Sustainability as a Success Factor for Palm Oil Producers Supplying the European Vegetable Oil Markets

Emanuele Novelli*

ABSTRACT

In Europe, due to their voluntary commitments, the leading businesses which are active in the food, feed, detergent and chemical sectors are moving towards procurement of sustainable and deforestation-free vegetable oils for their supply chains. The amended European Union (EU) biofuel legislation also requires them to comply with specific sustainability criteria for vegetable oils in the biofuels market. Both growing requirements of private businesses and EU biofuel legislation highlight the importance of sustainability certification for palm oil suppliers. Moreover, for those markets where a substitution of palm oil is unlikely due to technological and cost reasons, the implementation of the EU Regulation 1169/11 on the Provision of Food Information to Consumers, further prompts the procurement of sustainable certified palm oil.

Suppliers of sustainable palm oil could profit from these favourable circumstances only if their sustainability certification were granted through reliable and credible sustainability standards. Through the use of advanced tools granting deforestation-free supply chains, such as the Global Risk Assessment Services (GRAS), and the adoption of requirements even more stringent than the ones demanded by the European biofuel policy, the International Sustainability and Carbon Certification scheme (ISCC) emerges, among others, as a highly reputable scheme. The objectives of this article are to describe the current European regulatory framework, the impacts deriving from it and the reasons why sustainability certification, if supported by advanced tools and released by highly credible standards such as ISCC, will be the key to access the European energy, food, feed, detergent and chemical markets.

* Meo Carbon Solutions GmbH,
Hohenzollernring 72,
50672 Köln,
Germany.
E-mail: novelli@meo-carbon.com

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INTRODUCTION

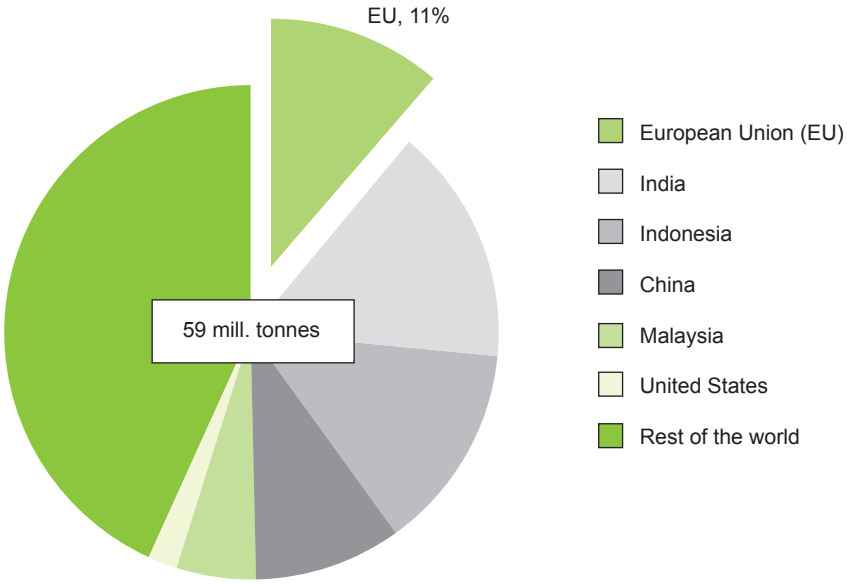
The European Union (EU), is the third most important consumer of palm oil in the world after India and Indonesia (*Figure 1*).

Palm oil is the second most consumed vegetable oil after rapeseed oil in EU. It accounts for one-third of all consumed volumes of vegetable oils in 2013 (*Figure 2*). According to *Oil World* (2014), the main countries of origin for the import of palm oil in 2013 were Indonesia and Malaysia.

In 2013, the Netherlands, Germany and Italy were the main palm oil importers as shown in *Figure 3*. In EU, attention around the potential negative impacts related to palm oil production has in recent years increased, induced by information campaigns of NGO (WWF DE, 2013) and journalistic enquiries (The Wall Street Journal, 2015; Report, 2015).

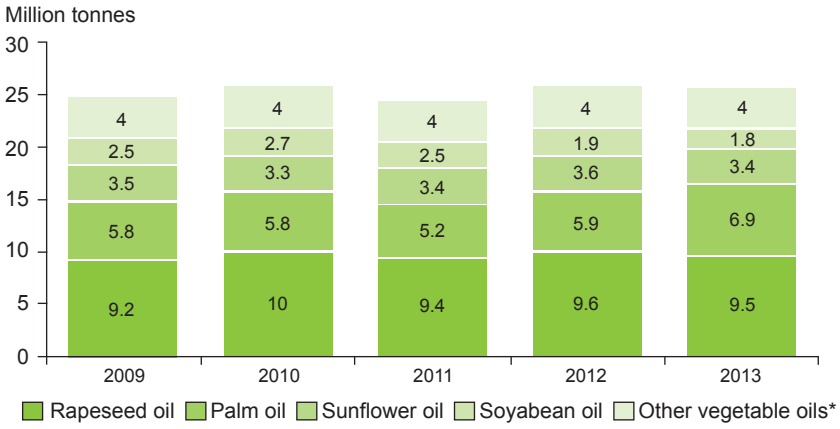
This situation has prompted many European palm oil processors, associations of goods manufacturers using palm oil as an ingredient, and public institutions to investigate which industry sectors are using palm oil. The final outcome of this investigation shows that the energy, food, feed, chemical and the detergent sectors are main consumers of palm oil in Europe.

In this respect, the German market is taken as a proxy for identifying the degree of palm oil and palm kernel oil usage among the identified sectors due to its leading position in the European economy. According to a study conducted by Meo Carbon Solutions (2015), in 2013, consumption of palm oil and palm kernel oil amounted to 1.36 million and 0.32 million tonnes, respectively. The energy sector was the largest consumer of palm oil at 753 500 t, followed by the food sector at 315 700 t (*Figure 4*). The feed and the chemical



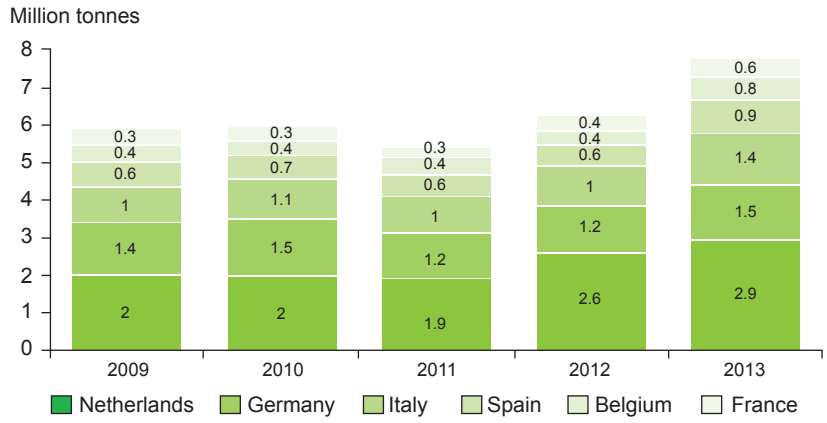
Source: USDA (2015).

Figure 1. Global consumption of palm oil in the period mid 2014/mid 2015 by country.



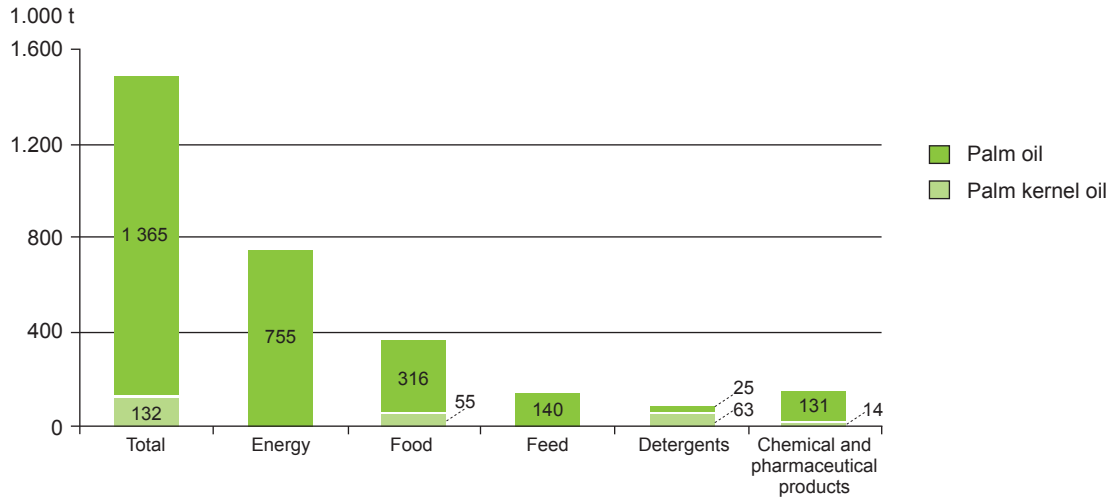
Note:*Covers olive oil, coconut oil, palm kernel oil, castor oil, linseed oil, groundnut oil, cotton oil and sesame oil.
Source: *Oil World* (2014).

Figure 2. Domestic use of vegetable oils in EU-28.



Note: Palm oil includes both crude and refined palm oil. Intra-EU trade is included in the value of the Member States.
Source: EUROSTAT (2014).

Figure 3. Imported palm oil volume of top six European importers.



Source: Meo Carbon Solutions (2015), based on company interviews, expert interviews, workshops, literature research and data from the Federal Statistical Office of Germany.

Figure 4. Consumption of palm oil and palm kernel oil by market sectors in Germany for 2013.

sectors consumed 140 000 t and 131 000 t, respectively. Meanwhile, the detergent sector consumed only 24 500 t of palm oil. For the consumption of palm kernel oil, the situation is totally different from palm oil consumption. The detergent sector led at 62 800 t, followed by the food sector at 55 000 t. The chemical and pharmaceutical sectors used only 14 200 t of palm kernel oil.

Even though there are no technological limitations to the use of palm kernel oil in both energy and feed products, there was no palm kernel oil consumption in these two sectors. The absence of palm kernel oil is due to its higher market prices in comparison with those of palm oil (World Bank, 2015). By contrast, in the food and detergent sectors, the technological features of the final products do not allow an interchangeable use of palm oil and palm kernel oil. For many products of these two sectors, the demanded fatty acid profile requires the use of palm kernel oil.

The study of Meo Carbon Solutions (2015) provides a detailed overview on the amount of certified palm oil for relevant industry sectors and segments in Germany. Although the values reported in *Table 1* refer to the year 2013, we could consider that the values reflect, for the certified volumes, a similar situation for the years 2014 and 2015 for all non-energy sectors[1] , as the latest Annual Communication Progress from the Roundtable on Sustainable Palm Oil (RSPO) 2015 describes a constant average yearly uptake of certified crude palm oil on overall

[1] The amount of of sustainable certified palm oil in the German energy sector lowered from 753 500 t in 2013 to 500 700 t in 2014 (BLE, 2014).

TABLE 1. AMOUNT OF CONSUMED AND CERTIFIED PALM OIL AND PALM KERNEL OIL ACCORDING TO SECTORS IN GERMANY FOR THE YEAR 2013

Sectors in which palm oil and palm kernel oil were consumed in Germany (2013)

Sector	Consumed PO (t)	Certified PO (t)	%	Consumed PKO (t)	Certified PKO (t)	%
Food	315 700	164 420	52	54 940	21 750	40
Feed	140 000	1 600	1	-	-	-
Energy	753 500	753 500	100	-	-	-
Detergent and body care	24 500	11 600	47	62 800	29 000	46
Chemical/pharmaceuticals	131 000	17 710	14	14 200	1 200	8
Total	1 364 700	948 830	70	131 940	51 950	39

Note: PO - palm oil.
PKO - palm kernel oil.
Source: Meo Carbon Solutions (2015), based on company interviews, expert interviews, workshops, literature research, data from the Federal Statistical Office of Germany and RSPO ACOP reports.

supplied palm oil[2] for the years 2013-2015.

One hundred percent of the palm oil used in the energy sector in Germany is certified as sustainable as this is a requirement of the Renewable Energy Directive[3]. By contrast, the penetration of certified material is 52% for the food and 47% for detergent sectors (*Table 1*). Overall palm oil used is below 15%. The higher penetration of certified material in the food and detergent sectors when compared with the chemical and pharmaceutical sectors could be due to the fact that products in the former sectors are closer to final consumption. However, in the chemical and pharmaceutical industries, palm oil is an intermediate production goods, and final consumers are often not aware that this raw material has been used in the production processes of chemical and pharmaceutical products. As a consequence, there is no direct pressure from final consumers for the use of sustainable material in these two industries, and this has resulted in lower certified palm oil amounts in these industries. The same explanation holds for the feed sector (Meo Carbon Solutions, 2015).

The level of penetration of certified material displayed in *Table 1* provides an indication of the potential volumes of certified palm oil that could still be delivered to the German market in case businesses of all sectors should commit to 100% sustainable palm oil and palm kernel oil. In this respect, it is useful to mention the existence of national initiatives fostering the exclusive use of certified palm oil and palm kernel oil that have been established in Germany, Netherlands, France and the United Kingdom. These initiatives set mandatory targets for their members to use 100% sustainable palm oil. Belgium, Denmark, Italy, Norway and Sweden also announced the formation of sustainable palm oil procurement initiatives by December 2015. The evidence of increasing national sustainability initiatives can be interpreted as a positive signal for the potential uptake of certified palm oil volumes in EU.

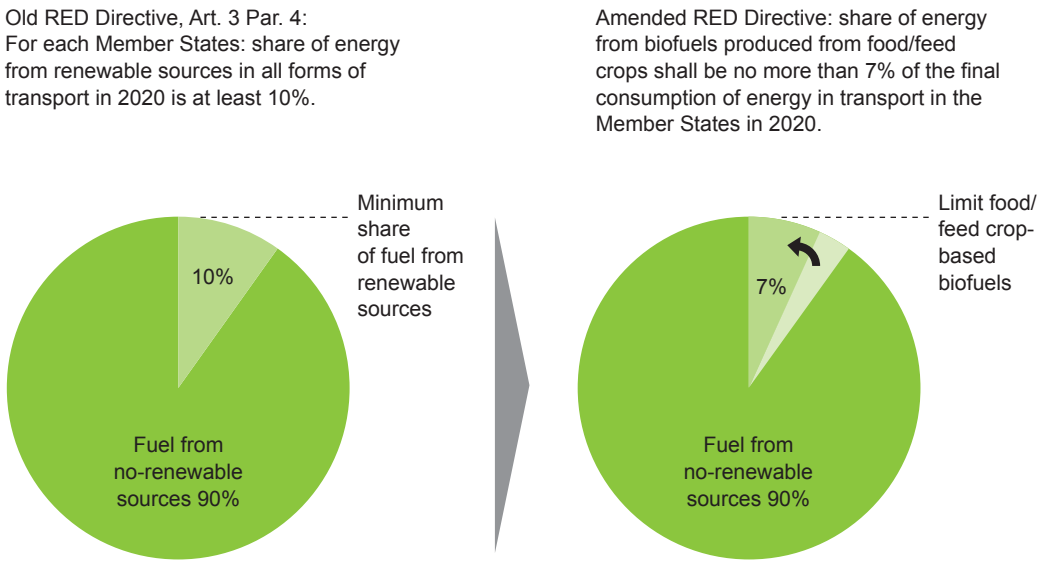
THE EUROPEAN REGULATORY FRAMEWORK FOR VEGETABLE OIL MARKETS

The energy and the food sectors are strongly regulated in EU, and two recent legislative changes in these sectors are likely to cause major impacts in the future on the amounts and quality of supplied palm oil to this nation.

One regulatory change, affecting the energy sector, is the amendment of the Directive 2009/28/EC on the Promotion of the Use of Energy from Renewable Sources. The amendment (Directive 2015/1513) introduces a cap for first generation biofuels (biofuels whose feedstock corresponds to crops grown on agricultural land for energy purpose) at 7% on transport energy demand by 2020. The previous legislative act instead set a

[2] Refers to RSPO members. Relevant product manufacturers using palm oil actively in the German market and global relevant palm oil producers are members of RSPO.

[3] Directive 2009/28/EC recently amended by the EU Directive 2015/1513.



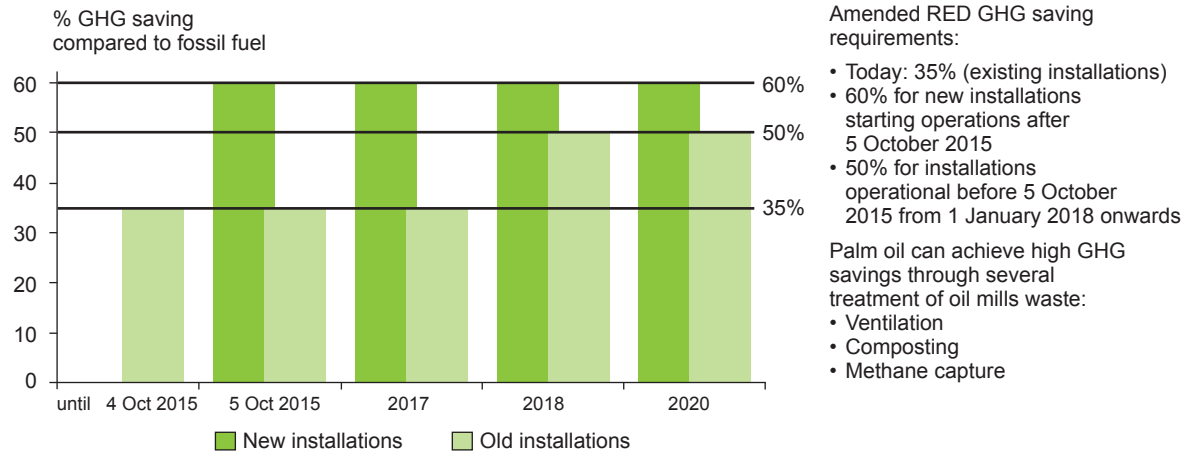
Source: Meo Carbon Solutions (2015), based on Directive 2009/28/EC on the Promotion of the Use of Energy from Renewable Sources and amending Directive 2015/1513.

Figure 5. Change in regulatory framework for renewable energy and effects on first generation biofuel share on total transportation's energy demand.

minimum mandatory quota of 10% of unspecified generic renewable sources (*Figure 5*). As a result, the amendment of Directive 2009/28/EC fosters the use of alternative feedstock for biofuels production while limiting first generation vegetable oils in the EU biofuels market.

Within this limiting scenario, palm oil can however maintain high relevance for European biofuel producers due to the high greenhouse gas (GHG) emissions saving potential generated through methane capture technologies. If these technologies are adopted, it would be possible for biodiesel producers to easily satisfy the GHG emission savings requirements for existing installations as requested by the amended renewable energy directive (*Figure 6*). In fact, starting from January 2018, it is required for installations, active prior to 5 October 2015, to produce a biofuel which is able to achieve at least 50% of GHG emissions savings in respect to the reference value of 83.8 g CO_2eq per MJ of fossil fuel produced. This would correspond to a maximum level of GHG emissions of 41.9 g CO_2eq per MJ of biofuel produced. New installations starting their operations after 5 October 2015 are required to achieve a level of GHG emissions savings of 60%, corresponding to a maximum amount of 33.52 g CO_2eq per MJ of biofuel produced. Biodiesel installations producing palm methyl ester based on a feedstock supplied by palm oil mills with methane capture technologies, could use, according to Directive 2009/28/EC, a default GHG emissions value of 37 g CO_2eq per MJ of biofuel produced. This would correspond to a 56% in GHG savings in respect to the fossil fuel comparator. Moreover, palm oil mills could reduce their GHG emissions through the adoption of alternative treatment practices for palm oil mill effluents, such as composting and ventilation, thereby further contributing to the achievement, for biodiesel plants, of the GHG saving targets specified in the Directive 2015/1513. In order to support palm oil producers in achieving better GHG emission performances, the International Sustainability and Carbon Certification scheme (ISCC) system set up a technical working group on GHG emission reductions for palm oil producers in South-east Asia.

Another regulatory change, the implementation of EU Regulation 1169/2011 on the Provision of Food Information to Consumers, makes it transparent to consumers, through label declarations, which ingredients are used in the manufacture of food products. In this second case, impacts could either be a substitution of palm oil with other edible oils, with the manufacturers benefiting from fewer consumer criticisms, or, for products in which palm oil cannot be replaced due to technological or cost reasons, the issue of sustainability certification arises as a core-necessity. Evidence of this second market strategy option can be found in many sustainability strategies of the European market leaders in the food and detergent sectors (*e.g.* Unilever, 2016; Henkel, 2016). Specifically, there is a common denominator underlying the businesses' sustainability strategies, namely, by subscribing



Source: Meo Carbon Solutions (2015), based on Directive 2009/28/EC on the Promotion of the Use of Energy from Renewable Sources and amending Directive 2015/1513.

Figure 6. Greenhouse gas (GHG) emission saving requirements for new and existing installations producing biofuels according to the amended renewable energy directive.

to sustainability initiatives and adopting sustainability certifications, they highlight, among other measures, their commitment to no-deforestation. Most likely deforestation is identified as a key critical phenomenon for its impact on the environment and local communities, which could reflect negatively on the businesses' reputations. Therefore, it is crucial that sustainability certification is able to verify and grant deforestation-free supply chains by means of sound empirical methods such as the remote sensing analysis offered by the Global Risk Assessment Services (GRAS). Sustainability certification standards recognised by the European Commission under the renewable energy directive, like the (ISCC), are already in a position to certify deforestation-free supply chains, as this is a mandatory requirement for the production of biofuels to be complied with the fulfilment of the mandate specified by the Directive 2015/1513. ISCC makes use of GRAS for the maintenance of high quality certifications attesting to deforestation-free supply chains for food, feed, energy and chemical products.

DEVELOPMENTS IN PALM OIL CONSUMPTION IN EUROPE

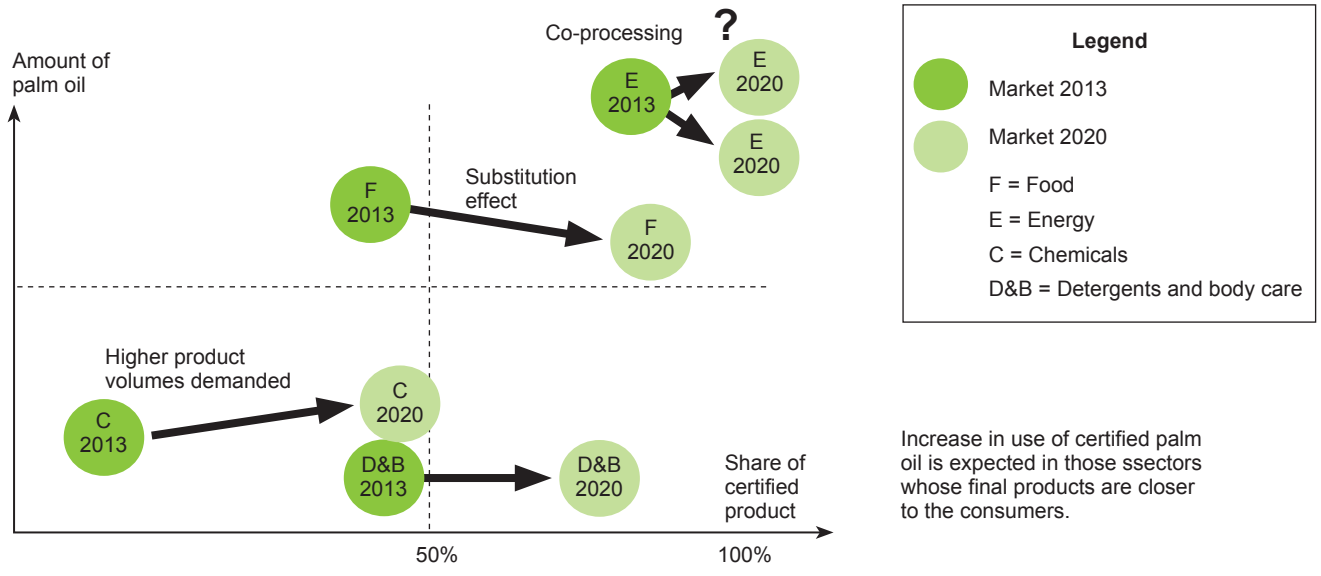
The mandate to reduce biofuel volumes from 10% to 7% resulting from the Directive 2015/1513 prompts palm oil[4] producers to consider markets other than for energy. Nevertheless, increasing penetration into sectors close to final consumption, and therefore strongly influenced by consumer choice, such as the food and the detergent sectors, will be possible through the offer of certified volumes. These outcomes have been highlighted by an interactive workshop involving representatives from key sustainability and purchasing positions in the German industry which was organised by Meo Carbon Solutions within the framework of the study already mentioned in the Introduction. The objective of the workshop was to elicit the future development of those market sectors relevant to the use of palm oil. According to the findings of this workshop, growth in the share of certified volumes can be expected in the food, chemicals and detergent sectors (*Figure 7*).

Based on the workshop's outcomes, the food sector will play an important role in the future in increasing the sourcing of certified material. The highlights are:

- a change in social structure and lifestyle, with an increasing tendency towards ready-to-eat meals which rely on a large-scale use of vegetable oils; and
- the self-commitment of many retailers towards the achievement of specific sustainability targets.

A combination of these phenomena has been judged by the food industry experts as drivers for an expanded share of certified palm oil. Nonetheless, in absolute terms, the volumes of certified material could still shrink due to the effects of palm oil substitution resulting from the EU regulation on transparent labelling of food

[4] The term 'palm' oil as it is used in this section, unless otherwise specified, includes palm oil, palm kernel oil and all processed derivates of palm oil.



Source: Adapted from Meo Carbon Solutions (2015), analysis of palm oil sector in Germany on behalf of FONAP.

Figure 7. Potential development of market sectors.

ingredients. In any case, for the certified material in the food sector and in relation to the chain of custody form, it is expected that there will be an uptake of segregated palm oil.

The change in social patterns will also affect the detergents and body care products industries, with increasing interest in and access to personal care products, and with more attention given to requirements of non-material product features, such as sustainability of the raw materials used.

By contrast, the increasing amount of palm oil used in the chemicals industry is strictly related to the predicted growth of the market in the future. The hypothesis in this case is that a larger available supply of certified material and its relatively lower price would result in major interest by chemical products manufacturers. In the detergents and body care products industries as well as in the chemicals industry, it is likely there will in the future be an uptake of chain of custody certification in the form of book and claim. In fact, guaranteeing the traceability of palm oil, as required by a mass balance or a segregation system, implies a complex monitoring of the numerous processing steps of these industries.

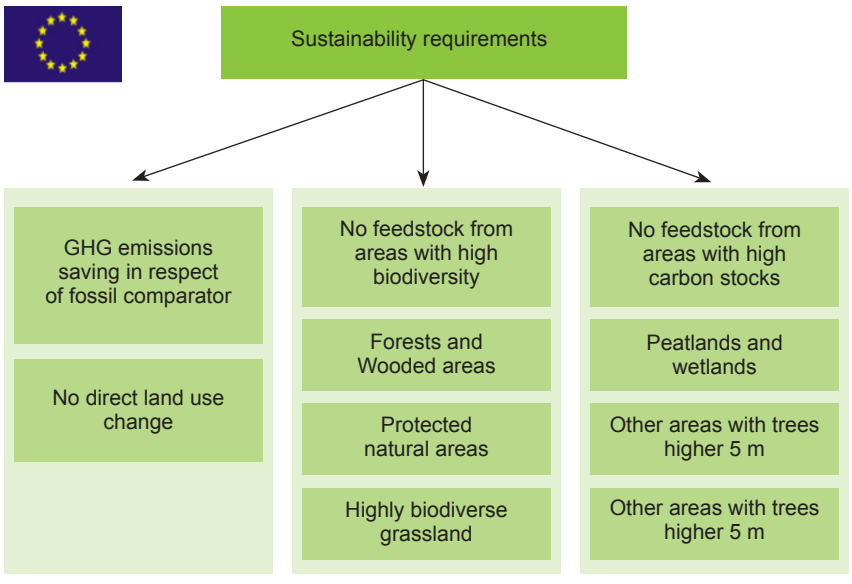
An increase in palm oil demand in the European market in the future could also derive from the energy sector through the adoption of co-processing technologies by traditional mineral oil refineries. This technology allows a simultaneous processing of vegetable oil and fossil oil, and it offers an alternative to the current biodiesel value chain of refining and esterification of crude palm oil. Mineral oil companies delivering transportation fuel to EU could directly produce, through the co-processing technologies, the necessary amount of biofuels by sourcing crude vegetable oil. In this case, traditional European bio-refineries and biodiesel plants, which also process, in parallel to palm oil, other European vegetable oils (such as rapeseed oil) would be excluded as biofuel suppliers. This possible scenario would further support expansion of the crude palm oil supply, as the prices for this vegetable oil are lower than for the others in the European market (AMI, 2014), and mineral oil refineries in EU would potentially source mainly palm oil. By contrast, if no economic profitability through co-processing is present and adoption of methane-capture technologies by palm oil mills is excluded, the high GHG emissions associated with the production of crude palm oil (BioGrace, version 4d) could be an entry barrier to the EU energy market due to the increasing GHG emission saving requirements (*Figure 6*) in the future set by the Directive 2015/1513.

SUSTAINABILITY AS A REQUIREMENT FOR FUTURE SUCCESS IN THE EUROPEAN MARKET

For all sectors mentioned in the previous section, higher consumer expectations and the debate around the sustainability theme will make in the future the fulfilment of sustainability requirements (*Figure 8*) a necessary condition for accessing and remaining in the European market.

As an example of the operationalisation of such a set of requirements, we can mention the positive experience of ISCC which derived principles (*Figure 9*) to be complied with vegetable oil producers, and which are even more stringent than the one proposed by the European legislators.

The reliability of a certification system is not a secondary requisite for the final consumer. In fact, a major key criterion for palm oil producers is the choice of an adequate certification scheme.



Source: Directive 2009/28/EC on the Promotion of the Use of Energy from Renewable Sources and amending Directive 2015/1513.

Figure 8. Example of sustainability requirements as defined by the EU Directive 2015/1513 amending the Renewable Energy Directive 2009/28/EC and the Fuel Quality Directive 98/70/EC.

PRINCIPLE 1	PRINCIPLE 2	PRINCIPLE 3
Zero deforestation Protection of primary forests, high carbon stock areas, peat- and wetlands, protected area and highly biodiverse areas	**Good agricultural practice** Agricultural and forestry production shall protect soil, water and air and ensure a sustainable use of land	**Safe working conditions** Ensure workers health and safety during work. Improve competence and knowledge via training
PRINCIPLE 4	**PRINCIPLE 5**	**PRINCIPLE 6**
Social conditions Ensure good labour conditions and limit impacts to surrounding communities	**Compliance with laws** Comply with all region and national laws and international treaties	**Good management practices** Recording system and compliance of subcontractor

Source: ISCC System, Document ISCC EU 202 on Sustainability Requirements.

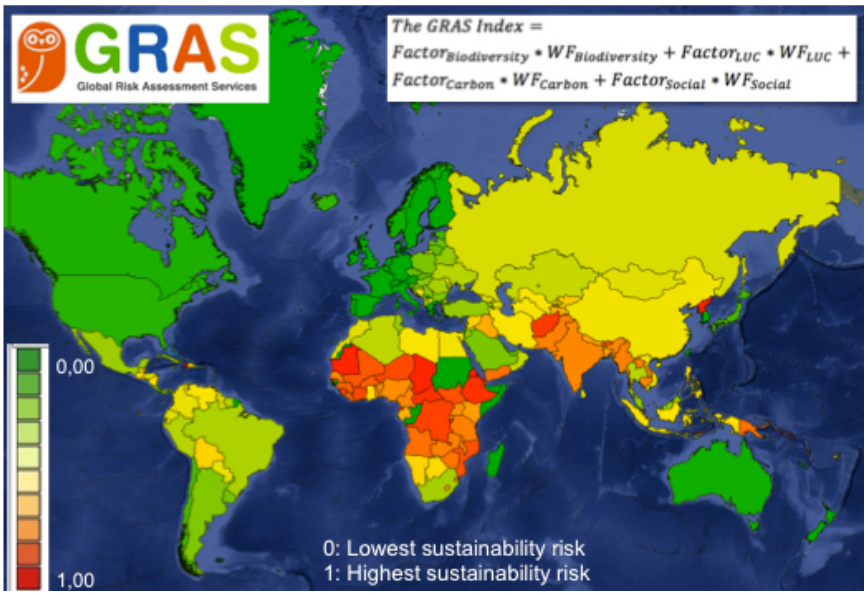
Figure 9. Sustainability certification principles of International Sustainability and Carbon Certification (ISCC).

Only if the certification scheme is credible can the consumer trust the commitments and product claims of the certified companies. In this context, an information system based on sound hard data such as GRAS can offer crucial support.

GRAS is an innovative web platform that provides information about ecological, social sustainability and land use change. Many stakeholders, such as certification bodies, auditors, companies, investors as well as authorities and NGO, have a strong interest in assessing the actual risk for the sustainability of agricultural or forestry production. This web platform has the objective of supporting these stakeholders in monitoring sustainability requirements and in implementing no-deforestation policies. This is possible on an operational base by providing elaborate information and measurable indicators on biodiversity, carbon stock, land use change and social indices, and by reporting it in the form of easy-to-interpret geospatial maps.

GRAS evaluates such indicators and synthesises them under one single index. The GRAS-Index is capable of gathering and merging all relevant data and displaying the overall score as a simple and easy-to-use value which is representative of a region or a whole country (*Figure 10*).

A specific application provided by GRAS is the recognition of deforestation and conversion of grassland into plantations/arable land. Finding reliable proof that (if and when) land use change took place is rather difficult. There is no clear evidence on-site that gives hints if a field was converted 20 years or 20 months ago except for local witnesses or official land use documents. However, the use of satellite images and an innovative algorithm, based on detecting land use change from Moderate-resolution Imaging Spectro-radiometer (MODIS) Greenness Index Time Series, makes it possible for GRAS to spot where and when deforestation practices took place. This methodology is named the GRAS Enhanced

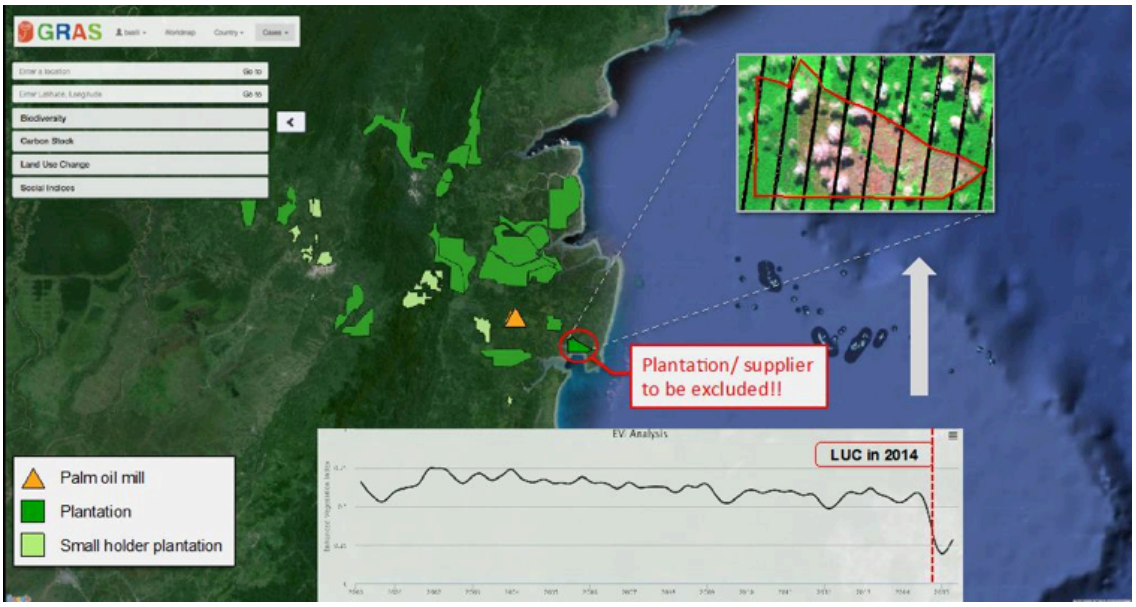


Source: GRAS (Global Risk Assessment Services).

Figure 10. Example of a Global Risk Assessment Services (GRAS) map displaying countries' sustainability risk according to the GRAS-Index value.

Source: GRAS (Global Risk Assessment Services).

Figure 11. In-depth analysis of land use change through the Global Risk Assessment Services (GRAS) system.



Source: GRAS (Global Risk Assessment Services).

Figure 12. Use of Global Risk Assessment Services (GRAS) tool for identifying suppliers conducting deforestation.

Vegetation Index (EVI). By knowing the specific point of time of land use change, an in-depth analysis through Landsat images (*Figure 11*) can be performed and, if land use change occurred, cases of deforestation for the production of oil palm can be highlighted.

Palm oil derived from deforested areas could then be excluded (*Figure 12*) from the certified supply chain, which in turn confers reliability to the sustainability certification system supported by GRAS.

CONCLUSION

Due to both recent regulatory changes and businesses' voluntary commitments, sustainability certification will play a central role in the marketing of vegetable oils exported to Europe. A credible sustainability certification can support the further penetration of palm oil in the European market and reinforce the reputational capital of palm oil producers already active in Europe. Innovative tools such as GRAS contribute to the reliability of sustainability certification, enhancing the credibility of certification systems, and therefore supporting the increase in trust for certified material and its appeal among European consumers.

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