MATELAN Research

Company Report

CropEnergies AG

- "INNOVATION FROM BIOMASS" MATERIALISES
- EXPANSION BOOSTS GROWTH AND MARGINS
- MASSIVE REVALUATION LYING AHEAD

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Company Report

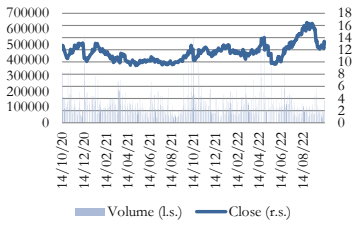
14 October 2022

Closing prices as of 13/10/22: €13.12

Company / Sector	Fair Value	Recommendation
CropEnergies AG	**€26.0**	**Strong Buy**
Renewable Energy	(€18.3)	(Neutral)

New growth phase should trigger revaluation

Share price performance



Share data	
Reuters	CE2G.DE
No. of shares	87.25
Av. turnover	78,834
Free Float	26.0%
Market Cap.	1144.7
EV	815.6
Sales 18-22	15.4%

Valuation	22/23	23/24
EV/Sales	0.5	0.6
EV/EBITDA	2.8	5.4
EV/EBIT	3.3	7.1
PER	6.2	11.8
Div. Yield	3.4%	3.4%
RoCE	43.0%	17.6%
RoE	22.0%	10.7%

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Investment case

Based on its "Innovation from Biomass" vision, CropEnergies currently embarks on a new growth phase, leading to sales of EUR1.8bn and EUR325m in EBIT, i.e. an average annual EBIT growth of 17%. A fair value for these growth prospects comes to EUR26, a 100% upside from the current share price. We thus expect a massive revaluation of the stock, triggered in particular by final investment decisions on the new projects. We thus raise our rating on the stock to Strong Buy.

"INNOVATION FROM BIOMASS" MATERIALISES

2022 has seen CropEnergies taking the first strategic steps for delivering on its new vision, enabling the company to enter complementary markets such as renewable methanol, renewable ethylene and renewable ethyl acetate. This brings new growth prospects and increases the company's flexibility to react to any changes in the market environment.

EXPANSION BOOSTS GROWTH AND MARGINS

We have raised our ethanol estimates for FY2023/24 and increased our margin assumptions for later years based on current forward prices. The expansion into new markets adds to this, leading to a sales CAGR of 9.4% and an increase in EBIT margin to 17.5%. This yields EUR1.8bn in sales and EUR325m in EBIT in 2027/28.

MASSIVE REVALUATION LYING AHEAD

Pricing these estimates into our DCF model returns a fair value of EUR26 with still room for more. A comparison of multiples confirms this outcome. We expect the market to reflect CropEnergies' growth prospects driven by final investment decisions, which should lead to a revaluation of around 100%.

For additional disclosures please refer to the appendix

Forecasts	19/20	20/21	21/22	22/23e	23/24e
Sales (€m)	899.2	833.1	1075.3	1574.7	1597.1
EBITDA (€m)	146.3	149.3	168.8	288.4	174.5
EBIT (€m)	104.1	107.9	127.0	246.4	132.7
EPS (€)	0.85	0.97	1.02	2.12	1.11
Dividend (€)	0.30	0.35	0.45	0.45	0.45
Oper. CF (€m)	125.1	105.9	147.0	189.0	137.5
Free CF (€m)	95.2	77.0	111.2	159.0	-81.5

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EXECUTIVE SUMMARY

Leading European ethanol producer …

Over the past twenty years, CropEnergies has expanded throughout Europe, currently operating four sites in four European countries to become the largest European ethanol producer. Based on a capacity of 1.29m m^3 bioethanol, 1m tonnes of food and animal feed, and 415.000 tonnes of CO_2 the company has reached more than EUR1bn in sales in the past financial year.

… embarking on a new growth path

Since becoming CEO in July 2020, Dr. Stephan Meeder formulated the company's new strategic vision "Innovation from biomass", aimed at growing into new markets around the traditional production of ethanol from renewable resources. The current year has now marked the start of the new expansion period. In January, the company announced that it is evaluating the construction of a 50,000 t renewable ethyl acetate production, and in May the company took a stake in LPX, a company with a process to generate second generation ethanol from biomass. Most recently, CropEnergies bought a participation in East Energy, a company with rights to build 1GW of solar capacity from which e-methanol can be produced, and a share in Syclus, a company aiming at the construction of a renewable ethylene production of 100,000 tonnes in the Netherlands. All these moves have a high strategic fit with CropEnergies' current activities, extending the company's value chain and broadening the product offering. However, it is in particular the massively increased flexibility to react on changing developments in individual markets that we value most. So far, only small investments have been made to secure the know-how. However, we would expect to see the first expansion investment decision to be made already in 2022.

EU tightens CO_2 regulation to remain at the forefront of climate protection

In its traditional activities, CropEnergies continues to benefit from the EU's target to become the first climate neutral continent by 2050. As part of the European "Green Deal", the European Commission proposed to reduce greenhouse gas emission by 55% until 2030 compared to the 1990 level. For the transport sector, the resulting proposal for amendment of RED II, which is also likely to be approved this year, specifies a GHG reduction target of 13% until 2030. This is a doubling of the previous target. For second generation biofuels, a separate share of 2.2% is proposed, with all double counting eliminated. Each member state must translate the new regulation into national law. Germany, for example, has already introduced a 25% GHG reduction target for the transport sector but still allows for multiple counting. With regard to electric vehicles, the country has defined a target trajectory which currently ensures that traditional biofuels will not be driven out by e-mobility. All in all, the tightening regulation for the transport sector should trigger further market growth and keep prices at elevated levels.

Ethanol market could grow by 50% until 2030

The European ethanol market has been growing at an average annual rate of 3% since 2015. The market has meanwhile outgrown local capacities so that a significant part of demand has to be covered by imports. We now expect growth to accelerate, driven by a moderate increase in the car fleet, the current shift in fuel types, and an increasing use of E10. In fact, we expect European fuel ethanol volumes in 2030 to exceed the 2020 level by 50%. European ethanol prices have been boosted by increasing demand, tight capacities and high prices for fossil fuels. We currently see them settling around EUR1000/m³ with feedstock prices gradually moving back to around EUR300/tonne.

New markets offer strong growth prospects

With regard to the new ventures, global demand for methanol grows at a rate of 4.5%. By 2050, the market is expected to be five times as large as in 2020 with the increase entirely covered by renewable methanol. Within the fuel segment, stricter EU regulation, in particular the inclusion of the maritime sector into the ETS and target quotas for sustainable aviation fuels, is a major driver. While global demand for ethylene has been rather stable over the past years, bio-based polymers grow at an average annual growth rate of 22%, though from a small level. The market for ethyl acetate grows around 6% p.a. with Food & Beverages accounting for the largest market share and Pharma as well as Packaging being the main drivers of growth. Supply of renewable products is scarce in all of these new markets so that customers are currently trying to team up with potential producers. Pricing for renewable products should thus move to a level that attracts the necessary investments.

Average annual growth of 9.4% and a 17.5% margin should leave CropEnergies with EUR1.8bn in sales and EUR325m in EBIT in FY 2027/28

Based on CropEnergies' communicated plans and the described market developments we have modelled the potential financial impact on the company. In ethanol, we have slightly raised our expectations for FY2022/23 and FY2023/24 as well as our medium-term margin assumptions based on the improved outlook suggested by forward prices. We expect renewable methanol to reach EUR130m in sales and an EBIT of EUR59m by FY 2027/28. Renewable ethylene could reach EUR257m in sales and EUR27m in EBIT and renewable ethyl acetate should come to EUR91m and EUR10m, respectively. Assuming internal sourcing, this yields an average annual growth rate of 9.4% based on last reported sales. Moreover, the group's EBIT margin should be driven to 17.5%. We would thus expect CropEnergies to achieve EUR1.8bn in sales and EUR325m in EBIT in 2027/28.

Growth prospect should be valued at EUR26 per share

Valuing these prospects on the base of a DCF model we arrive at a fair value of EUR26. This is a material increase from our previous valuation of EUR18.3, coming partly from the improved outlook for the company's ethanol activities but also the anticipated transformation of the company, which drives growth and margins. External sourcing and in particular a second investment phase still leave room for more. Even more importantly, it the company's various options to rescale one or the other project depending on market developments that makes us confident that the company can meet our estimates. Cross referencing our DCF calculation with a comparison of multiples shows that despite similar earnings growth prospects, CropEnergies currently trades at a massive discount to its closest peer. Based on our fair value of EUR26, valuation multiples almost converge. We would thus see CropEnergies ripe for a massive revaluation.

COMPANY PROFILE AND STRATEGY

Largest European ethanol producer

CropEnergies is the largest European ethanol producer. The company produces its ethanol from renewable resources and sells the predominant part of its ethanol production as fuel to the mineral oil industry which is obliged to add ethanol to fossil-based petrol in order to meet the CO_2 reduction obligations set for the transport sector.

Company has been expanding over the past 20 years throughout Europe

The company's origins date back to 2003 when Südzucker AG founded the Südzucker Bioethanol GmbH and started developing Europe's largest ethanol plant at the time in Zeitz, Germany. In 2006, the company renamed to CropEnergies AG and went public. Only two years later the company started production at its new plant in Wanze, Belgium and acquired Ryssen Alcools SAS in France. In 2013, CropEnergies acquired Ensus UK Ltd. Over the years, CropEnergies has thus steadily expanded its scope, in terms of size as well as in terms of regions. With four sites in four different European countries, the company has thus become a truly European player.

1.29m m^3 of ethanol, more than 1m tonnes of animal feed, and 415.000 tonnes of CO_2

The following chart illustrates CropEnergies' different facilities throughout Europe. In total, the company comes to 1.29m m^3 in ethanol production capacity, of which 150.000 m^3 are processed to neutral alcohol. 10% of the ethanol production comes from waste materials and thus classifies as advanced biofuel. In addition, the company produces more than 1m tonnes of animal feed either in dried or in liquid form, 60.000 tonnes of Gluten for high protein food and 165.000 tonnes of liquefied as well as 250.000 tonnes of biogenic CO_2.

CropEnergies' production sites at a glance

	Feedstock	Ethanol	By-Products
Zeitz (Germany)	Grain Sugar Syrup Residues	400.000m^3	300.000t ProtiGrain 100.000t liquefied CO_2
Wanze (Belgium)	Wheat Sugar Syrup	300.000m^3	60.000t Gluten 400.000t ProtiWanze 65.000t liquefied CO_2
Loon-Plage (France)	Raw Alcohol Residues	190.000m^3	
Wilton (UK)	Grain	400.000m^3	350.000t DDGS

Source: Matelan Research based on CropEnergies data

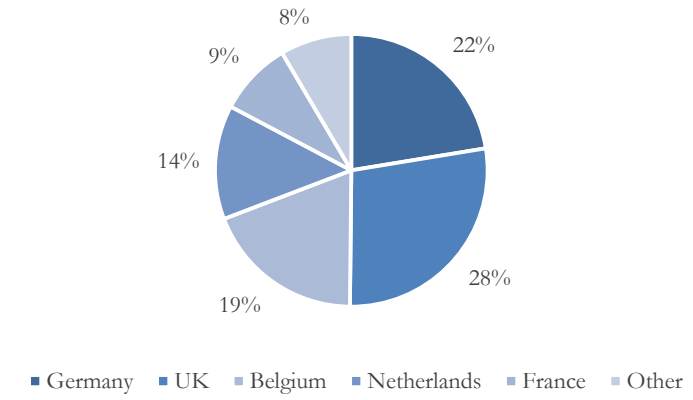
Local sourcing and …

Production sites are located close to the raw materials used and offer good means to transport the final goods. Most of the sites are built close to a river and/or have a rail connection. Sourcing is usually performed via traders or co-operations that market local wheat or corn. The company tends to source its products not further away than 250km. One exemption is the site in the UK which has to import the corn that it adds to the locally sourced wheat.

… flexible marketing throughout Europe…

Marketing for the predominant part of fuel ethanol is performed centrally at CropEnergies AG. This gives the company a great flexibility with regard to making the best use of its products in view of the different national regulations across Europe. In contrast to many other countries, Germany has a system that is based on GHG reductions and customers are keen on products with high GHG reductions. As for example CropEnergies' production in Wanze benefits from a biomass generator which gives the product an additional GHG reduction, a lot of the ethanol from Wanze is sold to German customers. Still, most of the company's ethanol production goes to refineries nearby or are shipped via major ports, in particular Rotterdam. Looking at the distribution of the company's sales by country, we find that Germany, the UK, France, Belgium, the Netherlands, and France account for more than 90% with a rather even distribution. Other countries account for a total of 8%, but no individual other country exceeds 0.5% of the group's total.

Share of sales by country



Source: Matelan Research based on CropEnergies data, FY 2021/22

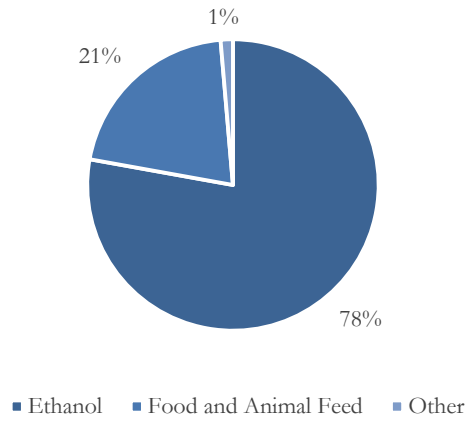
… to a diversified customer base

In general, CropEnergies deals with the oil majors directly. The company is not selling most of a site's production to a single refinery but serves almost all oil majors. No customer accounts for more than 10% of the company's sales. Quite importantly, the company is no longer serving Rosneft.

Sales of more than EUR1bn in FY 2021/22

Over the past financial year, CropEnergies has realised sales of more than EUR1bn. The predominant part, i.e. 78%, comes from the sale of ethanol and neutral alcohol. However, apart from being the market leader in the European ethanol market, CropEnergies has given evidence that it can also act successfully in unregulated markets. This not only refers to serving the food and animal feed industries but also beverages and chemical applications. Including CO_2 and neutral alcohol we estimate that unregulated markets accounted for more than 30% of sales in the past financial year.

Share of sales by product



Source: Matelan Research based on CropEnergies data, FY 2021/22

New management with a new vision

Over the past three years, the management board of CropEnergies has been passed on to a new generation. Dr. Fritz Georg von Graevenitz became CSO in October 2019, Jürgen Böttcher joined the board in Mai 2020 as CTO, and in July 2020 Dr. Stephan Meeder assumed the position as CEO in addition to his responsibilities as CFO. Most importantly, Dr. Meeder formulated a new strategic vision for the company in 2021 under the slogan "Innovation from Biomass". This means in particular that the company continues to bank on its traditional business of sustainable and climate friendly fuels including the CO_2 activities as well as the protein products for the food and animal feed markets. However, the vision also specifies the company's ambition to enter new markets. In particular, management intends to develop renewable chemicals such as ethylene as an alternative to fossil-based products. In addition, it wants to participate in the growing market for green electricity and green hydrogen. We are thus looking at a new growth phase.

Taking stakes in ethyl acetate, …

A first move to deliver on this strategy was undertaken this January when the company entered into an engineering, licencing and technical service agreement with Johnson Matthey for the development of a 50.000t ethyl acetate facility close to CropEnergies' location in Zeitz. The ethyl acetate shall be produced from renewable ethanol. As a by-product, hydrogen will be generated, which combined with the company's liquefied CO_2 can be converted to e-fuels. A final investment decision amounting to EUR80-100m will be taken in late 2022, following the results of the basic engineering phase.

… cellulosic ethanol, …

At the end of May, CropEnergies took an almost 20% stake in LPX Group for EUR2m. LPX has patented a process for the mild digestion of cellulosic biomass such as straw or wood residues which can then be converted into second generation ethanol. In contrast to other cellulosic ethanol processes, LPX does not use a highly energy and investment intensive treatment with pressure but a mild digestion. The resulting outcome can then be used as a feedstock in CropEnergies' existing ethanol plants. LPX plans to build a pilot plant using 15.000 tonnes of biomass in 2022/2023. Depending on the outcome of the product and the production costs, the project could be scaled and integrated into CropEnergies' processes.

… green methanol, …

In September, the company took a strategic stake in East Energy, a German solar park developer that intends to build and operate 1GW of ground mounted photovoltaic capacity until 2024. So far, CropEnergies has invested EUR8m for 25% of the company's equity, loans and cash. Building the targeted capacity will require investment of at least EUR600m and CropEnergies is likely to become a majority stakeholder in East Energy during this process. In a second step, CropEnergies intends to produce green methanol from the solar electricity combined with its liquified CO_2. Green methanol can be sold as an e-fuel in particular to the shipping but also in modified form to the aviation industry.

… and renewable ethylene …

Only a few days later, CropEnergies announced a EUR1.8m investment for a 50% stake in Dutch biobased chemicals start-up Syclus BV. Syclus intends to build a 100.000 t production of renewable ethylene in the Netherlands, using ethanol as a raw material. Basic engineering is expected to be finished in 2023 and based on a successful outcome, construction could be finalised in 2026. Investments for the plant should range from EUR85m to EUR100m.

… has secured know-how in complementary growth markets

So far, all steps are in an early stage but all could make a material impact on the company's future development. With investments of just EUR12m, CropEnergies has secured access to a number of core technologies that will allow the company to serve the growing demand for innovative renewable products as an alternative to their fossil-based counterparts. Moreover, the moves ideally complement the company`s existing business.

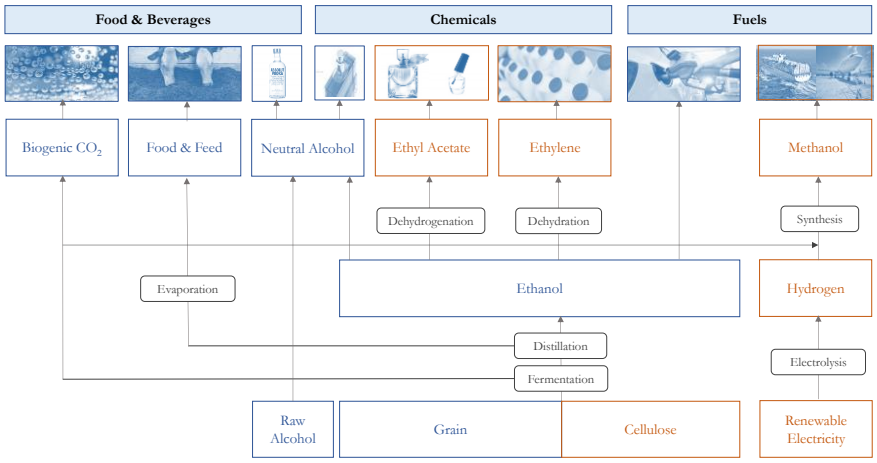
Extending the value chain …

Ethylene and also ethyl acetate are pieces of a puzzle that fit perfectly with the existing ones. Here, the company can make use of its ethanol to produce chemical products used in a wide variety of applications such as plastics. The company thereby extends its existing value chain and increases its flexibility with regard to distribution channels for its ethanol production. Depending on the market development for fuel ethanol, CropEnergies can either shift its own production into the ethylene and ethyl acetate processes or can source additional ethanol externally. The company has thus the option to continue serving a rising demand for fuel ethanol in Europe with its own production and source the feedstock for its renewable chemical production externally but the company is safeguarded should politicians decide to restrict the use of crop-based biofuels further. Flexibility could even be further increased by complementing the existing grain feedstock with scaling up the production of ethanol from cellulosic materials such as straw or wood residues.

… and broadening the product offering

Ethylene and ethyl acetate are chemical products, an area that the company already addresses with its neutral alcohol, which is for example used in cosmetics. The company thus broadens its product offering to the chemical industry. Equally, the production of methanol complements CropEnergies' offering in the area of renewable fuels. While ethanol is a fuel serving the passenger car market, methanol can be used in shipping and aviation, an area where renewable products are not yet established. Here, CropEnergies could participate in the electrification of the transport sector but the company remains highly flexible on this side as it can also sell the renewable electricity directly or sell hydrogen, which is likely to become the energy source of the future.

Overview of products and processes



Source: Matelan Research, new activities marked in orange

Ethyl Acetate, Ethylene and Methanol production could transform the company

While the cellulosic ethanol process might not yet be at a stage where it can reduce the company's ethanol production cost materially, we believe that the ethyl acetate, methanol and ethylene projects have the potential to transform the company. A ramp-up of these activities would leave a material effect on the company's financials and we would expect them to become separate reporting segments.

Great flexibility with regard to delivering on planned growth

We also value CropEnergies' prudent approach with regard to its planned expansion. While so far, the company has spent only a small amount of money to secure the technology, the decision to realize the projects will only be taken after a successful basic engineering phase. Moreover, with the four different routes that the company pursues, it has plenty of options to modify its plans. If market conditions for one or another project became less favourable, the company has the option to scale a project stronger that exceeds expectations. And a concept that works on one site can rather easily be copied on other sites. There is thus a great flexibility with regard to delivering on the currently planned expansion and there is plenty of room for a second expansion phase.

Major shareholder backs the expansion

CropEnergies' growth strategy is discussed and backed by the major shareholder, Südzucker, which still controls 74% of the equity. For Südzucker, CropEnergies is currently not only a major earnings contributor, CropEnergies' expansion into biobased chemicals has even become one of Südzucker's focus initiatives in its 2026 strategy. The projects have thus so far convinced even this second control layer and the final investment decision on the first project which is scheduled for the end of this year will give evidence of Südzucker's commitment to CropEnergies' expansion plans.

THE REGULATORY BACKGROUND

Biofuels are governed by a complex set of regulation

While CropEnergies has been addressing a number of unregulated markets for some time, the predominant part of the company's sales is presently generated from selling ethanol as a biofuel to mineral oil companies, which are obliged to purchase such fuels in order to meet their obligation to reduce CO_2 emission. This system is governed by a rather complex set of laws. The following section provides an overview of the most relevant specifications for the development of the market and the political aims behind these laws.

THE EU SETS THE FRAMEWORK

EU aims at becoming the first climate-neutral continent by 2050

Against the background of the finite nature of fossil resources and in an attempt to counter climate change, many countries have committed themselves to reduce CO_2 emissions as laid out in particular in the Kyoto Protocol and the Paris Agreement. The EU has been aiming to be at the forefront of this development and intends to become the first climate-neutral continent by 2050.

20/20/20 by 2020

A major milestone had been set with the "2020 climate and energy package" which was enacted in 2009. The headline targets to be achieved by 2020 were to reduce greenhouse gas emissions by 20% from the 1990 level, to reach a 20% share of renewables in EU energy consumption, and to improve energy efficiency by 20%.

"Fit for 55" by 2030

As a follow-up covering the period 2021 to 2030, the "2030 climate & energy framework", specifies a 40% reduction of GHG emissions from the 1990 level, a 32% share of renewable energies and a 32.5% increase in energy efficiency. However, as part of the European Green Deal, the European Commission proposed in September 2020 to raise the GHG reduction target to 55% by 2030.

ETS and …

As a key tool for cutting CO_2 emissions, the EU introduced an Emission Trading System (ETS) for heavy emitting sectors such as power, industry and aviation. The system covered 36% of the EU's CO_2 emissions in 2020. The target is to reduce emissions in these sectors by 43% in 2030 compared to 2005. In fact, this target was already achieved in 2020, though with the help of the pandemic. "Fit for 55" now specifies a 61% reduction target for 2030 and an inclusion of maritime transport in the ETS.

… national targets drive CO_2 emission reductions

For the remaining sectors such as housing, agriculture, waste and transport (excluding aviation), covering 64% of the EU's CO_2 emissions in 2020, the member states had taken on national emission reduction targets, which collectively aim at delivering a 10% reduction compared to the 2005 level by

2020 (Effort Sharing Decision). Together with the reduction from the ETS, this adds up to a decline of 20% compared to the overall CO_2 emission level of 1990. By 2030, non-ETS sectors must contribute a 30% reduction compared to the 2005 level (Effort Sharing Regulation), which is consistent with the 40% overall reduction target including the ETS. This 30% target for the non-ETS sectors is moving up to 40% under the "Fit for 55" scheme.

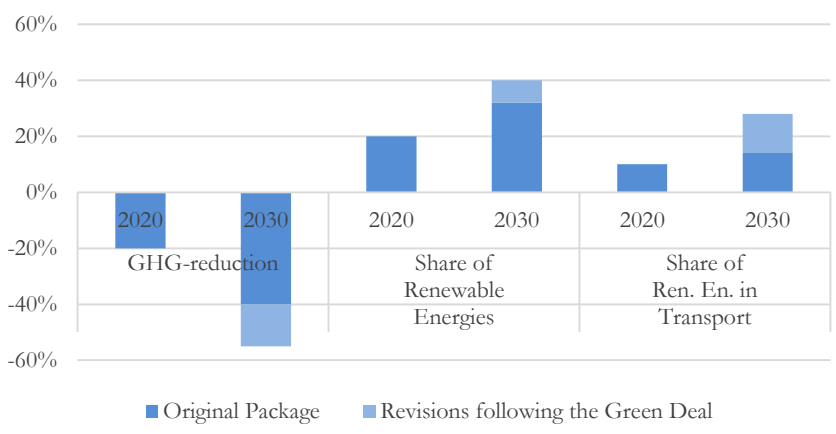
RED demands expansion of renewable energies

Renewable energies were addressed by the Renewable Energy Directive (2009/28/EC), which required a 20% share of gross final energy consumption in the EU to come from renewable sources in 2020. All member states had committed themselves to binding targets, which were laid out in National Renewable Energy Action Plans (NREAPs). The revised directive (REDII - 2018/2001/EU) covers the period from 2021 to 2030 and requires an increase in the overall share of renewables to 32% over the period. In order to remain consistent with the increased "Fit for 55" targets, RED II is currently under review. A proposal for amendment of the directive published by European Commission in July 2021 (2021/0218 COD) specifies an increase of the 2030 target to 40%. The amendment is planned to be approved in Autumn 2022.

Specific targets for the transport sector

In view of the importance of the transport sector, the EU had set a specific target for the share of renewable energies within this subsector. Whereas member states were free to choose their respective mix of renewable energies within their NREAPs, the share of renewable energies in the transport sector, i.e. fuels from renewable sources, was set to 10% in 2020 for each member state. RED II now demands an increase to 14% by 2030. In its proposal for an amendment to RED II the European Commission switches to a GHG reduction target of 13% until 2030 compared to a new emission-based benchmark. This is equivalent to a 28% share according to the old system, i.e. a doubling of the target. The European Parliament, which still has to give its consent to the amendments even advocates at GHG reduction target of 16% instead of the 13%. In any case, the new target replaces the 6% GHG reduction target for the transport sector which has so far been stipulated in the Fuel Quality Directive.

Further tightening of EU climate targets



Source: Matelan Research based on EU data, share of renewable in the transport sector in 2030 recalculated to original system. The actual target is now a 13% GHG reduction

Advanced biofuels required to expand

In view of the argument that rising demand for biofuels could have negative effects on the production of food and feed crops and could lead to the conversion of forests and wetland (Indirect Land Use Change), the use of crop based biofuels has been capped to 7% of the energy used in the transport sector. This cap moves to 2020 consumption plus 1% with a maximum of 7% for the period up to 2030. Moreover, high-risk ILUC fuels such as palm oil will be phased out between 2021 and 2030. In contrast, RED II requires an increase in advanced biofuels according to Annex IX A, by setting minimum levels of 0.2% in 2022, 1.0% in 2025 and 3.5% in 2030 (including multiple counting) while biofuels according to Annex IX B, in particular used cooking oil, shall be capped to 1.7%. The amendment to RED II now suggests 0.2% in 2022, 0.5% in 2025 and 2.2% in 2030, all single counting. Biofuels of non-biological origin must reach a share of 2.6% in 2030.

Level playing field for domestic producers

In order to ensure a level playing field for domestic producers of biofuels, the EU has enacted anti-dumping duties on the import of biofuels from a number of countries. This relates in particular to bioethanol from the US and Brazil and biodiesel from Argentina and Indonesia. The stipulation of sustainability criteria for biofuels has also helped on this side. While imports are increasingly needed, regulation safeguards that competition from overseas will not get out of hand, though temporary imbalances are always possible.

TRANSLATION INTO NATIONAL LAW

Germany addresses transport sector with GHG reduction quota

Each member state has to translate the above-described EU regulation into national law. Here, every nation has the flexibility to use different measures to reach the given targets. With regard to the transport sector, Germany has switched to a system focusing on greenhouse gas reductions (Treibhausgasminderungsquote) already in 2015. This reduction can be realised e.g. by selling biofuels, which have lower CO_2 emissions compared to the product they replace. This is performed predominantly in the form of blending biofuels with traditional fuels.

Set of regulation ensures conformity with EU targets

Against this background, the German government introduced a set of regulation, encompassing the "Bundesimmissionsschutzgesetz" (BImSCHG), specifying the minimum reduction in CO_2 emissions of fuel-selling companies, the "Bundesimmisionsschutzverordung" (BImSCHV), detailing the cap on crop-based biofuels and a rising minimum share of advanced biofuels. In addition, the "Biokraftstoffnachhaltigkeitsverordnung" (BioKraft-NachV) covers the sustainability criteria. Further important regulation includes several DIN norms, which specify the standards for biofuels and the current blended fuel standards (B7 and E5/E10).

GHG reduction of 40-42% until 2030 targeted

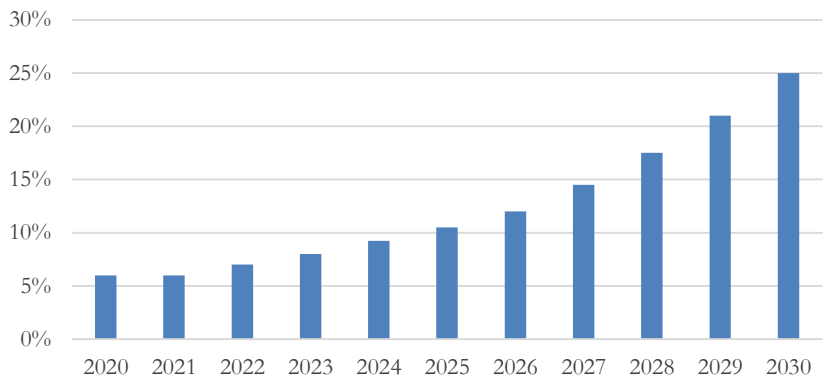
In 2016, the German government adopted the Climate Action Plan 2050, which is the country's commitment to the Paris Agreement. The country's aim is to become extensively climate neutral by 2050. As a medium-term target, Germany wants to reduce greenhouse gas emissions by 55% until 2030 compared to the 1990 level. This target has been broken down by sector. For the transport sector, a reduction of 40-42% compared to the 1990 level has

been declared. This is quite an important contribution as in contrast to most other sectors, CO_2 emissions in the transport sector have not been reduced materially up to 2020. The entire reduction must thus be realised within the period 2020-2030.

Germany demands GHG reduction from fuels of 25% by 2030

Against this background, the German government has amended the law regarding the Greenhouse Gas Reduction Quota (Treibhausgasminderungs-Quote) in March 2021. In particular, the German Greenhouse Gas Reduction Quota shall now rise from 6% in 2020 to 25% in 2030, which is an enormous step. It appears that regulation in Germany has already accounted for a major part of the proposed amendments to RED II on EU level.

Required GHG Reduction from fuels in Germany

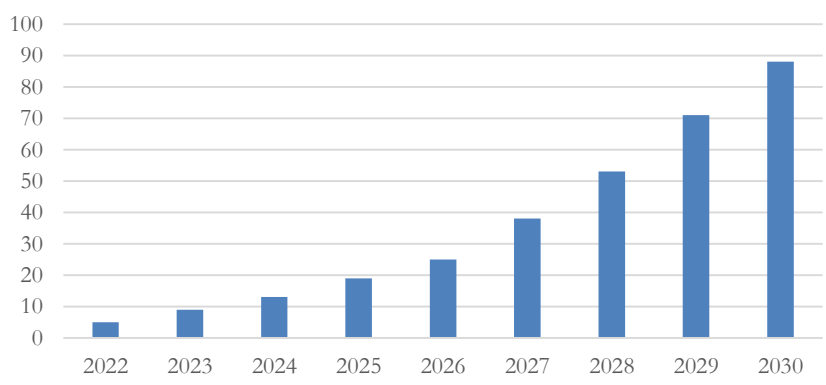


Source: Deutscher Bundestag, reduction compared to reference value of fossil fuels of 94.1 kg CO_{2eq}/GJ

Stable 1G biofuels - 2G is the growth part of the market

This increase is somewhat back-end loaded but a slight gradual increase is already foreseen for the coming years. The share of crop-based biofuels is capped at 4.4% in terms of calorific value. The share of advanced biofuels shall rise from 0.5% in 2020 to 2.6% in 2030. The development of synthetic fuels and renewable electricity is promoted by multiple counting. However, in particular with regard to the electrification of cars, it is important that a target trajectory has been defined and if electric vehicles would deliver more than their target, the overall GHG reduction target would be increased by this amount. This ensures that a quicker adoption of electric cars would not come at the expense of biofuels

Targeted trajectory for electric vehicles in Germany



Source: BMU, in PJ

Industry tailwind in Germany cannot be taken for granted

It should, however, be noted that with the Russian attack on the Ukraine, the German Green Party, which is currently in charge of the ministry for environmental affairs, has opened up the debate about crops being used rather for food than for fuel and announced that they would work on an amendment of the law that aims at lowering the cap for 1G biofuels and phasing them out until 2030. Since the announcement, we have seen an easing of the wheat supply and strong opposition from coalition partner FDP, which is responsible for the ministry for transport. We have thus seen no follow-up so far, but a further attempt from the Greens to act on this side cannot be fully excluded.

Regulation has been creating strong demand for ethanol in Belgium, …

With regard, to regulation in other key markets for CropEnergies, we see ethanol enjoying strong support. In Belgium, E10 became the standard petrol fuel in 2017 with the introduction of an 8.5% (calorific) target for bioethanol. This has triggered significant market growth in the country. Since January 2021, Belgium demands a 10.2% share of biofuels with minimum levels of 6.6% for bioethanol and 6.5% for biodiesel.

… France, …

France requires a share of 8.6% for bioethanol and 8.0% for biodiesel. From 2023 on, a separate quota for advanced biofuels is demanded, which amounts to 1.2% for bioethanol and 0.4% for biodiesel. These values rise to 3.8% and 2.8%, respectively, in 2028. So here as well, advanced biofuels will become the major driver of growth. Quite interestingly, besides a strong share of E10, France has developed a sizable market for E85, reaching 7% in June/July 2022. Used as primary fuel for Plug-In Hybrids, E85 could even serve up to 5m cars by 2040., i.e. 15-20% of the cars on French roads with a similar CO_2 reduction compared to battery electric vehicles.

… the Netherlands, …

The Netherlands has an overall biofuel target of 16.5% in 2022, with advanced biofuels coming to 1.7% and a cap on crop-based biofuels of 1.2%. The overall target rises gradually to 19.8%, the advanced target to 3.5% by 2025

… and the UK

The UK currently requires a share of renewable fuel (main obligation) of 12.599% in 2022. The country's trajectory for renewable transport fuel obligations (RTFO) increases gradually on a yearly basis up to 17.676% in 2032. In addition, development fuels shall rise from 0.908% in 2022 to 3.390% in 2032. The country's crop cap is 3.67% in 2022, decreasing year-on-year to 2% by 2032. E10 was introduced in September 2021 and has become the de facto standard since.

MARKET DEVELOPMENTS

ETHANOL

Legislation drives the ethanol market

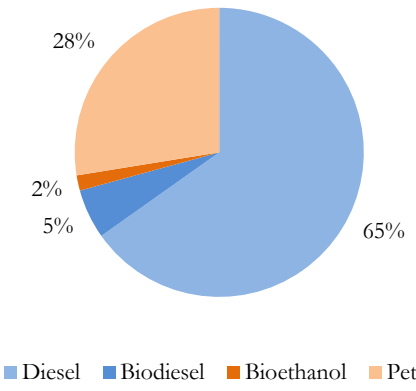
The legislative framework laid out in the previous section of this report, in particular the transport sector's increasing obligation to reduce CO_2 emissions, has been creating sizable demand for biofuels within the European Union. The following section is aimed at looking into the structure of this market and to provide an outlook for the future.

MARKET STRUCTURE

Biofuels account for 7% of European fuel consumption

Fuel consumption in the EU amounted to almost 320bn litres in 2021, with diesel accounting for roughly two thirds and petrol covering the remaining third. The share of biofuels came to 7%. The blend rate of biodiesel in the diesel market was 7.8%, bioethanol reached 5.9% of the petrol market.

Distribution of European fuel consumption in 2021

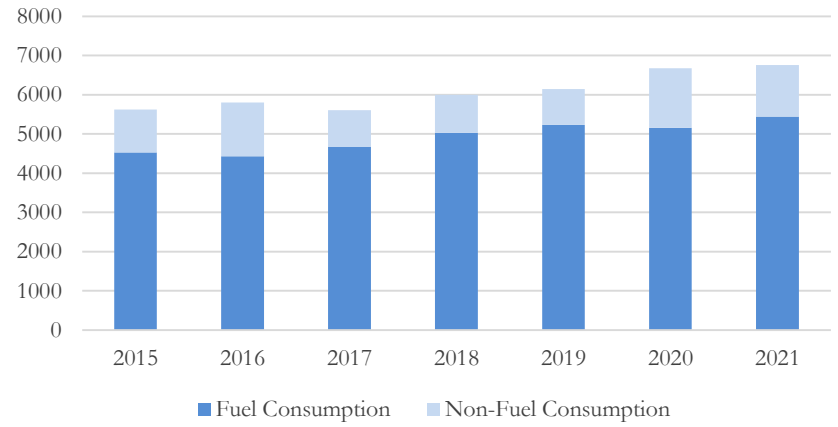


Source: Matelan Research based on EU FAS posts estimates, in million litres, diesel includes road transport as well as construction & agriculture

EU fuel ethanol market grows 3% p.a.

The EU fuel ethanol market amounted to around 5.4bn litres in 2021. An additional 1.3bn litres of ethanol was used for other applications. Over the period from 2015 to 2021 the average annual growth rate in both segments came to 3.1%.

Development of EU ethanol consumption

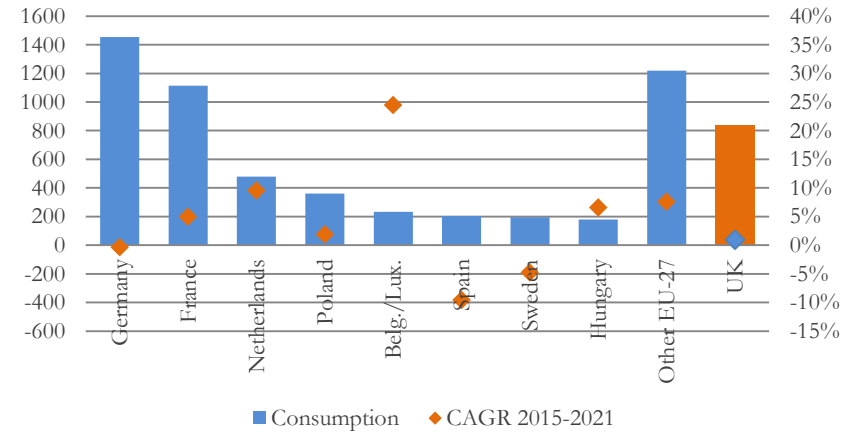


Source: Matelan Research based on EU FAS posts data, in million litres

Germany and France are the largest markets

With a share of 27% and 20%, respectively, Germany and France are clearly the largest ethanol markets in Europe. While the German market has been stagnating over the past years, France has shown an average annual growth rate of 5% over the period 2015-2021 and growth is expected to accelerate to 10% in 2022. Belgium shows the highest growth rate as a result of the quick adoption of E10, which was introduced in 2017. The UK, which is no longer part of the EU, added around 800m litres in 2021, growing at a rate of 0.9% from 2015 to 2021. This makes the UK the third largest market in Europe.

European fuel ethanol consumption by country

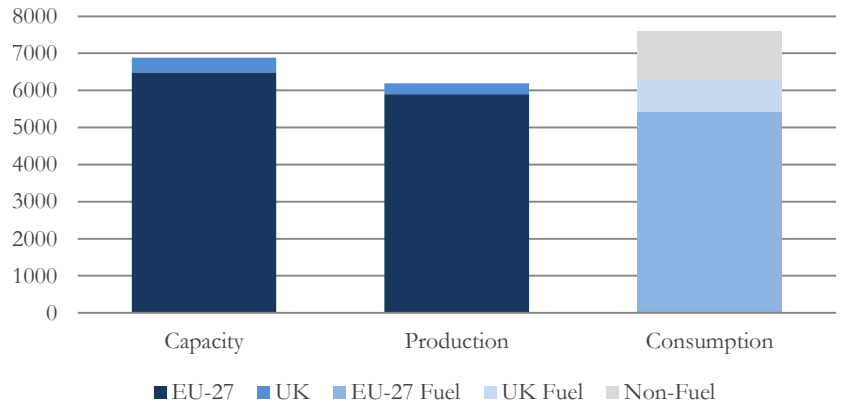


Source: Matelan Research based on EU FAS posts estimates, in million litres, 2021

High utilisation rates of European ethanol production capacities

The following chart illustrates the supply and demand balance in European ethanol. In fact, Europe is presently not fully covering its ethanol needs. Active capacities run at a healthy average utilisation rate of 90%. Whereas in previous periods we saw overcapacity, low utilisation rates and imports representing an additional burden, Europe now shows high utilisation rates and effectively requires additional imports of roughly 1.4bn litres to fulfil ethanol demand.

European ethanol supply and demand balance

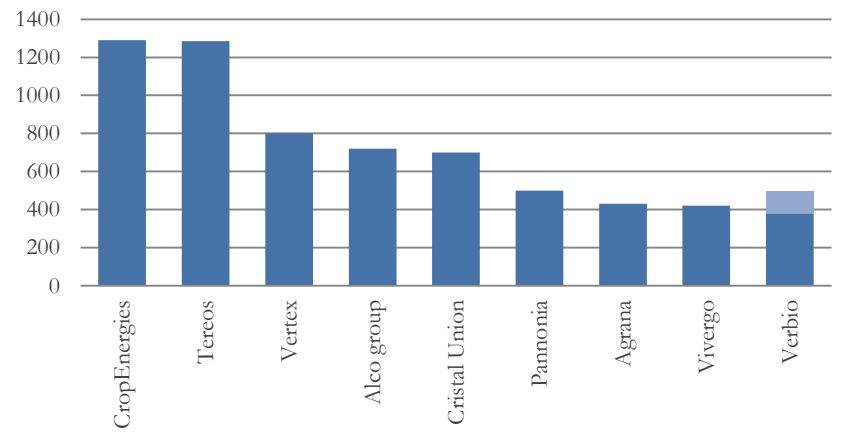


Source: Matelan Research based on EU FAS posts and own estimates, in million litres, 2021, excluding Vivergo

CropEnergies leads the market

With a capacity of 1.29m m³, CropEnergies is the largest ethanol producer in Europe. Agrana, like CropEnergies, belongs to the Südzucker Group. While CropEnergies has sites in four European countries, most competitors have a more regional focus with regard to the location of their sites.

Largest ethanol producers in Europe

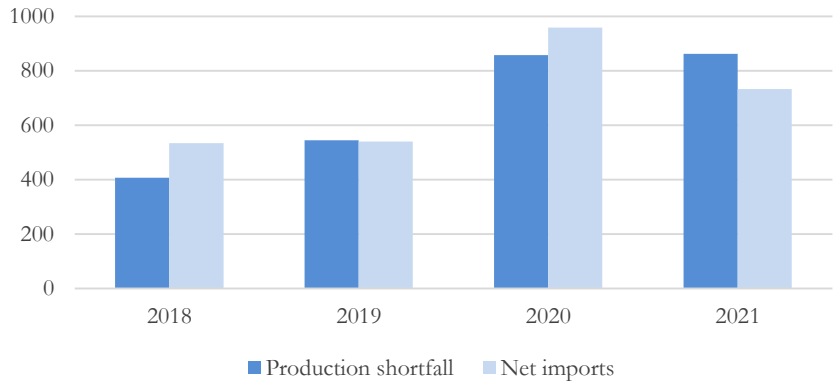


Source: Matelan Research based on company and ePure data, in 000 m3, Agrana also belongs to the Südzucker Group, Verbio shows the current expansion of the German sites but not the capacity that is currently built outside of Europe.

Imports move roughly in line with the EUs needs

EU ethanol consumption has been exceeding production for some time. The gap has been filled with imports, in particular from the US and Brazil. In order to count against the CO_2 reduction obligations in the transport sector, imports must equally fulfil the EU's sustainability criteria. In addition, the EU has implemented taxes and duties on imported ethanol. This system has so far successfully managed to attract roughly the required amounts. The following chart shows the EU's needs, i.e. the difference between production and consumption, as well as the net imports. For 2021, the EU showed net imports of roughly 700m litres, another 700m litres went to the UK. Temporary distortions of this balance can have an effect on prices, in particular when the price spread between European and overseas ethanol becomes too large, but here politics is likely to restore a balanced situation.

EU ethanol imports

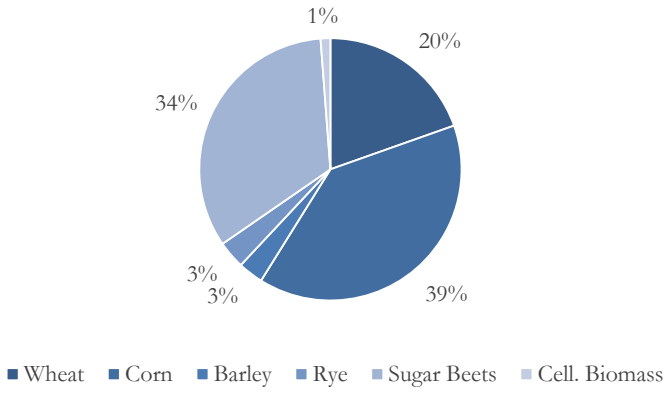


Source: Matelan Research based on EU FAS posts estimates, in million litres

Wheat, corn and sugar beet are most important feedstocks

On the feedstock side, wheat, corn, and sugar beets are the most prominent materials used in EU production sites, accounting for 93% of the total in 2021. Cellulosic biomass already comes to 1% of the feedstock total. With regard to the rather high share of sugar beets used in ethanol production it should be noted that it needs almost 4 times the amount of sugar beets to produce the same amount of ethanol when compared to using wheat.

Feedstock used in European fuel ethanol production

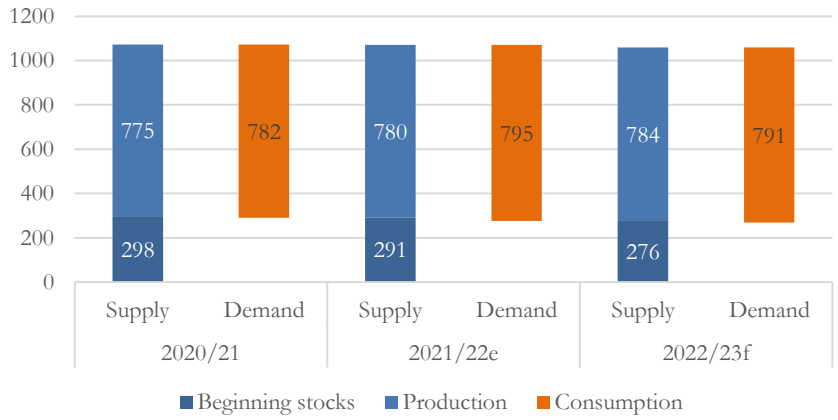


Source: Matelan Research based on EU FAS posts estimates, share based on MT used

Feedstock supply should remain stable

Wheat is the lead market on the feedstock side, in particular with regard to pricing. In fact, the price for corn moves very closely to the wheat price and rye trades at a small discount. Looking at the supply and demand situation, we feel that despite the assault on the Ukraine, one of the major suppliers of wheat in Europe, the situation is rather stable. Data from the September WASDE report shows that next year should be the third consecutive year in which world demand for wheat should exceed production but the small difference is covered by existing stocks. Moreover, the European Union continues to produce more wheat than it needs. This is also true when including other grains such as barley, corn, and rye. Although the Ukraine accounts for a large part of the EUs grain imports, the EUs exports are roughly twice as high, in the case of wheat even six times as high. We still could see distortions in the supply chains affecting pricing temporarily but prices should be expected to gradually converge towards normalised levels.

Worldwide supply and demand balance for wheat

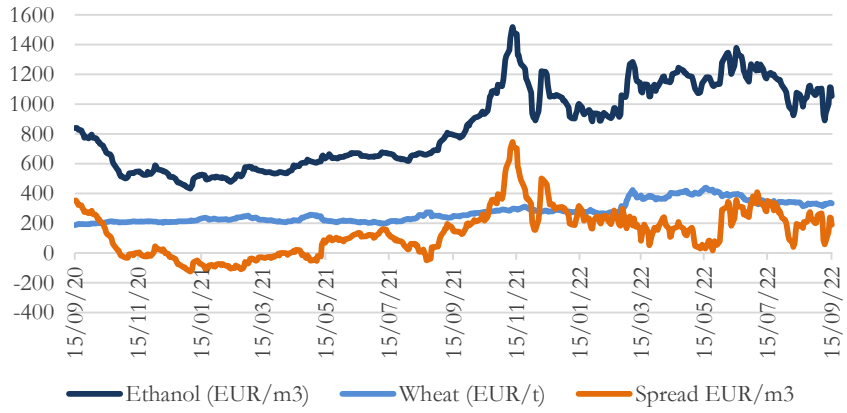


Source: Matelan Research based on USDA data, in million MT

Ethanol margin stands at a healthy EUR200/m³

The following chart illustrates the development of ethanol as well as wheat prices and the resulting spread that can be realised. Ethanol prices have skyrocketed from a low of almost EUR400/m³ at the beginning of 2021 to almost EUR1500/m³ just ten months later. Though still showing a high volatility, prices appear to settle in a range of EUR1000-1200/m³. Wheat prices also have experienced some increase from its historical range of EUR180-200/t to EUR270/t at the beginning of 2022. With the Russian attack on the Ukraine we saw a jump to around EUR400/t. This has come down to a level of EUR330/t in line with some easing of the supply situation. Most importantly, this still allows for a rather healthy spread between ethanol and wheat of around EUR200/m³.

Development of ethanol and wheat prices



Source: Matelan Research based on CME, Euronext and own calculations

Margins can be widened …

It should be noticed that this is the pure ethanol spread which does not yet include the sale of the by-products. Moreover, higher prices are generated for ethanol with above standard greenhouse gas reductions, in particular in Germany, and further processed products such as neutral alcohol. On the feedstock side, the companies do not use wheat that can be used for food but only buy the lowest and thus cheapest qualities. They also can vary between

the different feedstocks depending upon market prices. Against this background companies often realise higher spreads than the chart suggests.

… but higher energy costs must be compensated

On the other hand, we believe that higher spreads are currently needed to compensate for higher energy costs in the production process. The following chart illustrated the development of the Dutch natural gas future and the UK equivalent looks rather similar. Besides natural gas, also electricity prices have soared, which clearly is a burden to highly energy intensive chemical production processes.

Development of Dutch natural gas price

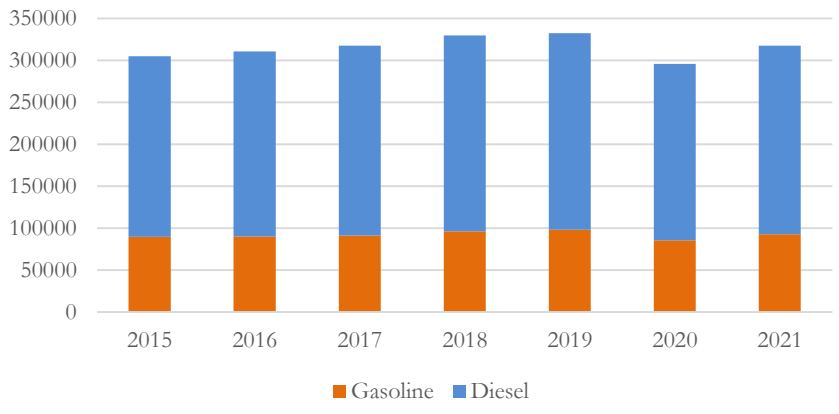
Source: Matelan Research based on CME, in EUR/GWh

GROWTH PROSPECTS

EU fuel consumption is rising …

The transport sector is a growth market that develops roughly in line with GDP. Despite all efforts to optimise fuel efficiency, fuel consumption has still been increasing. The European Union shows an average annual growth rate of 2.2% between 2015 and 2019. The pandemic has had a material effect on the use of cars in 2020 with some recovery in 2021. Despite not being back to pre-crisis levels, we are still looking at an average growth of 0.7% between 2015 and 2021. Over this period, the share of gasoline has remained rather constant at around 30%.

Development of fuel consumption in the European Union

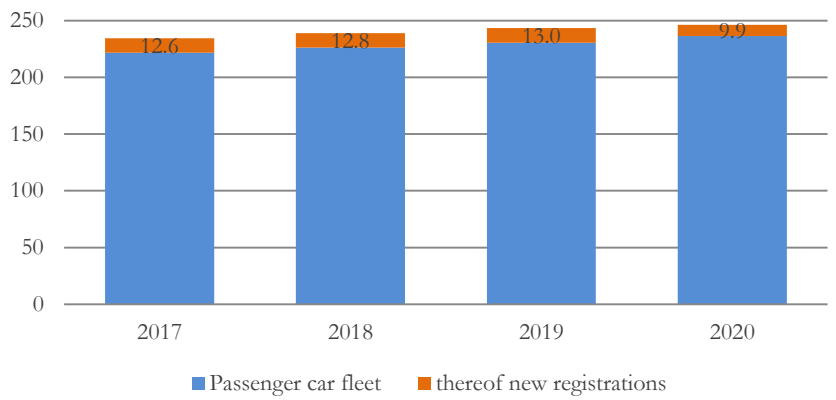


Source: Matelan Research based on EU FAS posts, includes biofuels, on/off road fuels excluding maritime and aviation, in million litres

… as the car fleet expands

The following graph illustrates a steady rise in the EU passenger car fleet. While growth amounted to roughly 2% before the pandemic, the year 2020 still showed an increase of 1.2%. We also find that new registrations increased to 13 million units in 2019. This came down to just below 10 million units in 2020.

EU passenger car fleet

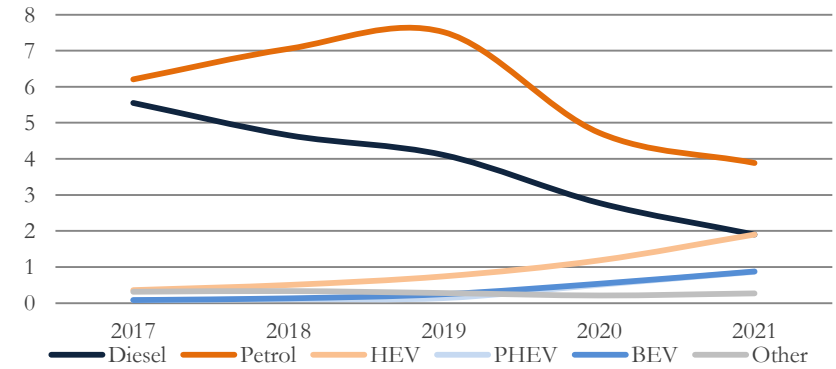


Source: Matelan Research based on ACEA data, in million units

Petrol cars gain at the expense of diesel

A further driver of growth in the ethanol market is the current change in the automotive industry. Looking at new car registrations by fuel type, it becomes clear that before the pandemic, the sale of petrol cars clearly increased at the expense of diesel cars. During the pandemic in 2020 and 2021, the decline of diesel cars has continued whereas the sale of petrol cars appears to settle around 4 million units. In particular, hybrid electric vehicles (HEV), which still use significant amounts of fuel, in general petrol, have experience strong growth over recent years.

EU new passenger car registrations by fuel type



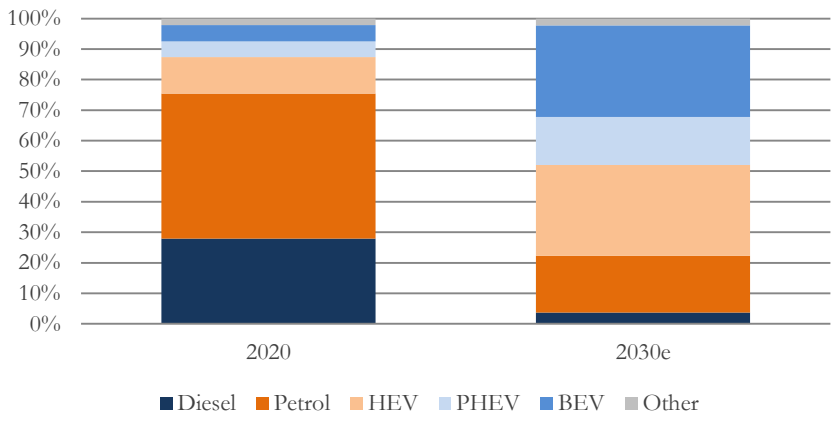
Source: Matelan Research based on ACEA data, in million units, plug in hybrids reach similar levels compared to battery electric cars

New car types could account for 75% of new registrations by 2030 …

In its Global EV Outlook, IEA estimates that based upon current policies, 7.3m new EVs (BEV plus PHEV) could be sold in Europe in 2030, and a major share of this should fall within the EU. The following chart compares new registration in 2020 with an estimated level for 2030. New car types could account for 75% of new registrations by then, with battery electric cars having gained the largest market share. In their "Sustainable Development

Scenario", which assumes increasing incentives for EVs, IEA projects 9.7m new EVs in 2030. However, there are currently quite a number of concerns with regard to the expansion of electric cars, in particular regarding the construction of the required infrastructure. We believe that the stated policies scenario is already quite optimistic.

EU new passenger car registration by fuel type

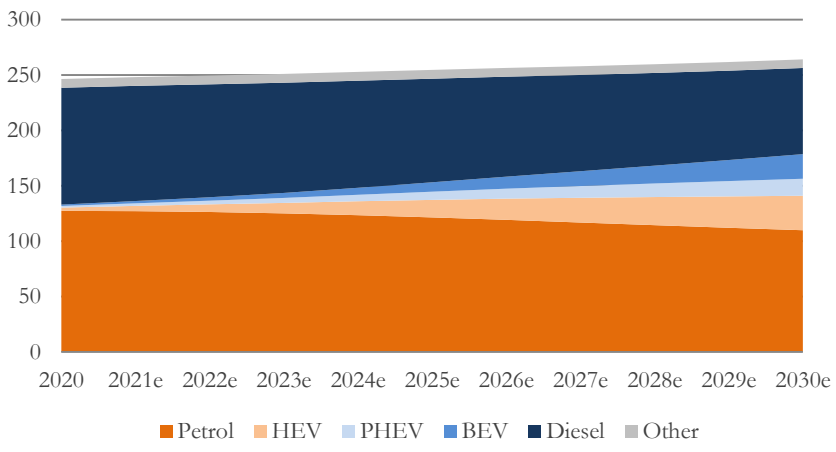


Source: ACEA, Matelan Research estimates

… but the number of cars using petrol should still rise

It should also be noticed that new registrations account for only around 5% of the car fleet. The impact on the pool is thus rather limited. Although our estimates for EVs significantly exceed the EU's 30m units target for 2030, petrol and diesel cars should still account for roughly 70% of the market. Including HEVs, the number of petrol cars should even rise by 8% over the period.

Development of EU passenger car fleet by fuel type



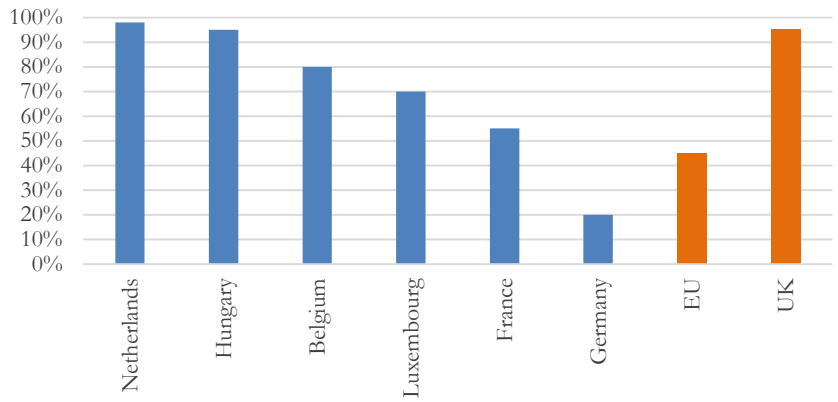
Source: ACEA, Matelan Research estimates, in million units

Ethanol benefits from the increasing use of higher blends

Moreover, we see an additional upside in particular for ethanol. Fuels have to meet certain standards and the diesel sold for passenger cars currently includes up to 7% of biodiesel (B7). For petrol, we currently have two fuel major blends, up to 5% of ethanol (E5) and up to 10% of ethanol (E10). The use of these blends varies from country to country. Among the larger member states, the Netherlands, and Hungary have already reached an E10

share of 95% or more. This is also true for the UK. In contrast, in particular in Germany, the largest European ethanol market, consumers have until recently shied away from using E10. However, from an E10 share 14%, Germany has already moved to 20% at the end of last year. The latest figures for June 2022 revealed a share of 25%, showing that the country is further catching up with the other member states in this regard. In contrast to biodiesel, there is thus an upside in the use of ethanol coming from an increased acceptance of E10 as well as an introduction of even higher blends.

Share of E10 fuel ethanol consumption by country

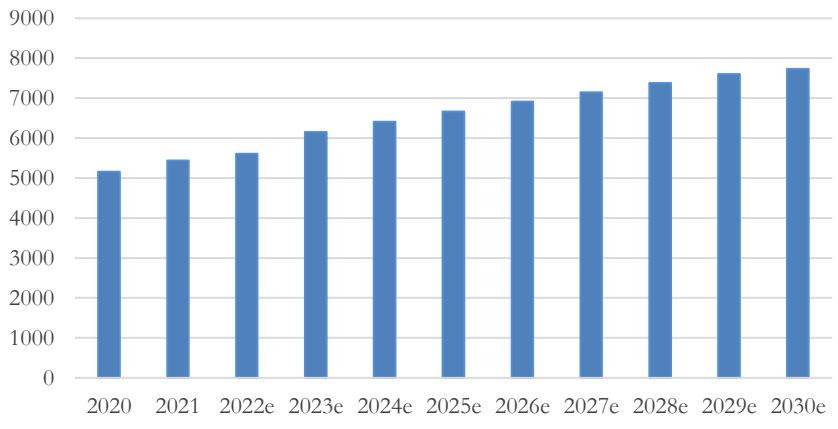


Source: Matelan Research based on ePURE estimates for 2022

EU fuel ethanol market could rise by 50% until 2030

Putting this all together, a moderate increase in the passenger car fleet, the expected shift in fuel types, and a slight increase in E10 acceptance, we arrive at an increase of the EU fuel ethanol market of 50% over the period 2020-2030 to 7.7bn litres. Including the UK and non-fuel uses we would thus be looking at something around 9bn litres. While first generation biofuels in the EU are capped to the 2020 level +1pp with a maximum of 7%, bioethanol can grow at the expense of biodiesel. Moreover, there are a number of cellulosic ethanol projects under way such as Clariant's recent investment in Romania or CropEnergies' participation in LPX, which could help to satisfy the rising demand for second generation bioethanol.

Development of demand for fuel ethanol in the EU



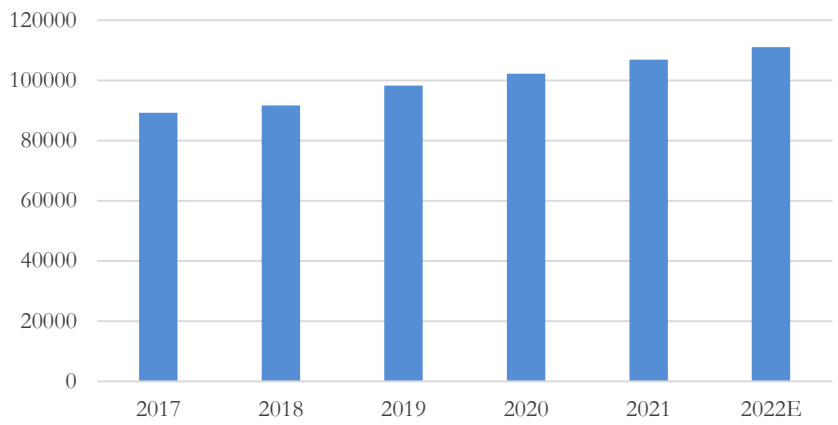
Source: FAS Posts, Matelan Research estimates, in million litres

METHANOL

Global demand for methanol grows at 4.5%

Global demand for methanol reached 106m tonnes in 2021. For 2022, an increase to 111m tonnes is expected. Average annual growth over the period 2017 to 2022 amounts to 4.5%.

World demand for methanol

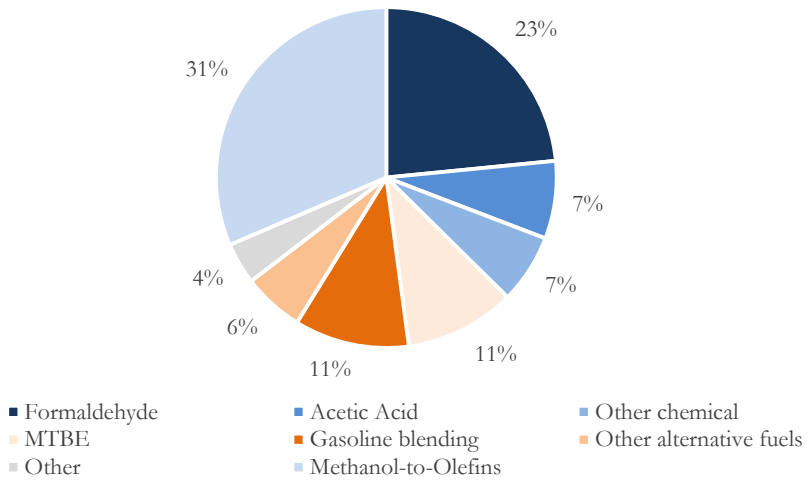


Source: Matelan Research based on MMSA data, in 000 tonnes

Alternative fuel segment is expected to rise …

In 2021, more than 70% of global demand came from a number of chemical applications with "methanol-to-olefins" being a major driver of growth for the market. Fuels accounted for 28% of the market, with 11% going into gasoline blending. While the latter has experienced some decline over the past years, we expect this market segment to show strong growth due to the tightening fuel regulation in particular in the maritime and aviation sectors.

Global demand for methanol by application

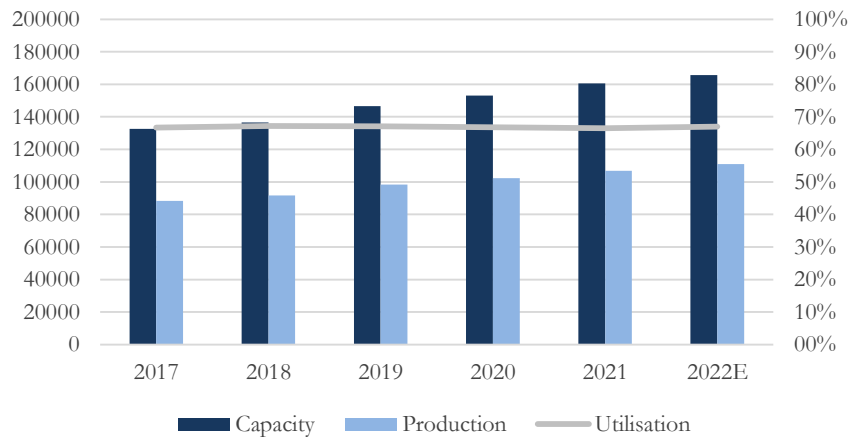


Source: Matelan Research based on MMSA data, 2021

Supply moves in line with demand

The following chart shows that global supply has developed well in line with demand, equally growing at 4.5% over the period. Production almost perfectly meets demand and utilisation rates are stable at around 67%.

Global supply for methanol

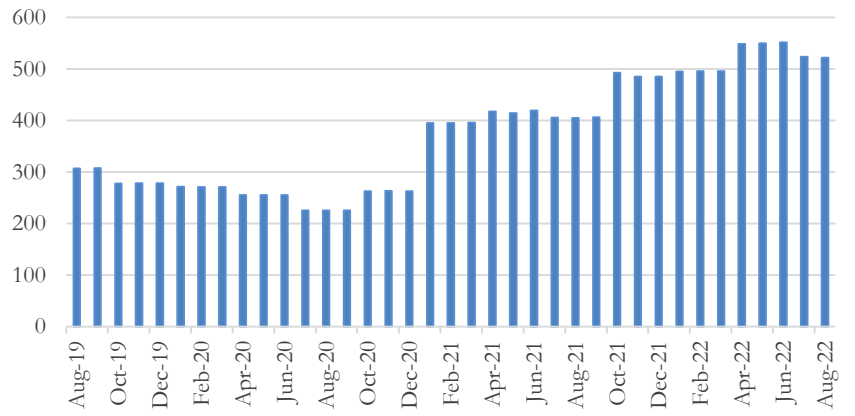


Source: Matelan Research based on MMSA data, in 000 tonnes

Prices are increasing

Despite the rather stable supply/demand balance we have seen a material increase in methanol prices. Since the start of 2021, methanol prices have moved from a level of just below EUR300/t to now EUR500/t. For renewable methanol, the market is expected to pay a premium, in particular as production costs are still exceeding current pricing for fossil methanol. However, with increasing maturity, production costs for both, bio-methanol as well as e-methanol could come close to the current production costs of fossil methanol, which currently yields a healthy spread of roughly 50%.

Methanol contracts Rotterdam

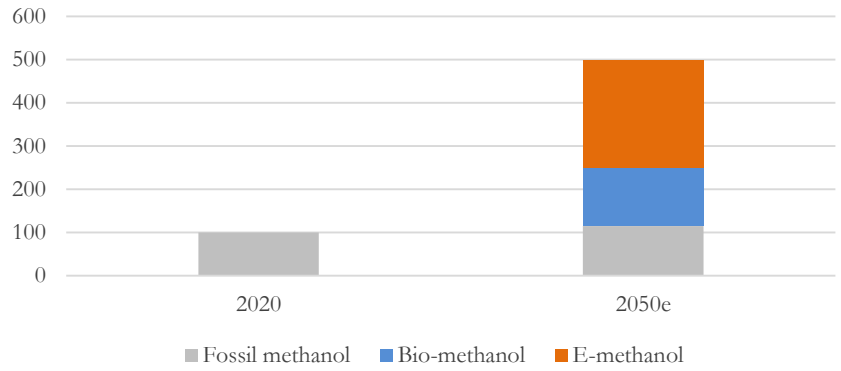


Source: Matelan Research based on MMSA data, in EUR/t

Methanol market could increase five-fold until 2050

Looking forward, Irena projects global methanol production to rise five-fold until 2050 and renewable methanol is expected to account for almost the entire increase. In view of the greater cost reduction potential compared to bio-methanol, e-methanol is expected to account for 50% of the market by then. This would require 920GW of installed solar capacity or 500GW of installed wind capacity. In addition, 350 million tonnes of CO_2 are needed.

Global methanol production forecast



Source: Matelan Research based on IRENA data, in million tonnes

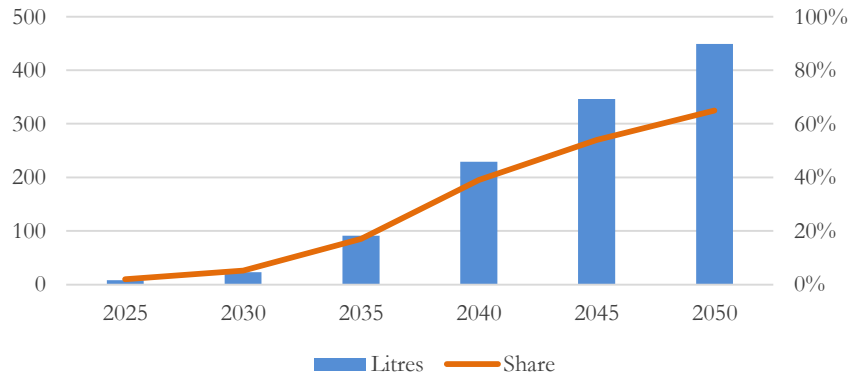
Rising demand for renewable fuel methanol coming from maritime, …

According to the amendment plans for RED II, the shipping sector will be included in the European Emission Trading Systems (ETS) and shippers are already looking for partners to deliver renewable methanol. Moeller Maersk has announced in March that it has found a partner to source the first vessel to operate on carbon neutral methanol. European Energy, an operator of roughly 3GW of wind and solar capacity will build an e-methanol facility in Denmark that shall deliver 10.000 tonnes of e-methanol to Maersk in 2023. According to European Energy, 200.000-300.000 tonnes of e-methanol shall be delivered to Maersk from 2025 onwards.

… as well as aviation

Methanol also serves as a base for Sustainable Aviation Fuels (SAF), for which the EU has defined separate targets. The International Air Transport Association (IATA) has the ambition to generate net zero carbon emissions by 2050 and defined a roadmap for the use of sustainable aviation fuels that is largely consistent with requirements set by the EU. The following chart illustrates the major milestones of this plan, requesting 23bn litres of SAF in 2030 and 449bn litres in 2050, i.e. 65% of the industry's fuel needs.

Use of SAF according to IATA's Net Zero Carbon Emissions Plan



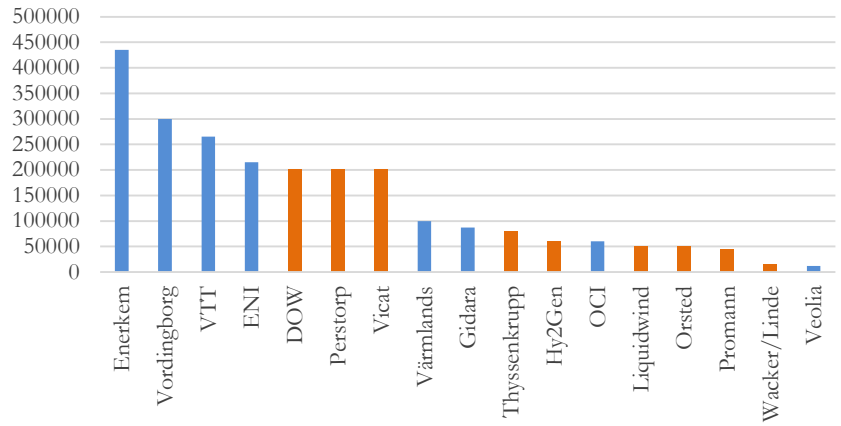
Source: Matelan Research based on IATA data, in billion litres

Numerous renewable methanol projects in the making

In Europe, there are thus quite a number of renewable methanol projects currently under construction. The following graph gives an overview of the largest projects that have published an intended capacity. In particular Enerkem works on two projects, one in the Netherlands with a capacity of

215,000 tonnes and one in Spain with 220,000 tonnes. Most of the projects listed here are planned to start production within the next three years. As usual, not all projects can be expected to meet their timeline or will be finished at all.

Major renewable methanol projects in Europe



Source: Matelan Research based on MMSA data, planned capacity in tonnes, projects based on electricity in orange, organic processes in blue

ETHYLENE

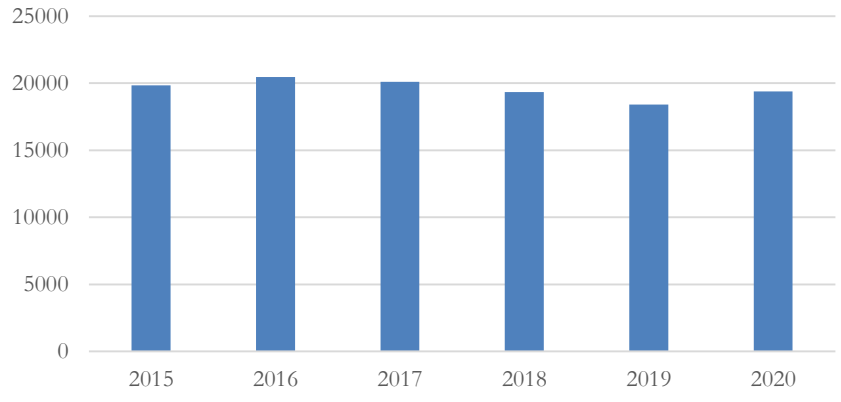
Base chemical for a wide variety of uses

Ethylene is the largest bulk chemical with a global production of 166m tonnes in 2020 and accounting for around half of all plastics. Ethylene traditionally originates from steam cracking refined crude oil (Naphta). The product is then transformed to a variety of plastics, in particular to polyethylene, which is used for example in food packaging. As Ethylbenzene it goes into consumer electronics or the automotive industry. Ethylene dichloride is used for example in medical applications, ethyl oxide is needed for footwear or adhesives.

Demand for ethylene has been rather stable

European ethylene consumption has been rather stable between 2015 and 2020 at around 20m tonnes per year. 2019 showed some dip, which had been recovered in 2020 to a large extent despite the pandemic.

Development of European ethylene consumption

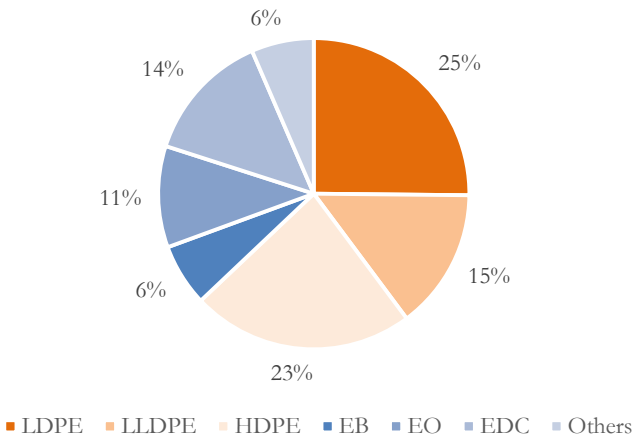


Source: Matelan Research based on Petrochemicals Europe data, in 000 tonnes

Polyethylene represents 63% of the market

In 2020, Polyethylene (LDPE, LLDPE and HDPE) accounted for a share of 63% of this market. Ethyl dichloride and ethyl oxide came to shares of 14% and 11%, respectively. Compared to 2015, in particular LDPE and LLDPE have shown slight growth whereas the other uses have a slightly lower consumption. This is a trend that can also be observed when looking at the past 20 years.

European ethylene consumption by application

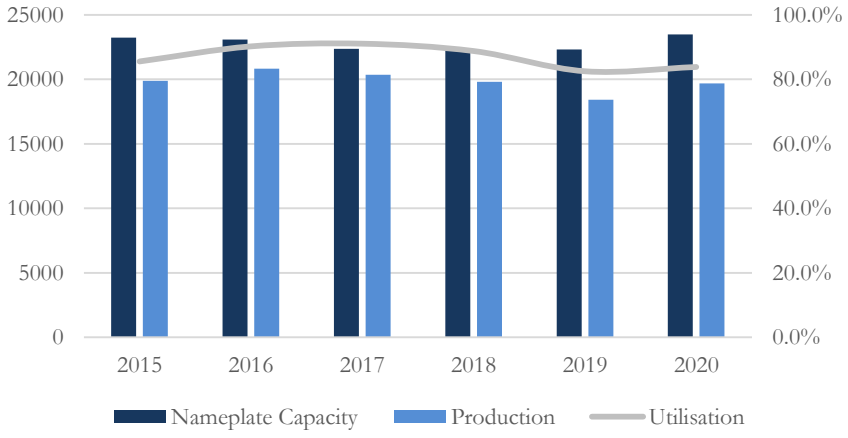


Source: Matelan Research based on Petrochemicals Europe data, 2020

Supply moving in line with demand

Over the past years, production in Europe has tracked demand and capacities have also moved roughly in line. Capacity utilisation has averaged at a healthy 87% over the period.

Development of European ethylene capacity and production

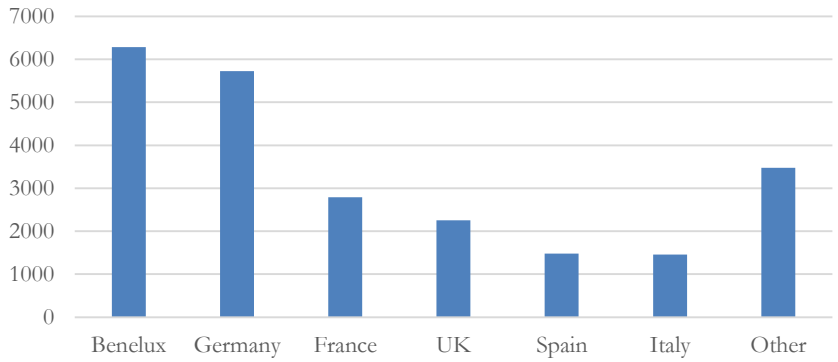


Source: Matelan Research based on Petrochemicals Europe data, in 000 tonnes

Belgium and Germany are largest producers

European cracker capacity is located in particular in Benelux and Germany. Together, the two account from just over 50% of European capacity. France, the UK, but also Italy and Spain also have substantial capacities. No other country comes to more than 1m tonnes per year.

Cracker capacity for ethylene production in Europe

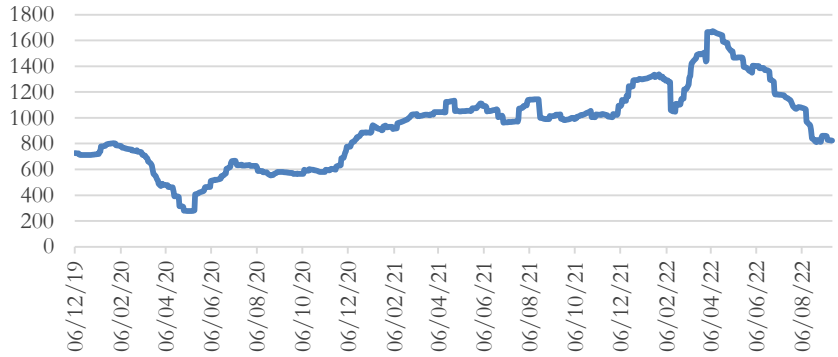


Source: Matelan Research based on Petrochemicals Europe data, 2021, in 000 tonnes

Volatile price development

The following chart shows that prices for ethylene have increased quite dramatically since the beginning of 2020, moving from the latest low of EUR280/t to more than EUR1600/t. With around EUR800/t, the price is now back to a more decent level.

Development of ethylene price

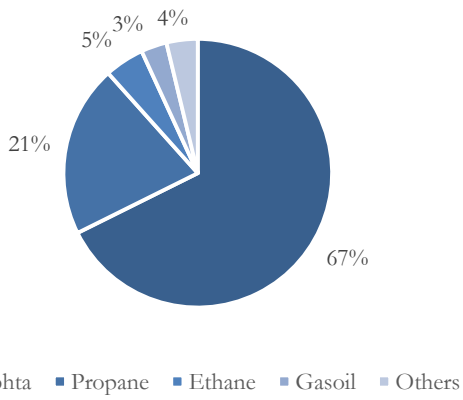


Source: Matelan Research based on various sources, in EUR/tonne

Naphta is the dominant feedstock

The following chart illustrates that with a share of 67%, Naphta is clearly the dominant feedstock used in European crackers. Propane comes to a share of 21%.

Feedstock in European crackers

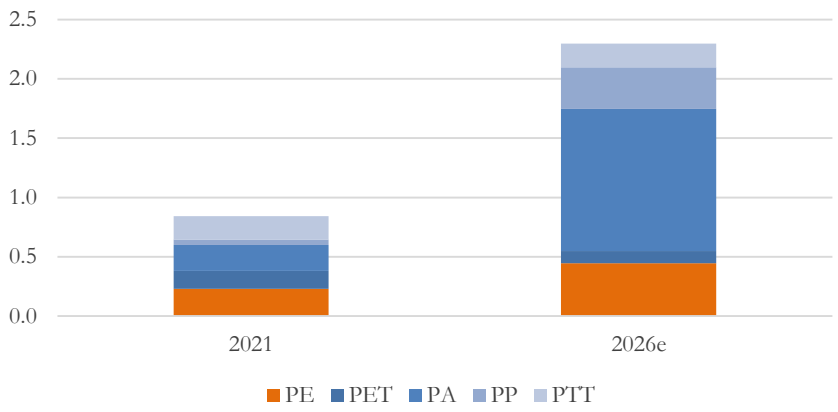


Source: Matelan Research based on Petrochemicals Europe data, 2020, in 000 tonnes

Bio-based polymers are expected to grow at a CAGR of 22%

In order to reduce the industry's dependency on mineral oil, bio-ethylene can be produced by dehydrating ethanol that comes from renewable sources such as starch or cellulosic biomass. The market for bio-based polyethylene is still small. Global capacities for bio-based polymers amounted to 0.8 million tonnes in 2021, polyethylene came to 0.2 million. The following graph illustrates the expected growth of the different applications until 2026. Non-degradable bio-based plastics should increase to 2.3m tonnes, an average annual growth rate of 22%. Bio-based polyethylene is expected to grow at a rate of 14%. While almost 50% of the production capacity in 2026 is expected to be in Asia, Europe is likely to become the second largest region with a share of 24%.

Market development of bio-polymers



Source: Matelan Research based on European Bioplastics data, in million tonnes

Supply of renewable ethylene is scarce

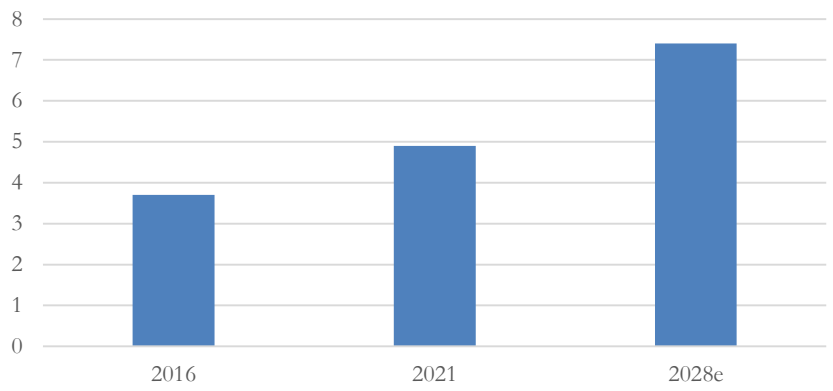
While there is clearly demand for renewable ethylene from companies such as Tetra Pack, Shiseido, Johnson&Johnson, or Procter&Gamble, only few projects appear to be under construction. Brazilian petrochemical company Braskem was one of the pioneers in this regard with the construction of a 200,000 tonnes plant in 2010 in Brazil. In 2021, Braskem announced to licence its technology together with its partner Lummus. In a joint venture with India Glycols, Clariant aims at the production of green surfactants and ethylene oxide derivatives.

ETHYL ACETATE

Market should grow at around 6%

Ethyl acetate is commonly used as a solvent that is found in numerous consumer products such as nail polish remover, paint or adhesives. The global market size reached almost 5m tonnes in 2021, showing an average annual growth rate of 5.8% over the past five years. Forecasts for the coming years vary between 4% and 8%, averaging at around 6%.

Market development of ethyl acetate

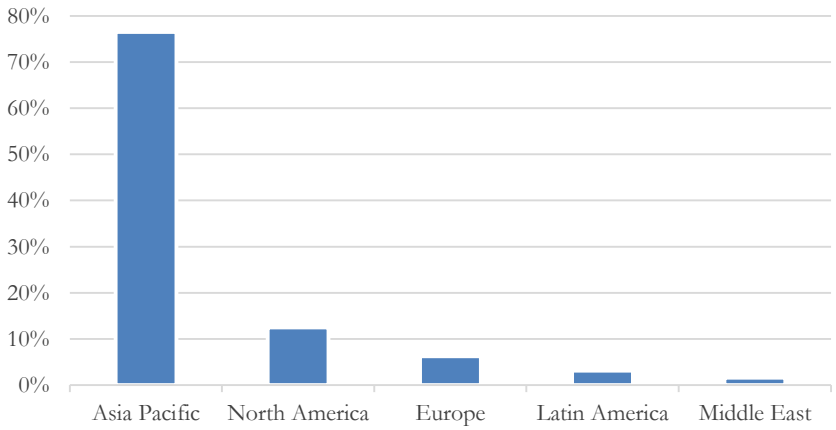


Source: Matelan Research based on Penn Engineering, Coherent, in million tonnes

Asia Pacific is the dominant region

Accounting for more than three quarters, the Asia Pacific region dominates the market. North America is just north of 10% and Europe roughly half of this.

Market share by region

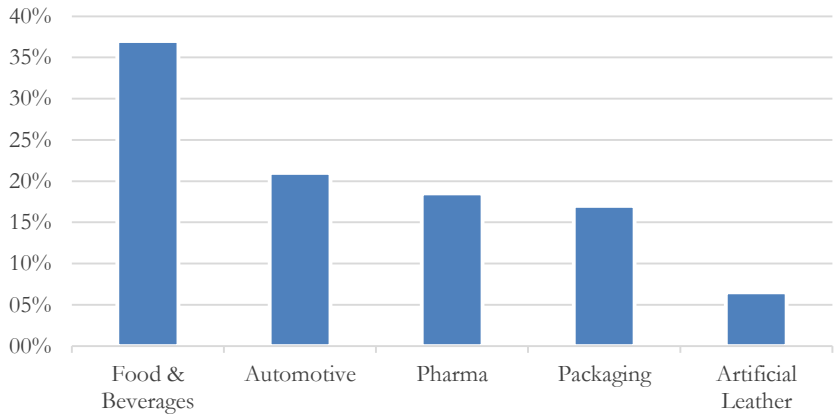


Source: Matelan Research based on various sources, 2021

In particular pharma and packaging drive growth

With more than 35%, the largest part of the ethyl acetate market goes into Food & Beverages. Automotive comes to around 20%. Market growth in Pharmaceuticals, increasing demand for Flexible Packaging as well as Artificial Leather are the main drivers of growth.

Market share by application



Source: Matelan Research, Coherent, 2021

High volatility in ethyl acetate prices

With regard to pricing, we have seen a material increase from a level of around EUR1000/t to almost EUR3000/t. Most recently prices have come back to a level of EUR1300/t. Ethyl acetate tends to be produced from natural gas. Depending on the prices for feedstock and the end product a number of suppliers can switch their production to other chemical products, which has an effect on the pricing of ethyl acetate.

Development of ethyl acetate price

Source: Matelan Research based on various sources, in EUR/tonne

Renewable ethyl acetate still at an early stage

The market for renewable ethyl acetate appears to be still in its infancy. At the beginning of this year, Viridis Chemical has announced that it has started production of its plant in Nebraska and expects to come close to full capacity utilisation.

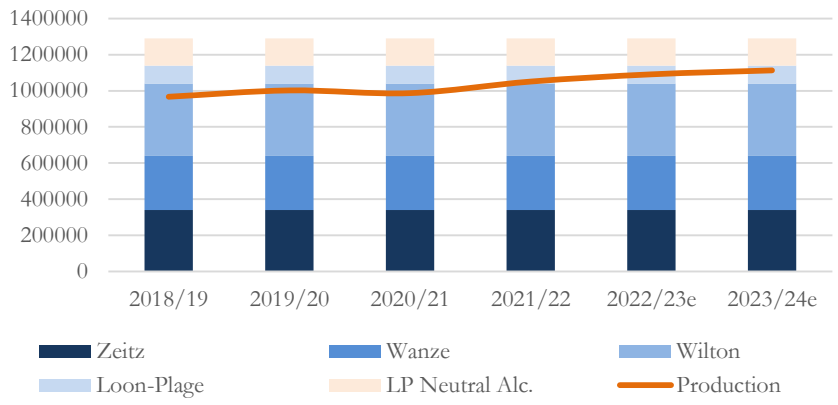
FINANCIAL DEVELOPMENT

BIOETHANOL

1.29m m³ of bioethanol capacity …

CropEnergies operates a total capacity of 1.29m m³ at its four locations across Europe. Production has increased over the past years to 1.05m m³ in 2021/22, yielding an average utilisation of 81.5%.

Capacity and production of bioethanol

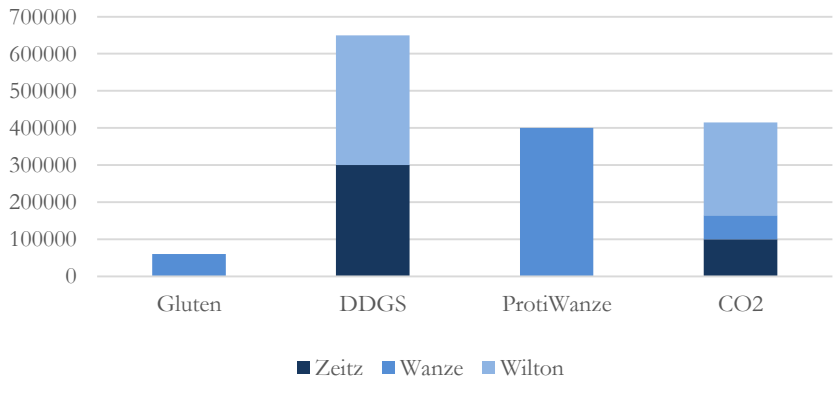


Source: Matelan Research based on CropEnergies data, in m³

… and major provider of food, feed and CO_2

The following chart illustrates the production capacity of CropEnergies' by-products. The company does not provide separate production figures for food and feed but production here largely depends on the production of bioethanol. It should be highlighted that in view of the grain that the company uses, there is still room to roughly double CO_2 production.

Capacity of by-products



Source: Matelan Research based on CropEnergies data, in tonnes

FY 2022/23 will come in exceptionally strong

In FY 2021/22, CropEnergies reached revenues of more than EUR1bn and an operating profit of EUR127m. For the current year, we now even expect the company to come close to EUR1.5bn in sales and almost a doubling of operating profit to EUR246m.

Q2 has brought record earnings and a net cash position of EUR354m

In fact, the company has just released the best quarter result in its history with an operating profit of EUR92.5m. The following table shows that this is perfectly in line with our high expectations. The company surprised, however, positively on the top line due to an outstanding production, the highest level, the company has reached so far with a utilisation of 94%. Moreover, the company has now EUR354m of net financial assets at its disposal

Q2 22/23 review

EURm	Q2 22/23	Q2 22/23e	Q2 21/22	Change	FY 21/22	FY 22/23e old	FY 22/23e new	Outlook
Production	302000	270000	285000	6.0%	1051000	1060000	1133000	
Sales	449.8	397.2	249.2	*80.5%*	1075.3	1535.8	1574.7	1470-1570
Gross profit	132.0	124.5	57.2	*130.8%*	259.2	375.4	393.6	
Margin	*29.3%*	*31.3%*	*22.9%*		*24.1%*	*24.4%*	*25.0%*	
EBITDA	103.1	102.5	33.7	*206.4%*	168.8	282.4	288.4	255-305
Margin	*22.9%*	*25.8%*	*13.5%*		*15.7%*	*18.4%*	*18.3%*	
Operating profit	92.5	92.0	23.3	*297.0%*	127.0	240.4	246.4	215-265
Margin	*20.6%*	*23.2%*	*9.4%*		*11.8%*	*15.7%*	*15.6%*	
Net profit	70.9	67.5	14.7	*381.5%*	89.4	166.2	185.4	

Source: Matelan Research based on CropEnergies data and own estimates

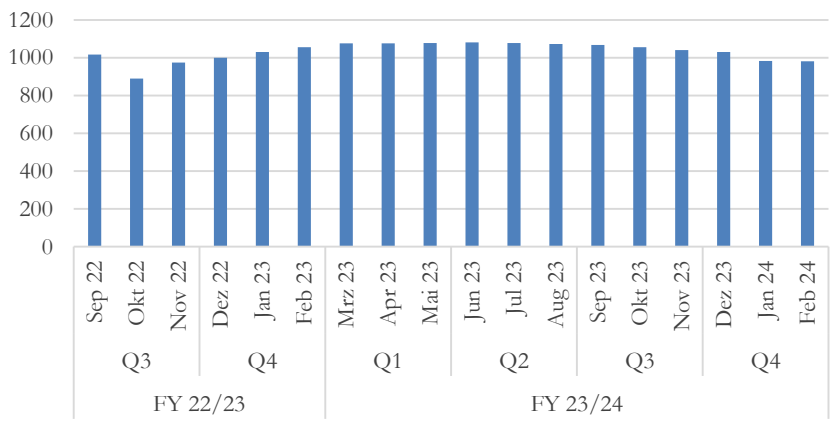
75% of FY2022/23 guidance mid-point has been reached in H1

In the first quarter, CropEnergies had already delivered an incredible EUR87m in operating profit so that the company has 75% of the mid-point of its current guidance (EUR215-265m in operating profit) already at the half year stage.

Temporary dip in ethanol prices …

We do not expect the company to show a similar performance in the second half of the year. The following chart illustrates that imports have put some pressure on ethanol prices in Q3, in particular in October. However, the forward curve also suggests some easing in Q4 and for FY2023/24, forwards are back above the EUR1000/m³ mark.

Ethanol forward curve

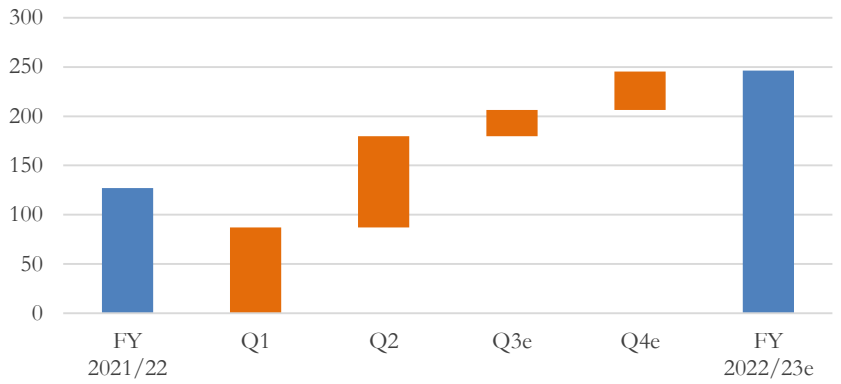


Source: Matelan Research based on Platts data, in EUR/m³, Futures as of 11/10/2022 except for September 22 price

… still leaves CropEnergies heading for EUR246m in operating earnings

We also expect hedging gains on the feedstock side to come in lower towards the end of the year. Revising our estimates on the base of Q2 results and the current forward curves brings us to an operating earnings estimate of EUR66m for the second half of the year. We thus raise our full year estimate slightly to EUR246m, which is just ahead of the mid-point of the company's guidance.

Development of operating earnings in 2022/23

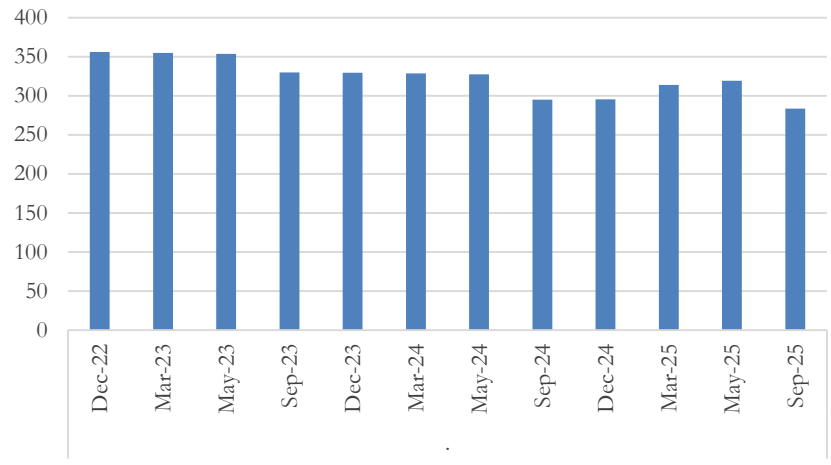


Source: Matelan Research, in EURm

Rising costs in FY2023/24 …

It should also be clear that FY2023/24 must be expected to come in weaker than the current year as the company should no longer benefit from hedging gains and has to face higher energy costs. Ethanol forwards average at EUR1045/m³ for the year while the forward curve for wheat suggests a level of EUR340/tonne.

Wheat forward curve

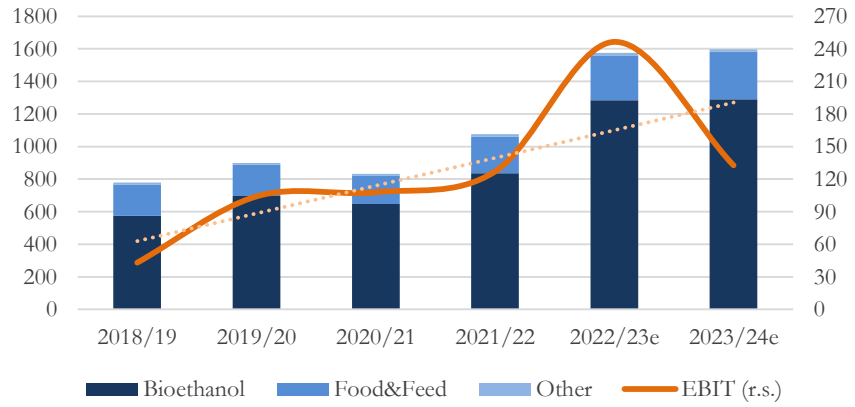


Source: Matelan Research based on Matif data as of 11/10/2022, in EUR/tonne

… should still allow for EUR133m in operating profit

This still leaves us with an EBIT estimate of EUR133m, EUR14m more than we had assumed so far. This means the FY 2023/24 is likely to beat the strong earnings level that CropEnergies posted for the past financial year 2021/22.

Development of sales and EBIT



Source: Matelan Research based on CropEnergies data and own estimates, in EURm, dotted line shows EBIT trend

UK site under review

In view of higher feedstock costs but more importantly due to soaring energy prices, CropEnergies has announced to review its site in Wilton, UK, which, in contrast to the other sites, is fully dependent on external energy sources. CropEnergies, had already mothballed production in Wilton in 2016 due to low ethanol pricing at the time. This obviously had an effect on production and sales but the EBIT impact was limited. Against the background of the British Government aiming to support local production and in view of the importance of the site as the major UK producer of bioethanol, a provider of up to 350.000 tonnes of animal feed and 250.000 tonnes of biogenic CO_2, we feel that there might be a solution to keep rising costs in check. The recent cap on UK energy prices already goes in the right direction. Our estimates thus still include Wilton on the top line, while we do not expect a material contribution to EBIT.

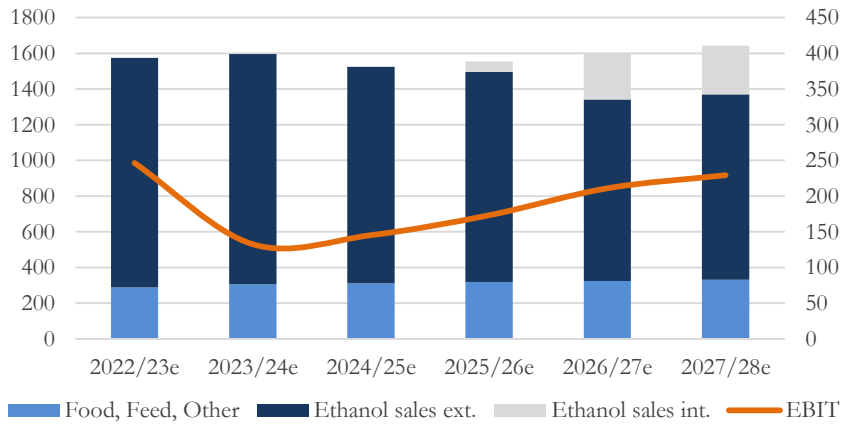
Positive earnings trend

Despite the volatility in earnings, CropEnergies shows a clearly positive earnings trend, resulting from tightening CO_2 regulation driving ethanol prices and from efficiency improvements. While FY2023/24 should come in weaker than the current financial year, forward prices for wheat suggest a further decline to below EUR300/tonne in subsequent years, which at ethanol prices of around EUR1000/m³ should allow CropEnergies to achieve an EBIT margin of 14%. Within this context it should be highlighted that 10% of production the company's is from waste materials, which can be sold at a premium price. Neutral alcohol also sells at a premium to ethanol, though on a fix price basis.

Gradual return to EUR230m in EBIT

Looking at the development over the investment phase of the new activities, we find that a significant part of sales should become internal sales. However, this has no effect on EBIT, so that we should see return to EUR230m until 2027/28, which comes close to the extraordinary level of the current year.

Development of sales and EBIT over the investment phase



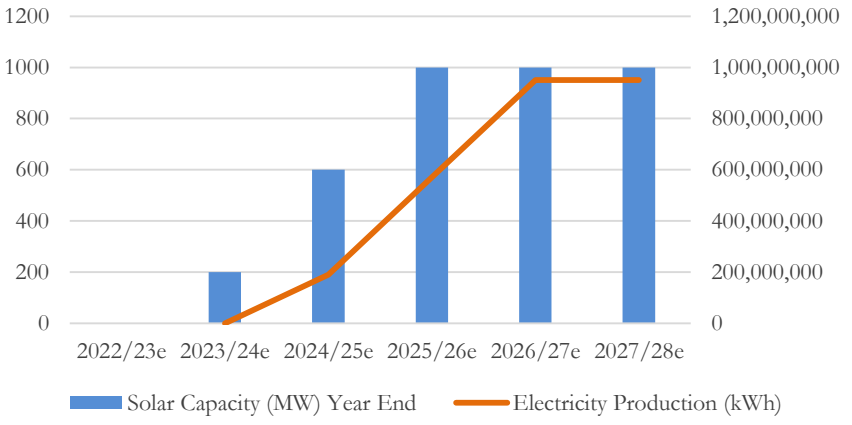
Source: Matelan Research based on CropEnergies data, in EURm

RENEWABLE METHANOL

Ramp up of 1GW in solar capacity …

CropEnergies intends to enter the methanol market in two steps. The first move is to develop a solar capacity of 1 GW as the basis for the methanol production. East Energy, the company holding the development rights has the target to build this capacity by the end of 2024. With procurement not being easy in the current market development we are prudently planning with the full capacity available at the end of 2025. The following table shows the expected development of capacity and production. We believe that it would be a logical step to complement the solar capacity with wind farms, so that electricity production could be held more stable throughout the year. There is thus an upside to the current plan.

Development of solar capacity and production



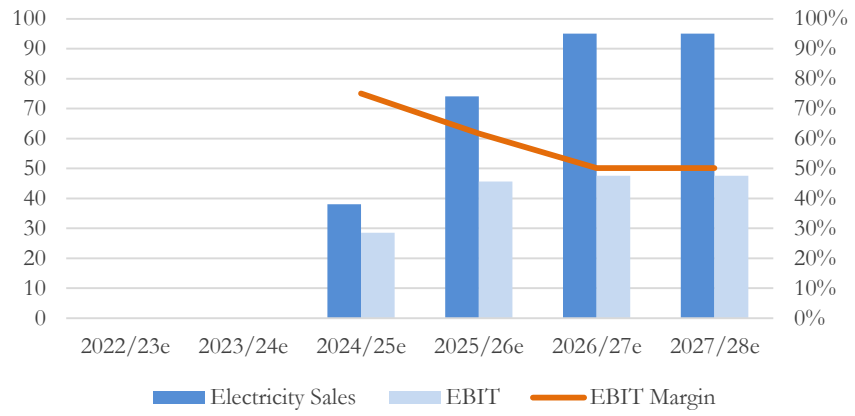
Source: Matelan Research, capacity left scale, production right scale

… could yield EUR48m in EBIT

The plan is to start selling the electricity to the grid or to industrial customers before until methanol is ramped-up. Based on current electricity prices, this would yield very strong returns. However, we would expect electricity prices to fall to a level that is more tolerable for the industry. With a reduction to EUR100/MWh by 2026/27, we believe to be on the conservative side. In

addition, we have seen prices for solar panels in Germany already increasing by 20% since the beginning of the year. Investment spending could thus well exceed EUR700m. These assumptions still yield an interesting return profile with sales amounting to EUR95m in 2027/28 at an EBIT margin of 50%.

Development of solar sales and margin

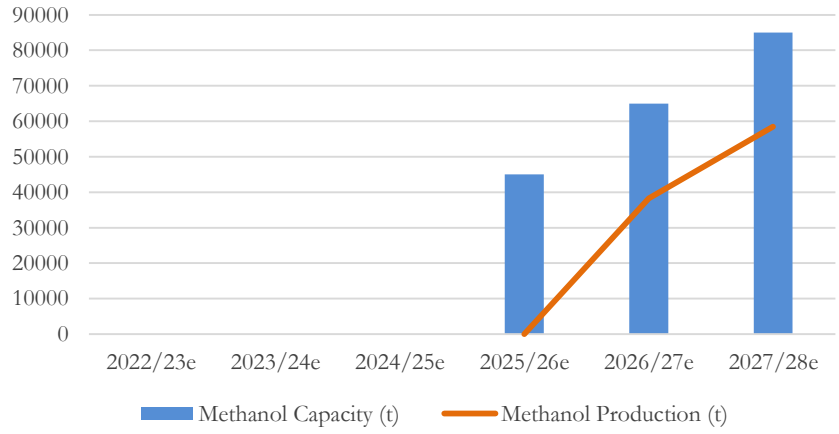


Source: Matelan Research, sales and EBIT left scale in EURm, EBIT margin right scale

Following methanol production …

The move into the renewable methanol market should come with a time lag to the solar activities but a capacity of 40.000 tonnes should already be available by the end of 2025 so that production can start in 2026. Capacity should gradually be increased further over subsequent years.

Development of methanol capacity and production

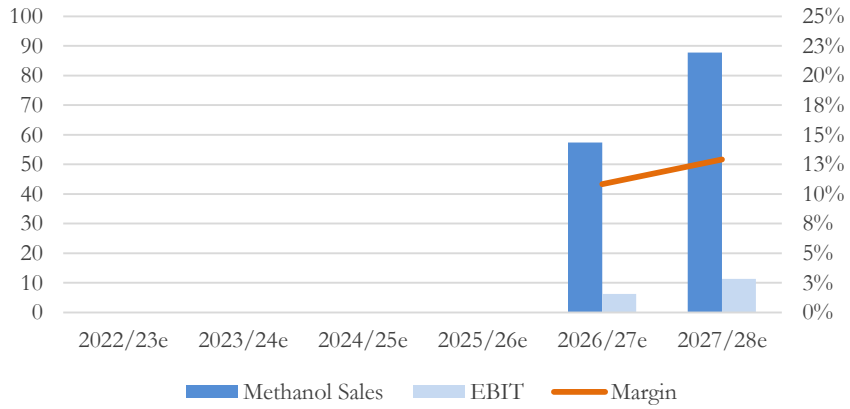


Source: Matelan Research, capacity at year end

… could add EUR11m in EBIT

The critical point for the production of renewable methanol is the price. Based on prices for fossil methanol, no renewable methanol project would be realised. Still, regulation requires the use of renewable ethanol so that the price will move to a point at which suppliers can earn a decent margin. We believe that at an electricity price of EUR100/MWh, the price for renewable methanol should move to a level around EUR1500/t. This would leave CropEnergies with almost EUR90m in sales and an EBIT margin just north of 10%, according to our calculations.

Development of methanol sales and margin

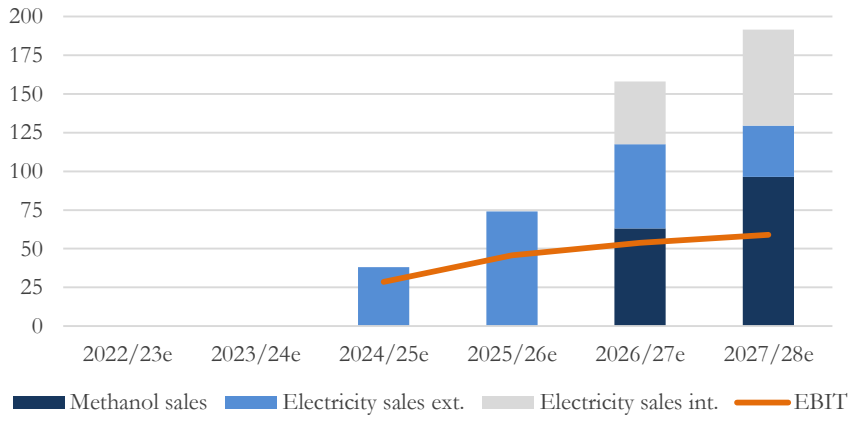


Source: Matelan Research, methanol sales and EBIT left scale in EURm, EBIT margin right scale

Division is heading for EUR130m in sales and EUR59m in EBIT

As an integrated activity, the EBIT of the methanol activities add to the EBIT of the electricity activities, whereas a major part of the electricity sales become internal sales. According to our calculations, CropEnergies could thus reach EUR130m in sales and EUR59m in EBIT from these activities.

Development of divisional sales and EBIT



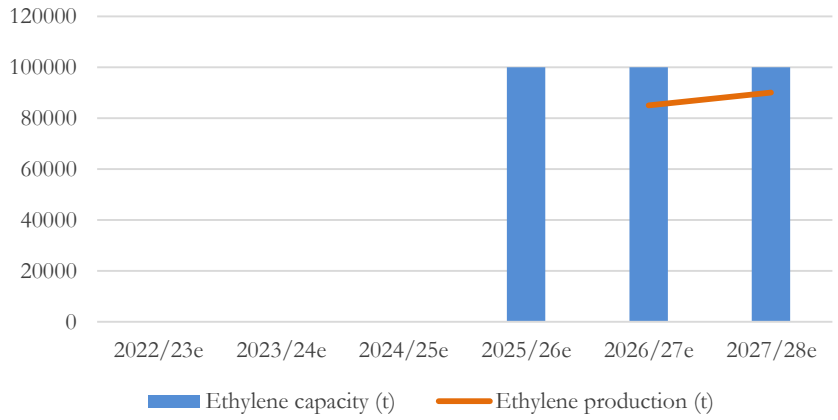
Source: Matelan Research, in EURm

RENEWABLE ETHYLENE

100,000 tonnes of renewable ethylene capacity

CropEnergies has taken a stake in Syclus, a company that intends to build a 100.000 tonnes production of renewable ethylene in the industrial park Chemelot, Geelen, Netherlands, that should become productive in the course of 2026. We believe that this is a realistic time scale and calculate with a production of 85% in 2026/27 and 90% in 2027/28. We anticipate the ethanol to could come from CropEnergies' production site in Wanze, Belgium, but external sourcing, is an option for the company, in particular if there are interesting arbitrage opportunities.

Development of ethylene capacity and production



Source: Matelan Research, in tonnes, capacity at year end

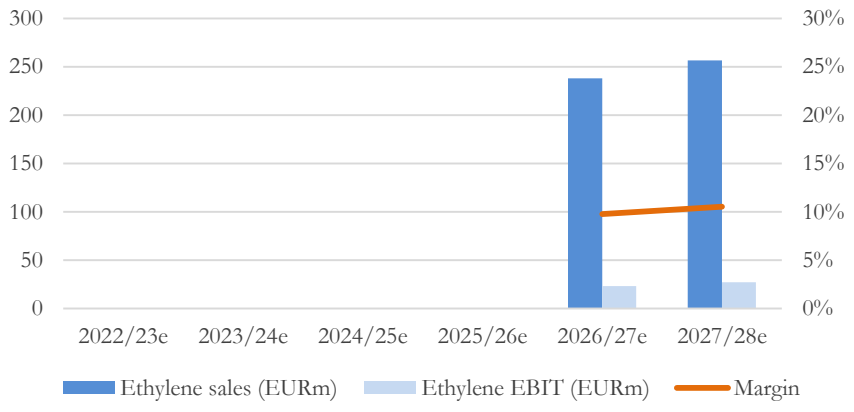
Renewable plastic comes at a price

Similar to the methanol market, current prices for fossil ethylene are not sufficient to trigger any investment in renewable ethylene. In contrast to methanol, there is no obligation to fulfil any politically set quotas. Still, we have illustrated in the previous section of this report that the market for renewable ethylene is expected to show significant growth over the coming years. Consumers are willing to pay a premium for renewable products and packaging tends to account for only a fraction of the price of the end product. Most of the projects that are currently under construction should thus be able to realise a price that recovers production cost plus a decent margin. We expect that given current ethanol prices, the renewable ethylene price should reach around EUR2850/t.

Heading for EUR257m in sales and EUR27m in EBIT

We would expect CropEnergies to sell the renewable ethylene directly to chemical companies which could then produce the various ethylene derivatives and do the marketing to the final customers. Based on the above described assumptions, the company could generate sales of EUR257m and an EBIT of EUR27m in FY 2027/28.

Development of ethylene sales and margin



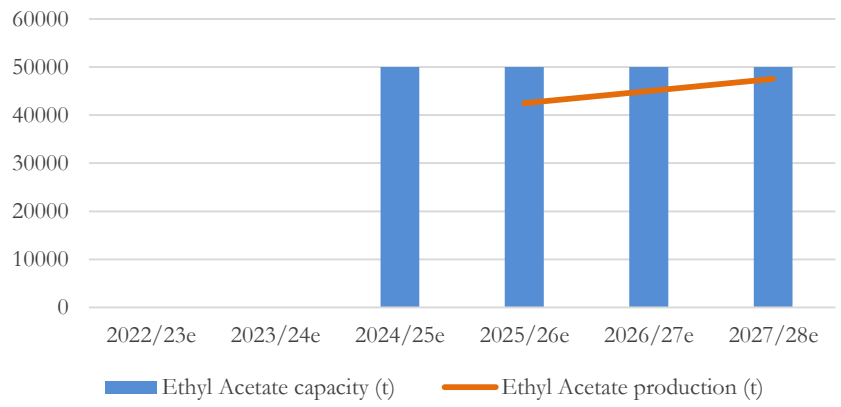
Source: Matelan Research, EBIT margin right scale

RENEWABLE ETHYL ACETATE

Building 50.000t of renewable ETAC in Zeitz …

Close to its site in Zeitz, CropEnergies plans to build a 50.000 t renewable ethyl acetate facility, making use of ethanol produced at the site. Johnson Matthey will prepare the process design in 2022, which will be the base for the final investment decision. Investments are planned to amount to EUR80-100m and we calculate with the upper end. We estimate that construction could be finished by the end of 2024 so that production could start in FY2025/26.

Development of ethyl acetate capacity and production

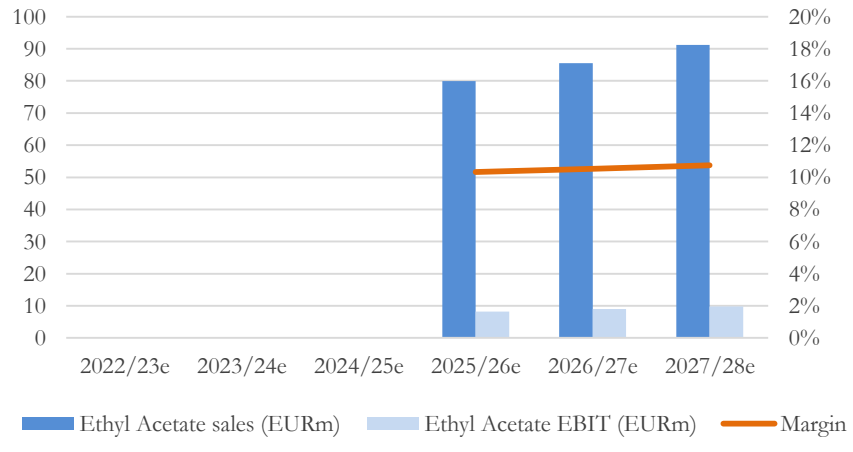


Source: Matelan Research, capacity at year end

… could bring EUR91m in sales and EUR10m in EBIT

Although prices for fossil ethyl acetate are well above ethylene prices, they are still not high enough to start a production of renewable ethyl acetate. Thus, demand for renewable ethyl acetate also comes at a price. We believe that on the base of ethanol prices in the region of EUR1000/m3, the price for renewable ethyl acetate should come to EUR1920/t as this would grant a just high enough margin to start a production. On this basis we arrive at ethyl acetate sales of EUR91m and an EBIT of EUR10m.

Development of ethyl acetate sales and margin



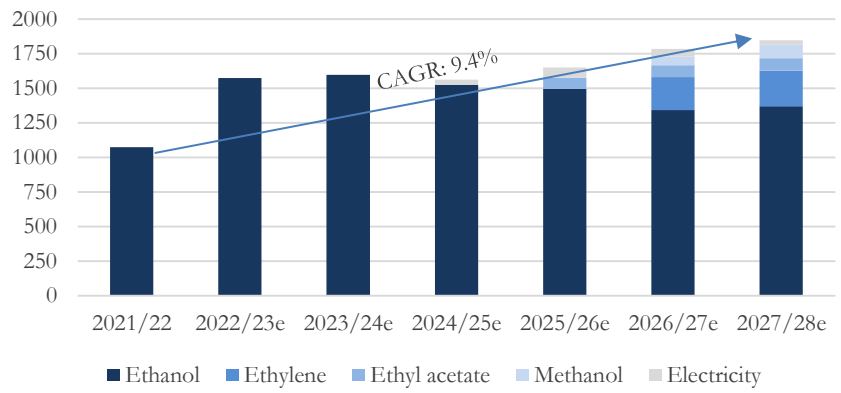
Source: Matelan Research, margin right scale

GROUP FIGURES

New growth phase …

Though CropEnergies has so far spent only little money and final decisions on the above described expansions are not yet taken, management is clearly committed to follow the above described routes. Combining the markets that the company intends to address, we arrive at the following picture for the development of the group.

Development of group sales by activity



Source: Matelan Research, external sales, in EURm

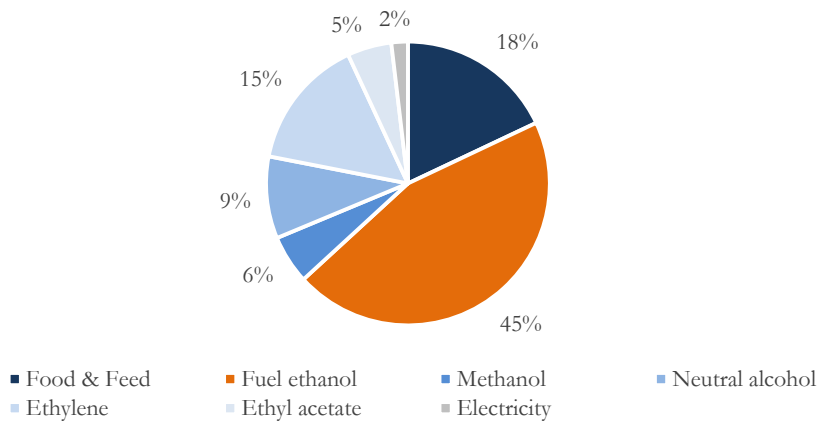
… with a CAGR of 9.4%

For ethanol, we anticipate a slight increase in production but a normalisation of prices to a "new normal" of around EUR1000/m3. From 2025/26, own ethanol is increasingly used for the ethylene and ethyl acetate production. Methanol production adds to this with electricity capacity being slightly higher than needed for the production of methanol. This new growth phase could yield a CAGR of 9.4% over the period 2021/22 to 2027/28. If CropEnergies decided to source part of the production externally, growth would clearly increase.

Fuel ethanol could fall well below 50% of group sales by 2027/28

Looking at the resulting distribution of sales in 2027/28 in a bit more detail, we find that the company could cut its exposure to regulated markets to 45 % of group sales. 20% could come from food & feed as well as electricity, and 35% from chemicals and e-methanol.

Distribution of sales in 2027/28

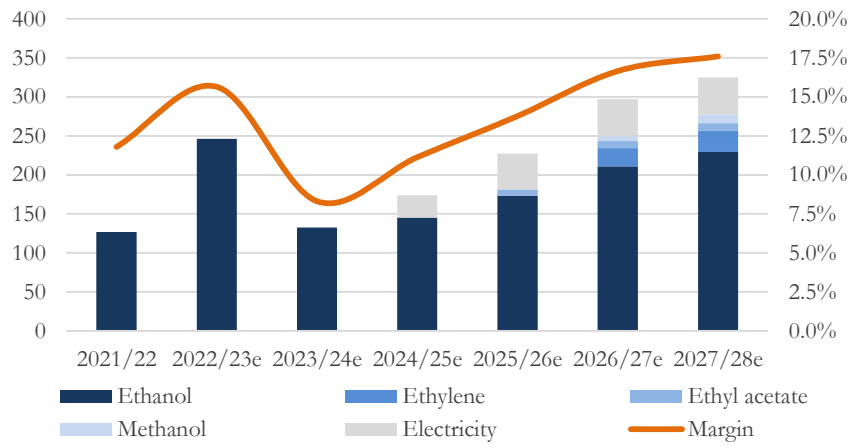


Source: Matelan Research

EBIT margin could reach 17.5%

Our assumption that the ethanol used in the production of ethylene and ethyl acetate is fully sourced internally weighs on growth but favours the margin development of the group. Though we anticipate rather normal margin levels for all activities, the fact that the company extends its value chain leads to a clear margin expansion. Electricity sales should also have a positive effect on margins due to their above average EBIT margin. In fact, we expect the group to reach an EBIT margin of 17.5% in 2027/28. Based on more than EUR1.8bn in sales, EBIT could thus reach EUR325m in 2027/28.

Development EBIT and margin

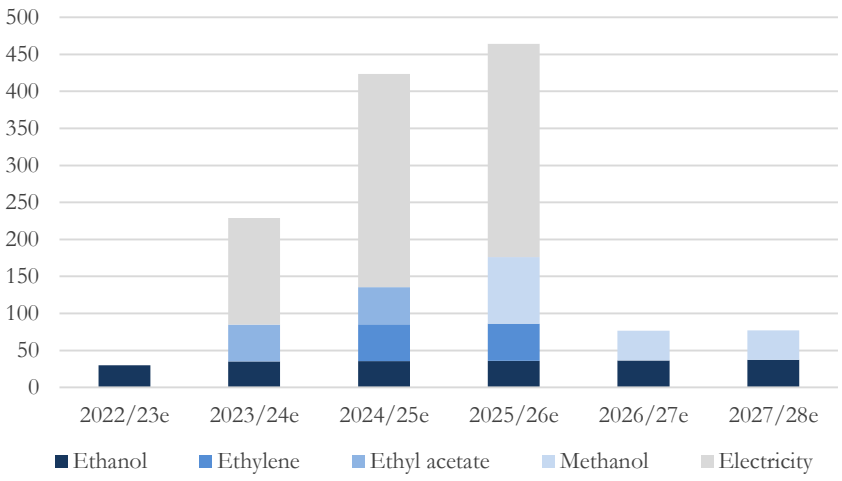


Source: Matelan Research, in EURm, EBIT margin right scale

Investing around EUR1.3bn

The following chart illustrates that CropEnergies could spend around EUR1.3bn for the envisaged expansion. The predominant part should be invested in Germany. A peak could be reached in the financial year 2025/26, with capex of just more than EUR450m.

Development of capex by activity

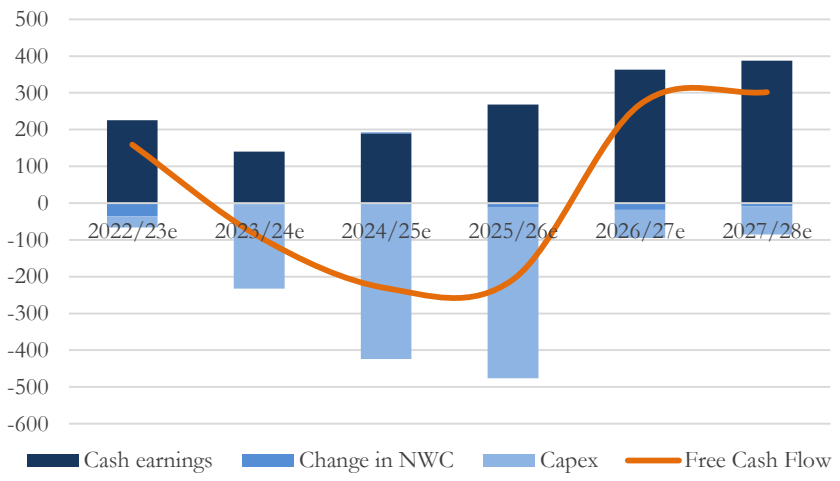


Source: Matelan Research, in EURm

Cash flow should cover capex over the investment phase

While investments in particular in 2024/25 and 2025/26 should not be fully covered by the company's cash flow, the additional money required should be more than recovered in 2026/27 and 2027/28. In fact, we expect a positive free cash flow of almost EUR200m when looking at the entire period.

Cash Flow development



Source: Matelan Research, in EURm

Moderate increase in leverage expected

However, management intends to safeguard a strong cash position. It is thus evaluating a number of green project financing schemes. We would thus expect the company to become more leveraged but stick to the target of a maximum Net Debt / EBITDA ratio of 3.

VALUATION

DCF Valuation comes to EUR26

Our main valuation tool is a DCF model, which is based on the detailed financial estimates for the coming two years that are laid out at the end of this report. We have then accounted for the targeted expansion until FY 2027/28 that we have described in the previous part of this report. We then assume the company to realise only some small efficiency improvements based on the existing capacity before going into the terminal value. The following table details all elements of the valuation, which yields a fair value per share of EUR26.

DCF model

DCF	2021/22	2022/23e	2023/24e	2024/25e	2025/26e	2026/27e	2027/28e	2028/29e	2029/30e	2030/31e	2031/32e	TV
Sales	1,075.3	1,574.7	1,597.1	1,562.0	1,650.0	1,783.4	1,847.0	1,905.3	1,957.5	2,003.1	2,041.4	2,072.1
Growth	*29.1%*	*46.4%*	*1.4%*	*-2.2%*	*5.6%*	*8.1%*	*3.6%*	*3.2%*	*2.7%*	*2.3%*	*1.9%*	*1.5%*
EBIT	127.0	246.4	132.7	173.9	227.2	297.1	325.1	334.9	343.7	351.3	357.7	362.6
Margin	*11.8%*	*15.6%*	*8.3%*	*11.1%*	*13.8%*	*16.7%*	*17.6%*	*17.6%*	*17.6%*	*17.5%*	*17.5%*	*17.5%*
Depreciation	41.8	42.0	41.8	60.9	99.4	141.9	145.7	150.7	155.3	159.3	162.9	165.8
Other non cash items	-2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cash taxes	-34.8	-63.3	-34.0	-45.0	-59.4	-78.4	-86.7	-90.2	-93.5	-96.5	-99.2	-101.5
Change in NWC	15.8	-36.0	-3.0	2.1	-11.9	-18.0	-8.6	-7.9	-7.1	-6.2	-5.2	-4.1
Investments	-34.9	-30.0	-219.0	-423.5	-464.1	-76.6	-77.1	-152.4	-156.6	-160.2	-163.3	-165.8
Free Cash Flow	**112.0**	**159.0**	**-81.5**	**-231.6**	**-208.8**	**265.9**	**298.3**	**235.1**	**241.9**	**247.8**	**252.8**	**256.9**
PV of Free Cash Flows (EV)	**2,069.4**	**147.6**	**-70.2**	**-185.1**	**-154.8**	**183.0**	**190.5**	**139.4**	**133.0**	**126.5**	**119.7**	**1,439.8**
- Net financial debt	229.9											
- Pension provisions	-32.4		Risk free rate		2.1%		TV:	5.5%		TV growth rate		1.5%
- Minorities	0.0		Credit spread		1.5%	Risk premium		4.0%		TV EBIT margin		17.5%
+ Participations	2.8		Cash tax rate		28.0%	Beta		1.4		TV depreciation rate		8.0%
Equity Value	**2,269.7**		Share of debt		0.0%		TV:	20.0%		TV NWC ratio		13.5%
No of shares	87.3		**WACC**		**7.8%**		**TV:**	**10.0%**		TV Investment ratio		8.0%
Fair Value per share	**26.0**											

Source: Matelan Research

Margin increase drives valuation

This is a massive increase compared to our previous valuation of EUR18.3 which already suggested that the company's ethanol activities were undervalued. Compared to our previous valuation we have increased the WACC to reflect the recent rise in interest rates. On the other hand, we have slightly raised our estimates for 2022/23e and 2023/24e based on the release of Q2 accounts and current ethanol and wheat forwards. However, the valuation increase is predominantly driven by an improved medium-term outlook for ethanol and the anticipated expansion of the company. While we believe that CropEnergies can operate at a 14% ethanol margin as a "new normal", the expansion into new markets based on the existing ethanol production should drive group margin even further. Against this background we expect the company to drive its EBIT margin from 11.8% in the past financial year to 17.5% in 2027/28.

Still room for more

While success in any of the newly targeted markets is not guaranteed, it is the increasing flexibility in the company's operations that makes us confident that CropEnergies will deliver on our forecasts. Changing economics for one project could lead to stronger investments in another. Produced ethanol can be used internally in the production of chemicals but external sourcing would add to growth. Most importantly, we are assuming no further expansion investments after FY 2027/28. In fact, the company has plenty of options to scale its projects further, add further elements such as wind parks or invest in second generation ethanol to serve the rising demand here.

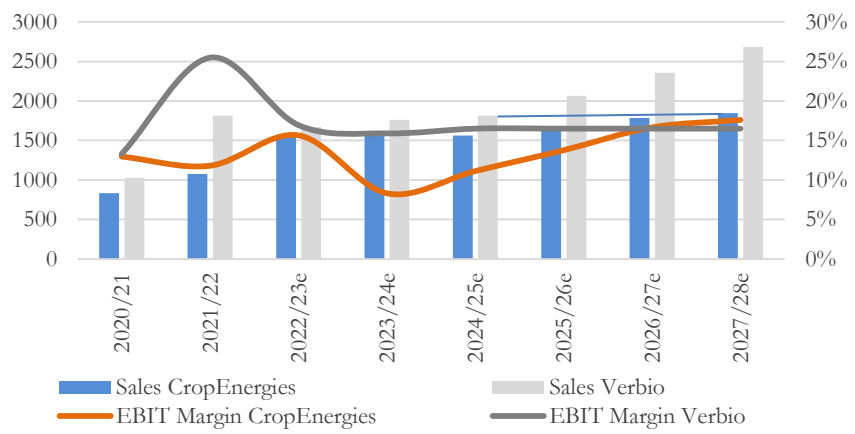
Verbio is the only reasonable peer

We always countercheck the results from our DCF model with the valuation multiples of comparable companies. The closest comparable to CropEnergies is Verbio. Both companies are leading players in the European biofuel industry and are thus benefitting from the increasingly tightening regulation on CO_2 emissions. There are also differences with regard to operations. Whereas CropEnergies has a focus on ethanol and is the European leader in this market, Verbio is active in both, biodiesel and bioethanol. And while CropEnergies produces proteins from the mash coming out of its ethanol production, Verbio uses the mash to produce renewable natural gas. Both companies are currently in the process of taking advantage of the various opportunities that the market currently offers. However, while key topics for Verbio are the expansion of its ethanol capacities in Germany and the US as well as the expansion of RNG and LNG, CropEnergies prioritises the move into chemical products and e-methanol while keeping its European focus.

Expansion plans yield similar growth prospects

The following chart shows the growth and margin prospects of the two companies that we derive from their expansion plans. Verbio has started earlier and aims at expanding its capacity until 2023/24. We should thus see the full benefits already in 2024/25. Moreover, Verbio has made it clear that follow-up investments should be made so that growth can be maintained. This is already part of our estimates from 2025/26 onwards. Still, with its expansion, we expect CropEnergies to meet the sales level Verbio can achieve based on the current investment plan. Moreover, we believe that CropEnergies' integrated approach should allow the company to achieve a higher margin level, leaving the company with similar earnings growth.

Comparison of sales and margin development



Source: Matelan Research, sales left scale in EURm, CropEnergies' financial year ends at the end of February, Verbio's at the end of July.

Comparison of multiples …

In fact, the anticipated expansion appears to lead to a rather similar EBIT increase from the last reported year until 2027/28, i.e. a CAGR of 17.1% in the case of CropEnergies and 18.3% in the case of Verbio. Looking at the current valuation of the two companies, we feel that this is not yet reflected in CropEnergies share price. While the market appears to perceive Verbio as a growth stock and has rerated the stock since the announcement of the first investment phase, the new prospects of CropEnergies have not yet had a material impact on the share. We would expect this to change with the company taking the final investment decisions.

Comparison of multiples

		Verbio	CropEnergies	CropEnergies FV
Share price (EUR)		68.50	13.12	26.00
No of shares (m)		63.40	87.25	87.25
Market Capitalisation		**4,342.8**	**1,144.7**	**2,268.5**
+ Net Debt		-269.6	-229.9	-229.919
+ Pension Provisions		0.1	32.4	32.352
+ Minorities		2.2	0.0	0
- Participations		-2.4	-2.8	-2.781
Enterprise Value		**4,073.1**	**944.4**	**2,068.2**
2022/23e	Sales	1671.0	1574.7	1574.7
	EBITDA	319.0	288.4	288.4
	EBIT	283.0	246.4	246.4
	Margin	*16.9%*	*15.6%*	*15.6%*
	Net profit	196.7	185.4	185.4
	EV/Sales	2.4	0.6	1.3
	EV/EBITDA	12.8	3.3	7.2
	EV/EBIT	14.4	3.8	8.4
	PE	22.1	6.2	12.2
2023/24e	Sales	1759.6	1597.1	1597.1
	EBITDA	319.3	174.5	174.5
	EBIT	279.8	132.7	132.7
	Margin	*15.9%*	*8.3%*	*8.3%*
	Net profit	209.8	96.7	96.7
	EV/Sales	2.3	0.6	1.4
	EV/EBITDA	12.8	5.4	13.0
	EV/EBIT	14.6	7.1	15.6
	PE	20.7	11.8	23.5
2027/28e	Sales	2685	1,847.0	1,847.0
	EBITDA	513.5	470.7	470.7
	EBIT	443.0	325.1	325.1
	Margin	*16.5%*	*17.6%*	*17.6%*
	Net profit	332.3	234.8	234.8
	EV/Sales	1.5	0.5	1.1
	EV/EBITDA	7.9	2.0	4.4
	EV/EBIT	9.2	2.9	6.4
	PE	13.1	4.9	9.7

Source: Matelan Research, share price in EUR as of 07/10/2022, n EURm except for multiples. CropEnergies' financial year ends at the end of February, Verbio' at the end of July.

… supports the DCF model

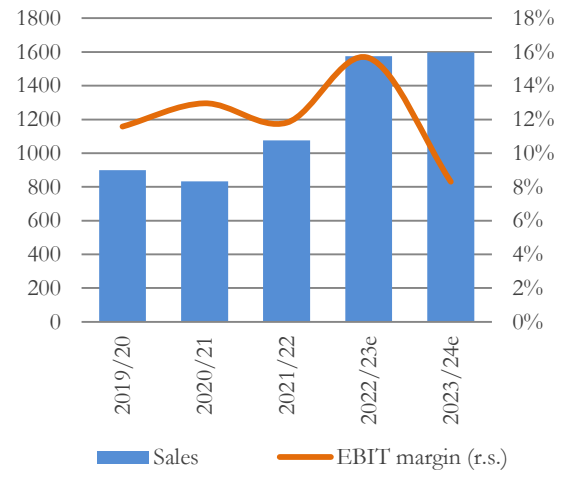
Looking at the comparison of multiples, it should be kept in mind that earnings in 2022/23 are extraordinarily high at CropEnergies while Verbio had this in its past financial year due to a slightly different financial year. Thus, it makes more sense to look at the year 2023/24 where we expect more normalised earnings for both companies. Based on the current share price,

CropEnergies appears to be valued significantly cheaper than Verbio. Based on our fair value, we find multiples coming close to Verbio's level. In 2027/28, the gap widens again, suggesting that our valuation of CropEnergies has some further upside, in particular if the company follows up with a second investment phase.

Risk factors to our valuation

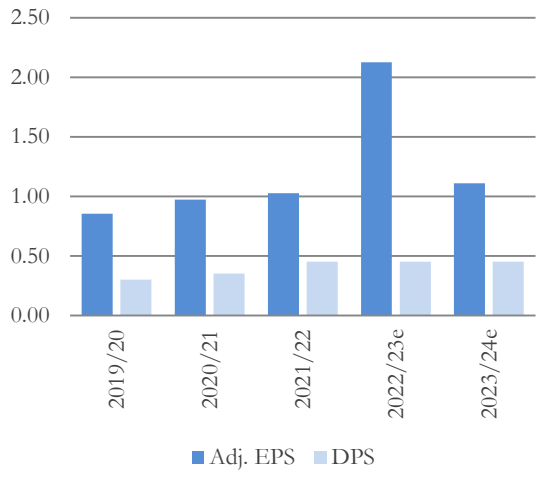
It needs to be highlighted that our estimates are based on the existing regulatory environment as described in the market section of this report. Though there is a general political will to increase the share of renewable energies further, political decisions in individual countries can always lead to temporary imbalances in the market and biofuel prices as well as feedstock prices in general tend to be volatile. Factors such as new capacities, imports or extreme harvests can lead to a widening or narrowing of the spreads, and thus have an influence on margins. Moreover, with regard to the expansion in new markets, final investment decisions still have to be taken, site construction could be subject to delays and the pricing of the new products is not yet fixed. However, all these factors are typical business risks and we believe that the scenario described here is a decent reflection of the trends that can currently be observed in the market. Most importantly CropEnergies' flexibility with regard to its expansion projects makes us confident that the company can reach our estimates.

Sales and EBIT margin



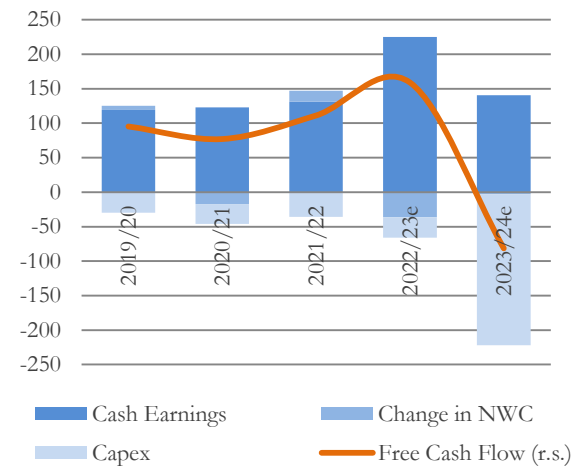
In EURm

Adj. EPS and DPS



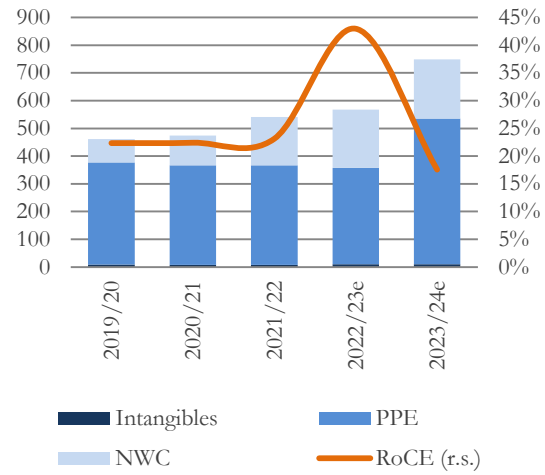
In EUR

Cash Flow



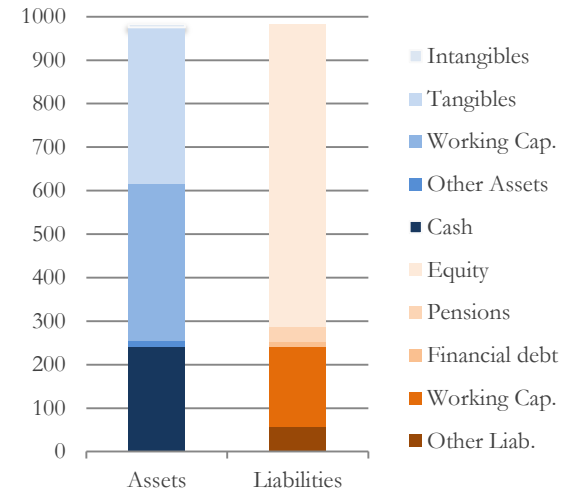
In EURm

RoCE



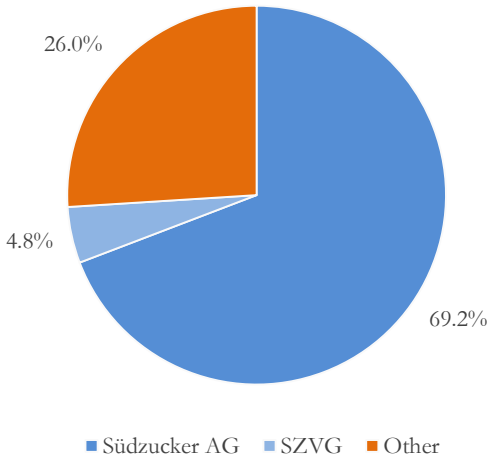
In EURm

Balance Sheet



In EURm

Shareholder structure



P & L

EURm	2019/20	2020/21	2021/22	2022/23e	2023/24e
Sales	**899.2**	**833.1**	**1,075.3**	**1,574.7**	**1,597.1**
Growth		*-7.3%*	*29.1%*	*46.4%*	*1.4%*
Material costs	-660.5	-594.2	-816.2	-1,181.1	-1,312.6
Gross profit	**238.7**	**238.9**	**259.2**	**393.6**	**284.5**
Gross margin	*26.5%*	*28.7%*	*24.1%*	*25.0%*	*17.8%*
Other operating costs	-92.3	-89.6	-90.4	-105.2	-110.0
EBITDA	**146.3**	**149.3**	**168.8**	**288.4**	**174.5**
Margin	*16.3%*	*17.9%*	*15.7%*	*18.3%*	*10.9%*
Depreciation	-42.2	-41.4	-41.8	-42.0	-41.8
EBIT	**104.1**	**107.9**	**127.0**	**246.4**	**132.7**
Margin	*11.6%*	*13.0%*	*11.8%*	*15.6%*	*8.3%*
Financial result	-3.3	-0.5	-2.7	2.3	-2.0
EBT	**100.7**	**107.4**	**124.2**	**248.7**	**130.7**
Taxes	-26.2	-22.5	-34.8	-63.3	-34.0
Net profit	74.6	84.9	89.4	185.4	96.7
Minorities	0.0	0.0	0.0	0.0	0.0
Net profit a.m.	**74.6**	**84.9**	**89.4**	**185.4**	**96.7**
Growth		*13.9%*	*5.3%*	*107.3%*	*-47.8%*
No of shares	87.3	87.3	87.3	87.3	87.3
EPS	0.85	0.97	1.02	2.12	1.11
Adj. EPS	**0.85**	**0.97**	**1.02**	**2.12**	**1.11**
Growth		*13.9%*	*5.3%*	*107.3%*	*-47.8%*
Dividend	0.30	0.35	0.45	0.45	0.45

Balance Sheet

EURm	2019/20	2020/21	2021/22	2022/23e	2023/24e
Intangible assets	8.3	7.9	7.5	9.5	10.5
Tangible assets	369.3	358.7	359.7	347.7	524.9
Participations	2.3	2.5	2.8	3.7	3.7
Other non-current assets	4.8	7.3	7.9	6.2	7.2
Non-current assets	**384.7**	**376.4**	**377.9**	**367.1**	**546.3**
Inventories	66.6	73.2	108.0	120.0	121.7
Receivables	94.6	126.5	251.5	300.0	304.3
Cash	116.9	164.7	241.5	360.0	340.0
Other current assets	7.0	1.7	3.9	4.0	4.0
Current Assets	**285.0**	**366.1**	**604.9**	**784.0**	**770.0**
Total assets	**669.6**	**742.4**	**982.7**	**1,151.1**	**1,316.3**
Equity	502.9	566.1	696.4	842.5	900.0
Minorities	0.0	0.0	0.0	0.0	0.0
Total equity	**502.9**	**566.1**	**696.4**	**842.5**	**900.0**
LT financial liabilities	6.3	5.9	7.0	7.0	107.0
Pension provisions	35.0	30.7	32.4	21.0	22.0
OtherLT liabilities	24.2	24.7	30.8	37.0	38.0
Non-current liabilities	**65.5**	**61.4**	**70.1**	**65.0**	**167.0**
ST financial liabilities	3.2	4.2	4.6	6.6	7.6
Payables	77.6	91.8	185.5	210.0	213.0
Other ST liabilities	20.4	18.9	26.2	27.0	28.8
Current liabilities	**101.3**	**114.9**	**216.2**	**243.6**	**249.4**
Total liabilities	**669.6**	**742.4**	**982.7**	**1,151.1**	**1,316.3**

Cash Flow

EURm	2019/20	2020/21	2021/22	2022/23e	2023/24e
EBIT	**104.1**	**107.9**	**127.0**	**246.4**	**132.7**
Depreciation	42.2	41.4	41.8	42.0	41.8
Other non-cash items	-0.8	-3.8	-2.8	0.0	0.0
Cash taxes	-26.2	-22.5	-34.8	-63.3	-34.0
Cash earnings	**119.4**	**123.0**	**131.2**	**225.1**	**140.5**
Change in NWC	5.7	-17.1	15.8	-36.0	-3.0
CF from operations	**125.1**	**105.9**	**147.0**	**189.0**	**137.5**
Capex	-29.9	-28.8	-35.8	-30.0	-219.0
Other investm./divestm.	0.1	1.3	0.8	0.0	0.0
CF from investing	**-29.8**	**-27.5**	**-34.9**	**-30.0**	**-219.0**
CF from fin. and other	**-15.3**	**-30.5**	**-35.3**	**-40.5**	**61.5**
Change in cash	**80.0**	**47.9**	**76.8**	**118.5**	**-20.0**

Segments and adjusted earnings

EURm	2019/20	2020/21	2021/22	2022/23e	2023/24e
Bioethanol	696.5	647.6	836.9	1,285.1	1,291.0
Growth		*-7.0%*	*29.2%*	*53.5%*	*0.5%*
Food & Feed	192.5	175.5	223.8	274.8	291.1
Growth		*-8.8%*	*27.5%*	*22.8%*	*5.9%*
Other	10.2	10.0	14.6	14.8	15.0
Growth		*-1.8%*	*46.0%*	*1.2%*	*1.4%*
Sales	**899.2**	**833.1**	**1,075.3**	**1,574.7**	**1,597.1**
Growth		*-7.3%*	*29.1%*	*46.4%*	*1.4%*

Valuation multiples

	2019/20	2020/21	2021/22	2022/23e	2023/24e
Share price	7.04	10.82	11.18	13.12	13.12
x No of shares	87.3	87.3	87.3	87.3	87.3
Market Capitalisation	**614.2**	**944.0**	**975.5**	**1,144.7**	**1,144.7**
+ Net financial debt	-107.3	-154.6	-229.9	-346.4	-225.4
+ Pension provision	35.0	30.7	32.4	21.0	22.0
+ Minorities	0.0	0.0	0.0	0.0	0.0
- Participations	-2.3	-2.5	-2.8	-3.7	-3.7
Enterprise Value	**539.7**	**817.6**	**775.1**	**815.6**	**937.6**
Sales	899.2	833.1	1,075.3	1,574.7	1,597.1
Adj. EBITDA	146.3	149.3	168.8	288.4	174.5
Adj. EBIT	104.1	107.9	127.0	246.4	132.7
Adj. Net profit a.m.	74.6	84.9	89.4	185.4	96.7
EV / Sales	0.6	1.0	0.7	0.5	0.6
EV / EBITDA	3.7	5.5	4.6	2.8	5.4
EV / EBIT	5.2	7.6	6.1	3.3	7.1
PE	8.2	11.1	10.9	6.2	11.8

Key operational indicators

	2019/20	2020/21	2021/22	2022/23e	2023/24e
Equity ratio	75.1%	76.3%	70.9%	73.2%	68.4%
Gearing	0.0	0.0	0.0	0.0	0.1
Asset turnover	2.4	2.2	2.9	4.3	2.9
NWC / sales	9.3%	12.9%	16.2%	13.3%	13.3%
Payable days outst.	31.5	40.2	63.0	48.7	48.7
Receivable days outst.	38.4	55.4	85.4	69.5	69.5
Fix operating assets	382.4	373.8	375.1	363.4	542.6
NWC	83.5	107.8	174.0	210.0	213.0
Capital employed	465.9	481.6	549.1	573.4	755.6
RoE	14.8%	15.0%	12.8%	22.0%	10.7%
RoA	15.5%	14.5%	12.9%	21.4%	10.1%
RoCE	22.3%	22.4%	23.1%	43.0%	17.6%
Gross margin	26.5%	28.7%	24.1%	25.0%	17.8%
EBITDA margin	16.3%	17.9%	15.7%	18.3%	10.9%
EBIT margin	11.6%	13.0%	11.8%	15.6%	8.3%
Net profit margin	8.3%	10.2%	8.3%	11.8%	6.1%

Source: Matelan Research

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CropEnergies	
Date	Rating
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18/06/20	Buy
17/12/19	Neutral
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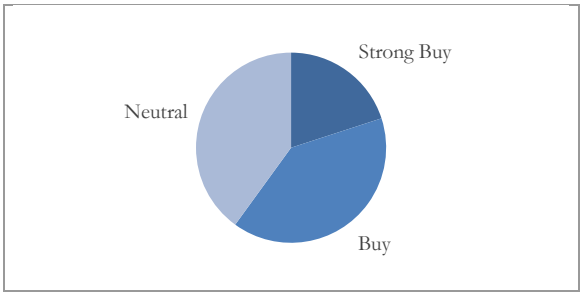

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