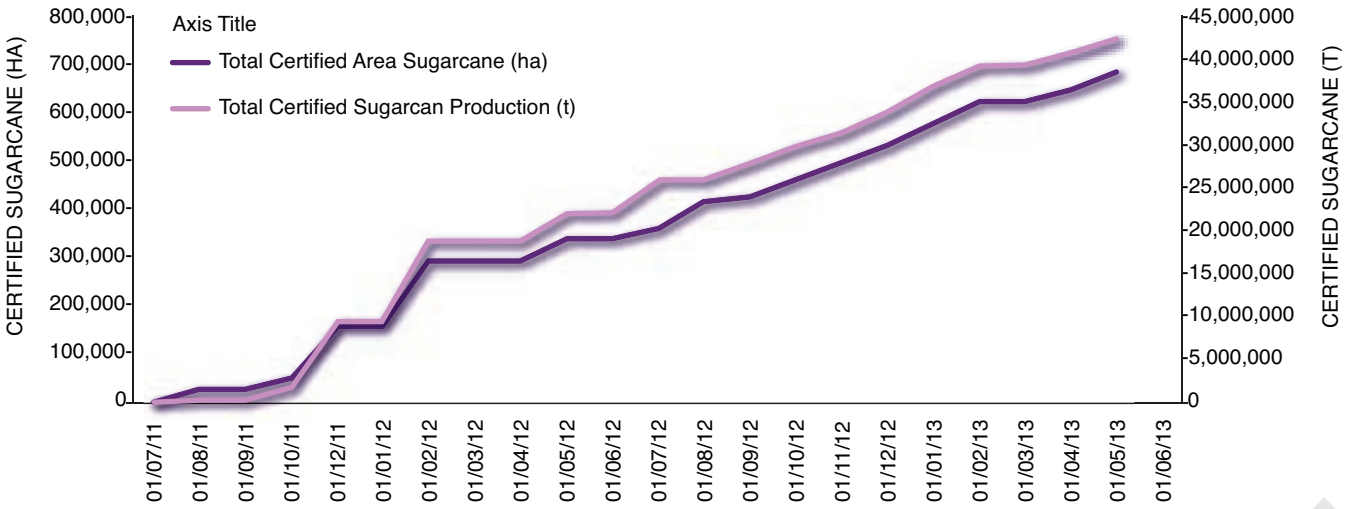
Bonsucro certified sugar cane has grown from nothing in early 2011 to over 700,000 hectares of sugar cane area by mid-2013 (see Figure 6.4), or 2.9 per cent of global sugar cane surface. From this certified area, 3 million metric tons of cane sugar and 2.2 million litres of ethanol were produced.

Bonsucro EU is a standard specifically developed for certification of sugar cane ethanol to be placed on the European market and includes additional criteria regarding, among other things, the conservation of areas that provide ecosystem services in critical situations (e.g., watershed protection) and the restoration of degraded land (Bonsucro, 2013b). The standard was approved by the European Commission in July 2011 (Bonsucro, 2013b). In 2013 there was enough Bonsucro-compliant supply (not necessarily Bonsucro EU supply, however), to cover EU sugar cane feedstock used for bioethanol about 86 times (45.7 million metric tons of Bonsucro-compliant sugar cane versus 534,000 metric tons used by the European Union for bioethanol feedstock in 2010) (Bonsucro, 2013d; van de Staaij et al., 2012).

3 At the time of personal communication with J. Frojan.

4 2010 volumes of soybeans consumed for EU biodiesel (van de Staaij et al., 2013).

FIGURE 6.4 BONSUCRO SUGAR CANE PRODUCTION, AREA AND VOLUME, 2011–2012.



Source: Bonsucro, 2013d.

6.4 PRICING AND PREMIUMS

From the certificate holder to the first buyer, biofuel feedstock premiums were reported at between 0 and 1 per cent (RSPO book and claim) to nearly 6 per cent (RSPO segregated). Although RSPO doesn't formally publish pricing data, some pricing data are available from RSPO's Chain of Custody services, eTrace (a service provided by UTZ), as well as from the RSPO's official broker for the trade (book and claim) of sustainable palm oil certificates, GreenPalm.[5] GreenPalm book and claim premiums range from US$0 to $10 per metric ton, while RSPO mass balance premiums vary between US$10 and $25 per metric ton and RSPO segregated premiums vary between US$15 and $50 per metric ton (WWF, 2012). UTZ Certified is the organization that manages RSPO's mass balance and segregated systems. Based on a 2012 to 2013 average price of $990 per metric ton, the premiums can be expressed in percentage terms as follows: between 0 and 1.0 per cent for GreenPalm book and claim premiums, between 1.0 and 2.5 per cent for RSPO mass balance premiums, and between 1.5 and 5.0 per cent for RSPO Segregated premiums.[6]

A recent KPMG (2013) report suggests that a realistic and conservative premium for RTRS soy would be around US$1.5 per metric ton of certified soybeans (or 0.3 per cent[7]). For certified soy meal, the report suggests that the premiums paid are closer to US$3 to $4 per metric ton (or 0.7 to 0.9 per cent[8]), with higher premiums for certified soy oil, as refiners in the European Union receive a tax rebate when using soy oil to produce biodiesel. This study showed that for producers larger than 2,500 hectares that are able to sell their full crop as RTRS certified, the average payback period for becoming RTRS certified is as little as three years in countries like Argentina and Brazil but ranges up to 4.6 years for medium-sized producers far from certification.

More generally, one industry expert has estimated that premiums fall within the range of €1.50 to €5 per metric ton (0.5 to 1.5 per cent[9]) for RTRS (G. Van der Bijl, Solidaridad, personal communication, 2013). Of course, premiums are not the only incentive for certified biofuel (or biofuel feedstock) production, including expanded market access (especially to the European Union), improved agricultural practices resulting in environmental and yield benefits (both present and future), and improved safety measures.

5 GreenPalm allows RSPO-certified growers to convert their certified oil into GreenPalm certificates, which are then put up for bids on the GreenPalm market. Product manufacturers who use palm oil or palm-based derivatives in their products then place offers for these certificates. These certificate purchases allow manufacturers to offset their actual use of conventional palm oil with the equivalent amount of certificates and thus be able to claim that their company or products support the production of RSPO CSPO (GreenPalm, n.d.). The full value of each certificate is then sent back to the RSPO producer, who can then reinvest this premium to help tackle the environmental and social issues created by the production of palm oil.

6 UTZ Certified provides the IT platform of traceability to the RSPO relating to physical trades.

7 Percentages calculated based on Chicago Soybean Meal Futures price of US$490 per metric ton in September 2013.

8 Percentages calculated based on Chicago Soybean Meal Futures price of US$490 per metric ton in September 2013.

9 To calculate percentage premium, these figures were converted to U.S. dollars using the EUR/USD exchange rate of 1.38 on October 29, 2013.

6.5 CHALLENGES AND OPPORTUNITIES

Biofuels sustainability will be crucial to ensuring that the expansion of the biofuels sector does not lead to adverse social and environmental effects. Public policies will be the main drivers behind the sector's development over the next decade and will affect both the amount of biofuels that are produced and consumed and the sustainability intensity of the feedstocks that are being used to produce these biofuels. With the recent evidence suggesting that many of the biofuel feedstocks are less sustainable than initially thought, the biofuels policy landscape is currently undergoing a transformation, and the coming years will tell how these sustainability concerns will impact the sector. One of the key challenges facing voluntary sustainability initiatives in particular will be the degree to which they can play a role in ensuring that their systems address or compensate for some of the larger macro issues related to biofuel sustainability—such as land transformation, relative greenhouse gas emissions and food security. Regardless of these challenges, the current policy environment is sufficiently well rooted such that one can expect significant continued growth within the voluntary sustainability standard biofuels sector in the coming years.

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