



YOUR BROKER FOR WASTE-BASED
FEEDSTOCK & BIODIESEL

European waste-based biodiesel and glycerine markets



GREENEA

5 chemin des Perrières

17330 Coivert - France



GREENEA

Rumunská 29

120 00 Prague - Czech Republic

T. +33 (0)5 79 97 97 50
F. +33 (0)5 46 33 86 18

WWW.GREENEA.COM
contact@greenea.com



Agenda

- | | | | |
|---|--------------------------|--|-------|
| 1 | EXECUTIVE SUMMARY | Overview of key findings | P. 4 |
| 2 | EUROPEAN MARKET | Waste-based feedstock and biodiesel, glycerine and HVO | P. 5 |
| 3 | SUMMARY | Possibilities and limitations for Asian producers | P. 12 |
| 4 | GREENEA | Company introduction | P. 13 |

Acronyms & definitions

UCO: Used Cooking Oil

UCOME: Used Cooking Oil Methyl Ester, biodiesel made from UCO

Tallow cat 1/2: Sterilized animal fat from slaughter house that is consider high risk for human/animal consumption

TME: Tallow Methyl Ester, biodiesel made from tallow cat1/2

DC: Double counting. A system promoting second-generation (from waste and residues) biofuels by assigning them double credit in the blending mandate

FFA: Free Fatty Acids or acids oils that can be used for biodiesel production

ISCC EU: Most well-known sustainability certification scheme used in Europe.

GHG saving: Green House Gas Saving value used to reach the mandate in Germany

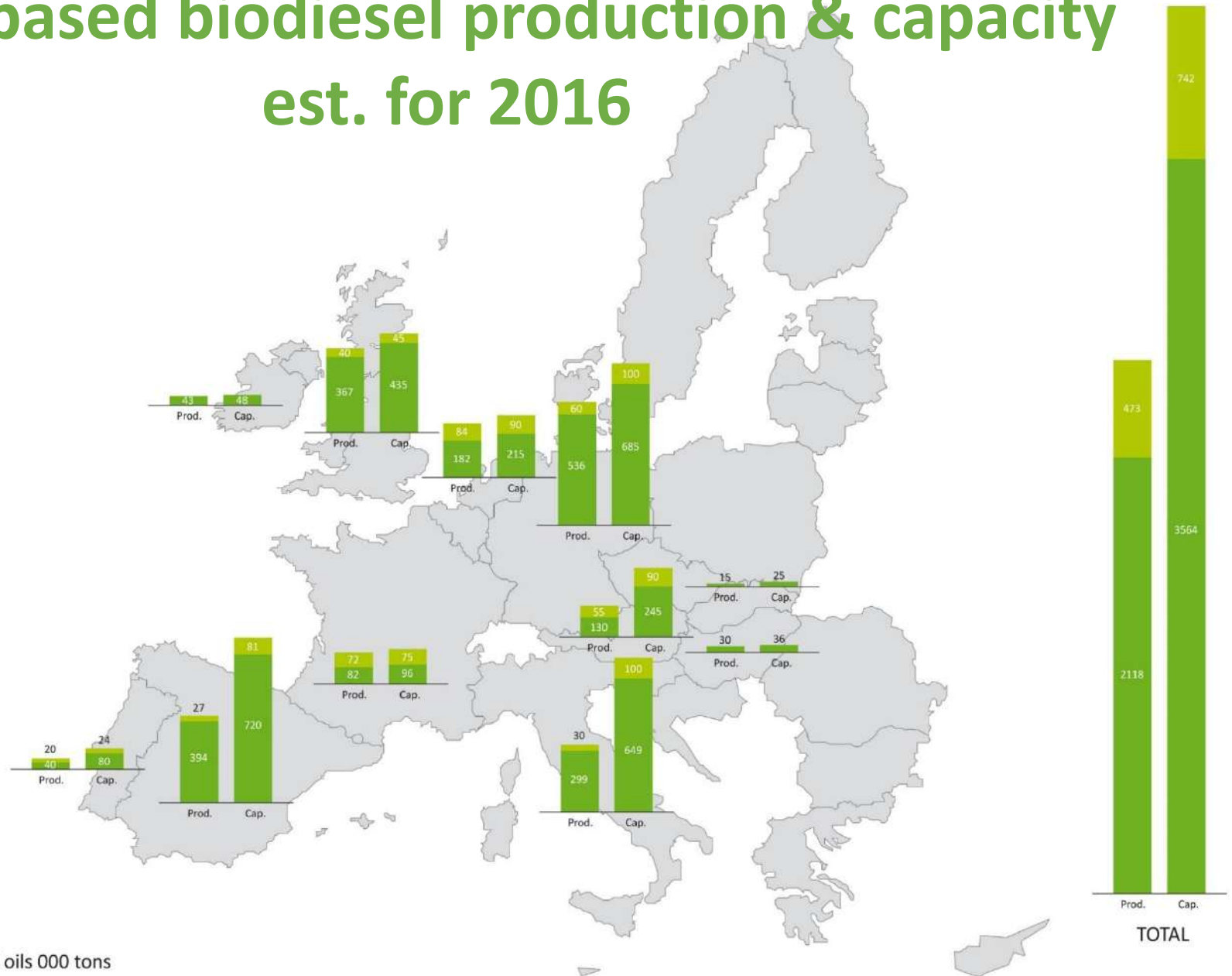
Executive summary

- There is a number of issues that the biodiesel market had to face in the last 18 months among which: **high volatility of currency rates, drop of fossil energy prices against high veg-oil prices and a lack of market liquidity.**
- In Europe, **the supply of biodiesel grew significantly between 2015 and 2016.** Higher production means also an increased need for feedstock importation.
- **In the EU, producers require feedstock to be ISCC EU certified,** which creates a market entry barrier. However, more and more Asian collectors and biodiesel producers get certified, which gives them an advantage over companies from other continents. In addition to the ISCC certification, **biodiesel buyers request also GHG saving calculation, double counting schemes audit on a national level, for example for Holland, France.**
- **Export of biodiesel to the European market is possible** and there is demand for it, however, producers and exporters must fulfil a **number of rules:** ISCC certification, traceability, CO₂ emissions audit, company registration to the final user countries, sustainability requirements, etc.
- New technologies and developments allow **for the use of new types of feedstock** which are cheaper due to their high acidity.



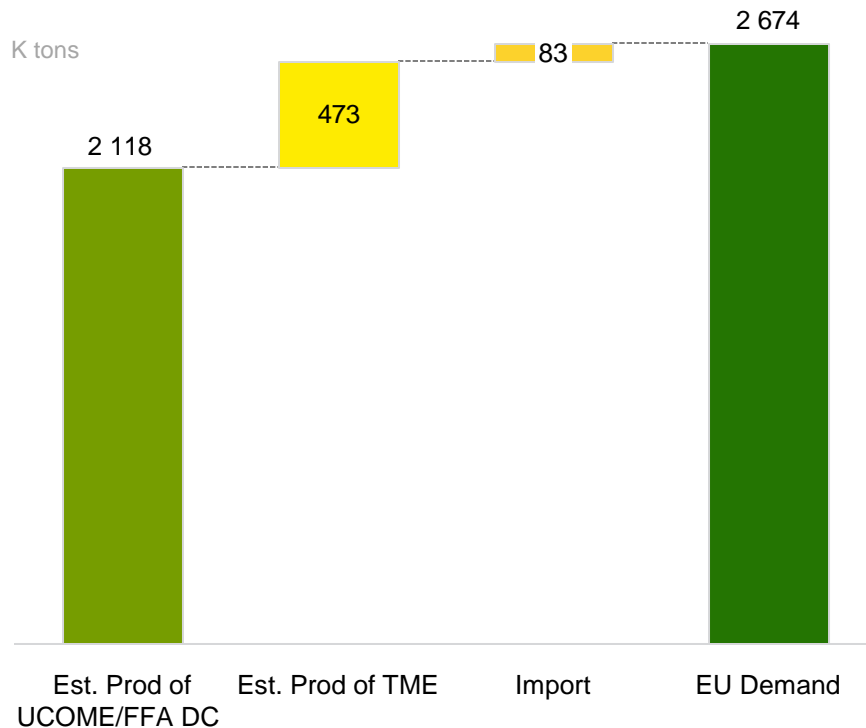
European biodiesel market is estimated at 14 million tonnes

Waste-based biodiesel production & capacity est. for 2016



In Europe, supply and demand of biodiesel remain balanced

ONLY 3% OF THE WASTE-BASED BIOFUELS IS IMPORTED

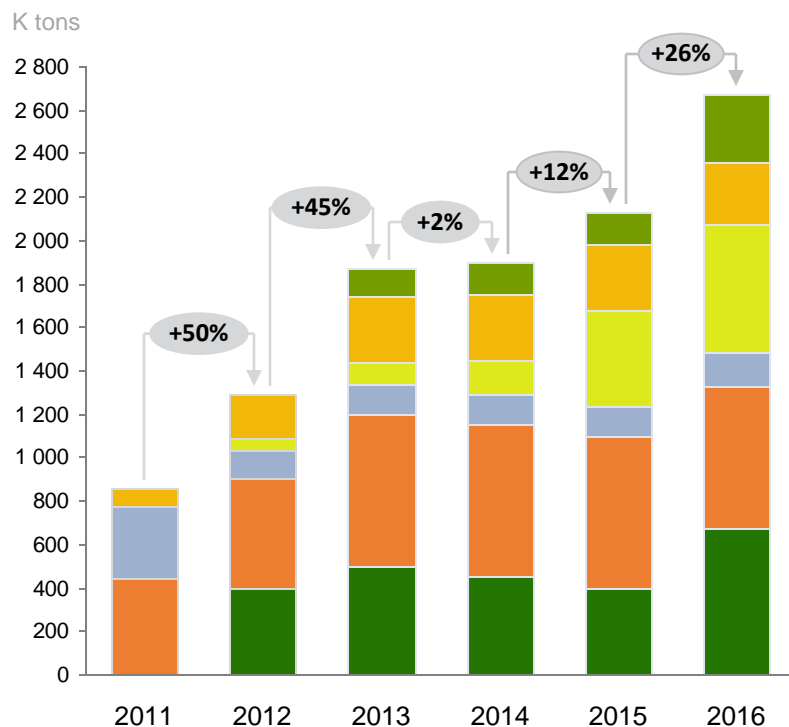


- Low demand on the European biodiesel market caused oversupply and low market liquidity.
- Low demand on the biodiesel market in Europe is partly due to a low blending rate of 5%.
- Implementation of higher blending targets could positively influence the demand. However, with the Double Counting system in place, it is predicted that many producers will switch to waste based biodiesel instead.
- Biodiesel market keeps developing in the waste-based sector. Increased investment in technology improvements, such as distillation columns or pre-treatment units, is visible all over the continent.

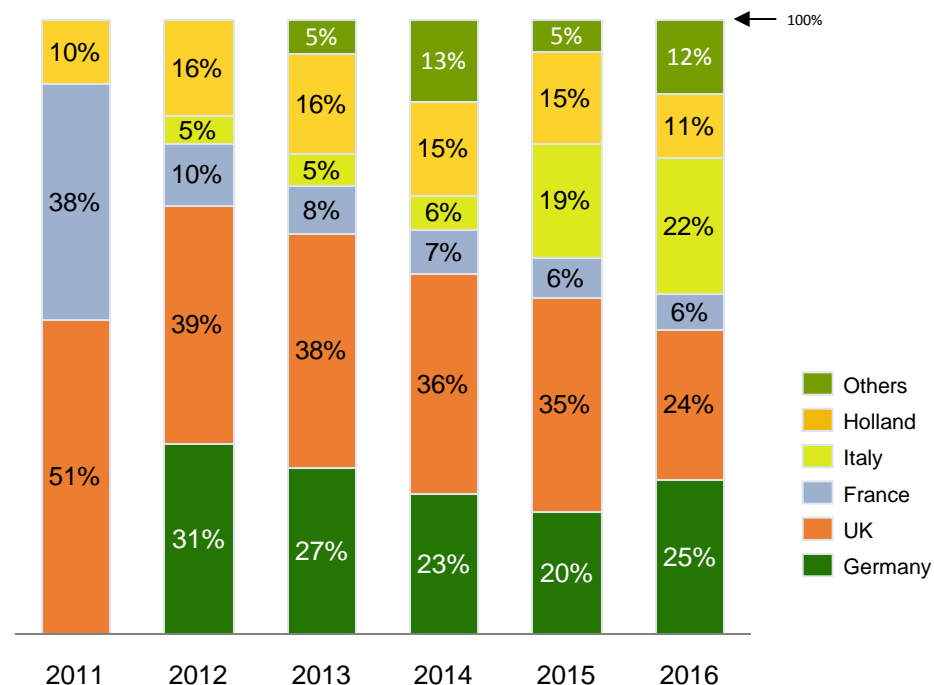
TME production in Europe will have to face feedstock supply difficulties in the coming years as the production of animal fat cat 1 is limited. Imports of UCOME will increase, especially from Asia, as we see new investments in UCOME production on the Asian market not only to export to Europe but also for their local market

UK, Germany and Italy lead the demand for double-counting products

YEARLY CONSUMPTION BY COUNTRY:
THEORETICAL DEMAND SHOULD CONTINUE TO
RISE DRIVEN BY THE ITALIAN MARKET

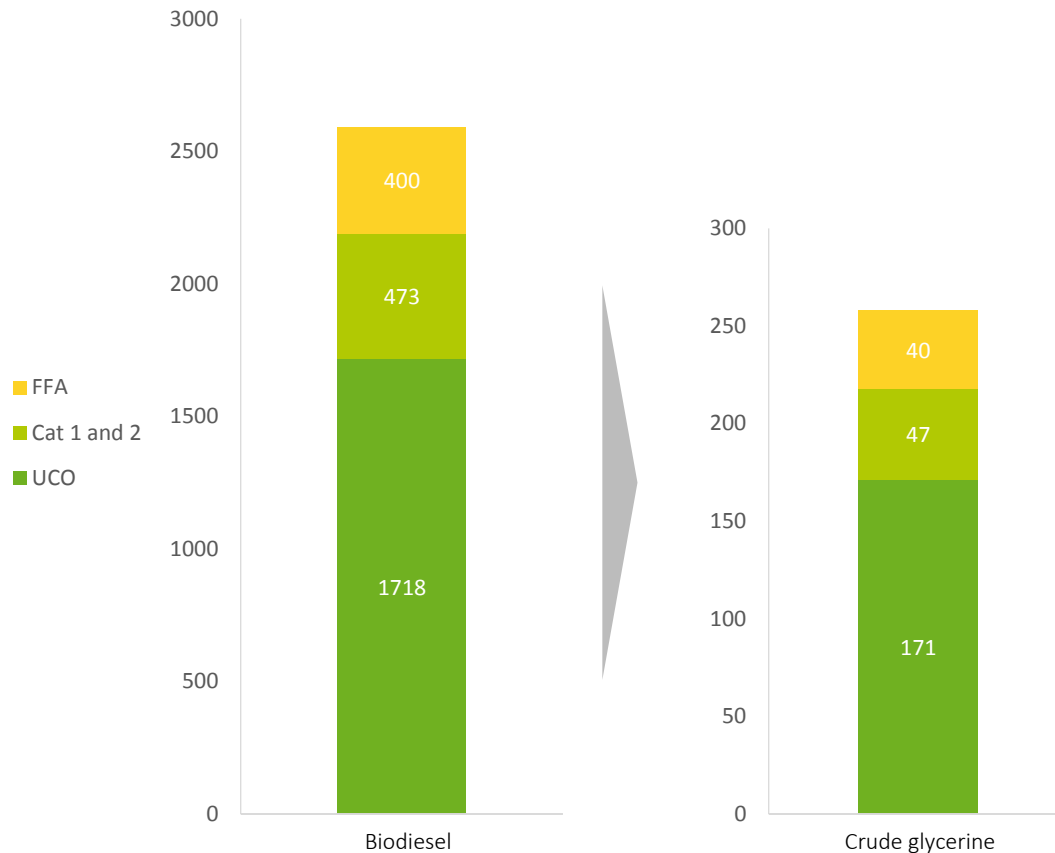


MARKET SHARE BY COUNTRY:
ITALY MORE THAN DOUBLED ITS DC CONSUMPTION
FROM 2015



In 2016 the market is driven mainly by demand coming from Italy. The country is a strong supporter of DC material, especially TME and biodiesel from Fatty Acids.

The EU waste-based glycerin market is estimated at 258,000 MT and will keep increasing



Development of the waste-based biodiesel production created a new source of glycerine in Europe. However, the quality is not uniform and may vary from batch to batch.

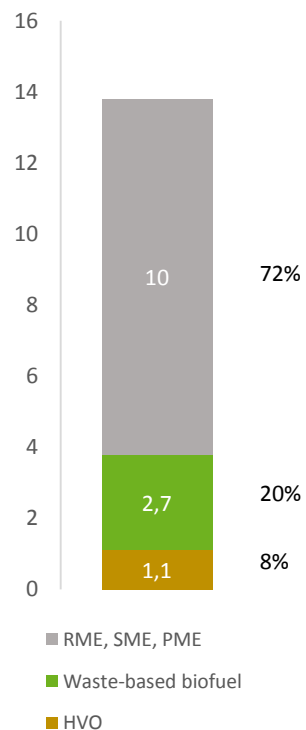
Glycerine from FFA: 19 producers

Glycerine from animal fat cat 1 & 2: 12 producers

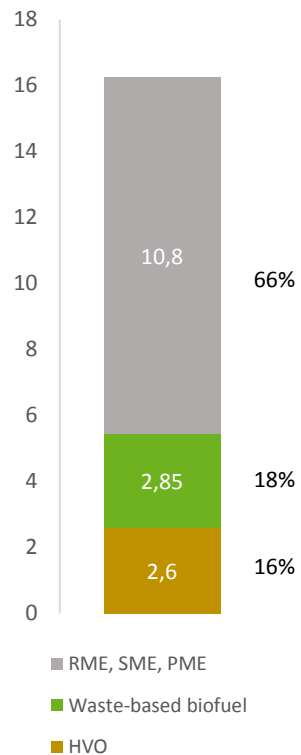
Glycerine from UCO: 25 producers

HVO development will have no impact on the glycerin production volumes

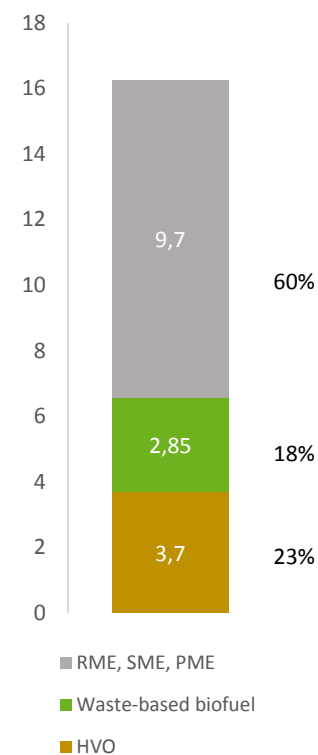
EUROPEAN BIODIESEL MARKET IN 2016



2020 REALISTIC SCENARIO:
70% OF THE HVO CAPACITY RUNNING



2020 OPTIMISTIC SCENARIO:
FULL HVO CAPACITY RUNNING

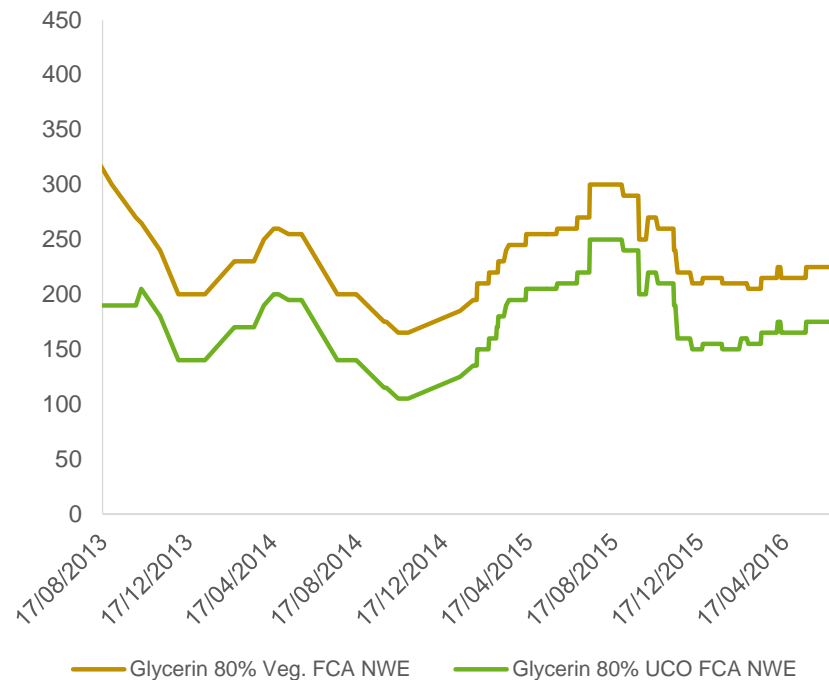


- HVO share will vary from 16% to 23% depending on the demand
- The increase in HVO share will be at the expense of first generation biofuels

Even if biodiesel production continues to increase in Europe, the growth will come predominantly from the HVO sector. This will not increase the supply of glycerine to the European market. There is a possibility for a small growth of the waste-based biodiesel market, but nothing significant as Europe is reaching its production limits.

Prices of waste-based glycerine depend on quality which varies from producer to producer

DEVELOPMENT OF CRUDE GLYCERINE PRICES IN EUROPE (indication)



- Waste based glycerine is difficult to price due to the fact that there is no standard quality and the parameters vary from producer to producer
- There are 56 producers in Europe and each of them offers glycerine with different parameters
- If even a drop of UCO is used in the biodiesel production, the high value of vegetable, kosher and non GMO glycerine is lost
- In Europe, waste-based glycerine is in demand in the biogas industry, especially in Belgium & Holland. It is also popular among refiners in Germany & Italy for technical purposes. The French biogas market is also booming with ambitious targets of 1,000 processing units for 2020.
- The spread between veg-oil & UCO glycerine with 80% glycerol content is fluctuating between 50 and 100 euros per ton depending on the demand. The quality of waste-based glycerine is variable, however, the glycerol content is mostly below 70%

Glycerine, which is a by-product of waste-based biodiesel production, does not have standard quality, however, in most cases the glycerol content is below 70%.

Opportunities and challenges for the glycerine market

“OPPORTUNITIES” FOR GLYCERINE BUYERS

- Increased production of waste-based glycerine in Europe that can be exported to Asia.
- Asia and the US also have an increased waste-based glycerine supply due to UCOME production emerging in China and constant production in Taiwan, Hong Kong and Korea.
- Waste-based glycerine producers are really open to try exporting to Asia as they are used to importing a lot of used cooking oil from overseas and Asia is their key market.

MAIN CHALLENGES FOR THE GLYCERINE MARKET

- HVO production is becoming increasingly popular and will lead the growth of the biofuels industry in the coming years. However, it implies no increase of the glycerine supply coming from the biodiesel industry in Europe.
- Moreover, the HVO development is not limited to Europe. There are several projects under development in the USA and Asia.
- The European biogas sector is booming in Europe, which could be a good output for the waste based glycerine suppliers.
- Waste-based glycerine producers are trying to improve their quality but the outcome is still far from the quality of veg-oil based product.

The veg-oil glycerine demand in Europe is anticipated to grow at 5.5% by 2022. Surging cosmetics demand in European countries such as Germany, France and England is expected to boost glycerol use as a moisturizer in skin care products.

Emerging applications as a chemical platform for renewable chemicals and biogas are expected to be critical for the development of the glycerol market over the next six years which should bring new demand for veg-oil and UCO based glycerine.

Why Greenea?

MARKET EXPERIENCE

GREENEA is an independent **brokerage** and consulting company founded in 2007. It specialises in **waste-based raw materials and biofuels**.

GREENEA offers its **services to companies using raw materials in their production as well as to various other players from the oleo-chemical, animal feed, bioenergy and biofuels markets**.

It was our conscious and strategic choice to position ourselves on the market of **raw materials that do not compete with the food sector**.



Founded in **2007**



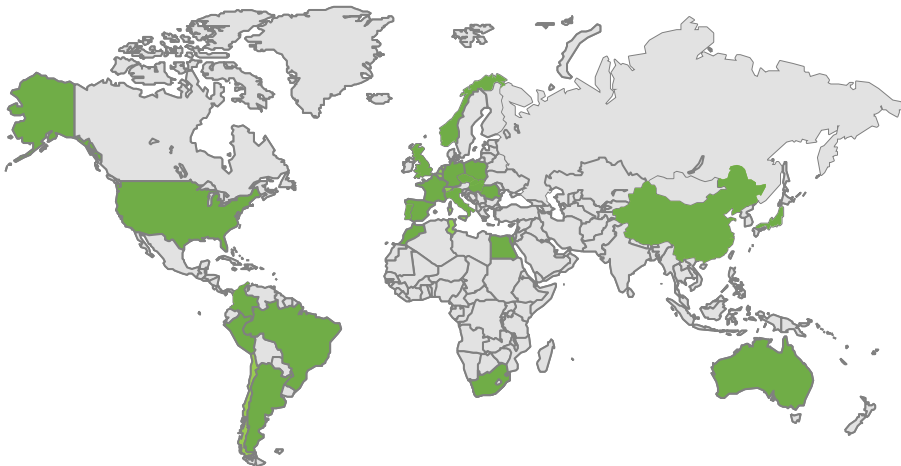
Since 2011 our average annual growth is **18%**



We speak:
English, Spanish, Portuguese, Polish, French and Italian



WIDE INTERNATIONAL PRESENCE



Our values:

honesty, integrity, respect for our clients and their values.



Securing
the supplies
for our clients

NEW ENERGY OPPORTUNITIES

Revaluating the by-products

As brokers we cover a wide variety of waste-based products as well as industrial by-products, which can be reused and transformed into, for example, biofuel or bioenergy.



EXPERIENCE

8 years of experience on the markets of used cooking oil and waste-based biofuels such as UCOME & TME

PRODUCTS GREENEA DEALS WITH

Player of circular economy



Used cooking oil



Biofuels
(UCOME, TME, FAME)



Wood pellets and
woodchips



Acid oil and glycerine



Animal fats



Crude glycerine



Our business model accelerates your success

We continuously look for new trustworthy suppliers

We can optimise our supply chain due to international sourcing

We perfectly understand the quality of every type of product and their benefits

We match buyers with sellers and carry out tailor-made monitoring of every deal

We guarantee full confidentiality



We provide everyday analysis of the market to offer transparent pricing

We can also take care of the logistics

We make sure that the deal is carried out in the most convenient and efficient way

We help our clients develop their strategy towards new markets

We aim at establishing long-term relationships with our clients



Bridge
between Asia
and Europe



TRADE DIRECTIONS TO AND FROM ASIA

Your Partner in Europe

Your Partner for
sourcing **glycerine** in
Europe

Your Partner for
selling **biodiesel, used
cooking oil, acids oils,
palm oil and POME** to
Europe





**YOUR BROKER FOR WASTE-BASED
FEEDSTOCK & BIODIESEL**

www.greenea.com



Fabien Hillairet

CEO & Biofuels Broker

+33 5 79 97 97 51

fabien.hillairet@greenea.com



Victor Allemandou

Biofuels Broker

+33 5 79 97 97 52

victor.allemandou@greenea.com



Katarzyna Gołąb

Feedstock Broker

+33 5 79 97 97 53

katarzyna.golab@greenea.com



GREENEA

5 chemin des Perrières

17330 Coivert, France



GREENEA

Rumunská 29

120 00 Prague, Czech Republic



Risk & Energy Risk
COMMODITY RANKINGS
2015
**#1 RESEARCH
IN BIOFUELS**

Member:



The information presented in this document is provided for informational and demonstrational purposes only. The data is purely indicative and gives no warranty of prices at which transactions may be affected at any time. To the maximum extent permitted by law, no responsibility or liability for the accuracy, quality, correctness or comprehensiveness of the data will be accepted by GREENEA whether arising from the negligence or otherwise. GREENEA shall in no circumstances be liable for economic loss or any indirect or consequential loss or damages arising from the use of this data.