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Biofuels trading hubs of the future

The Langham Shanghai, Xintiandi, China

John Houghton-Brown
7-9 May 2019

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Agenda

- About Argus Biofuels
- Global supply and demand, new biodiesel hubs emerge
- EU mandates drive appetite for low-carbon biofuels
- New plant projects to drive trade of feedstocks
- European imports and local price developments
- Argus’ role in price transparency and facilitating liquidity
- Concluding thoughts

The Argus view

- One of the world’s leading PRAs, Argus is a team of nearly 1,000 staff members in 22 global offices
- Publishing more than 21,000 daily spot and forward price assessments, plus market intelligence for world commodities markets
- Coverage includes:
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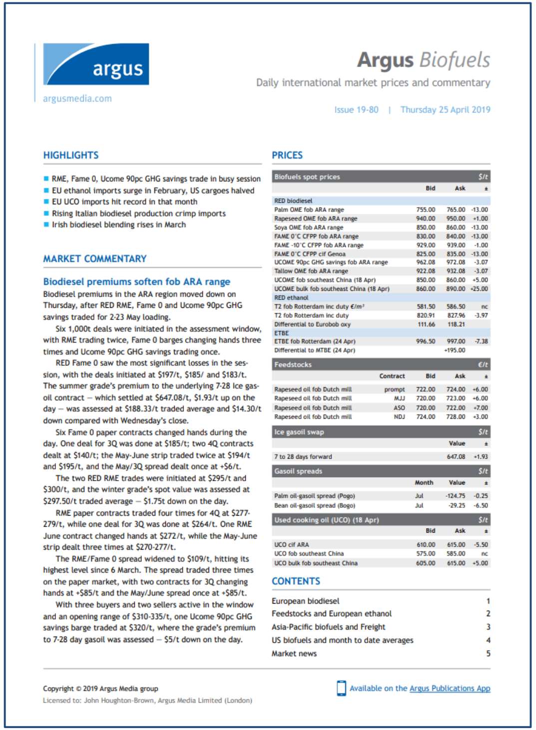
Argus Biofuels – the biofuels industry benchmark

- Daily global publication
- European benchmarks Fame 0, RME
- Specialised Ucome 90pc GHG savings
- Daily T2 ethanol price
- Biofuels tickets prices and analysis
- Crop and non-crop feedstock coverage
- Insightful regulatory news
- Extensive data and downloads



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Argus *Biofuels*

Daily international market prices and commentary

Issue 19-80 | Thursday 25 April 2019

HIGHLIGHTS

- RME, Fame 0, Ucome 90pc GHG savings trade in busy session
- EU ethanol imports surge in February, US cargoes halved
- EU UCO imports hit record in that month
- Rising Italian biodiesel production crimp imports
- Irish biodiesel blending rises in March

MARKET COMMENTARY

Biodiesel premiums soften fob ARA range

Biodiesel premiums in the ARA region moved down on Thursday, after RED RME, Fame 0 and Ucome 90pc GHG savings traded for 2-23 May loading.

Six 1,000t deals were initiated in the assessment window, with RME trading twice, Fame 0 barges changing hands three times and Ucome 90pc GHG savings trading once.

RED Fame 0 saw the most significant losses in the session, with the deals initiated at $197/t, $185/ and $183/t. The summer grade's premium to the underlying 7-28 Ice gasoil contract — which settled at $647.08/t, $1.93/t up on the day — was assessed at $188.33/t traded average and $14.30/t down compared with Wednesday's close.

Six Fame 0 paper contracts changed hands during the day. One deal for 3Q was done at $185/t; two 4Q contracts dealt at $140/t; the May-June strip traded twice at $194/t and $195/t, and the May/3Q spread dealt once at +$6/t.

The two RED RME trades were initiated at $295/t and $300/t, and the winter grade's spot value was assessed at $297.50/t traded average — $1.75t down on the day.

RME paper contracts traded four times for 4Q at $277-279/t, while one deal for 3Q was done at $264/t. One RME June contract changed hands at $272/t, while the May-June strip dealt three times at $270-277/t.

The RME/Fame 0 spread widened to $109/t, hitting its highest level since 6 March. The spread traded three times on the paper market, with two contracts for 3Q changing hands at +$85/t and the May/June spread once at +$85/t.

With three buyers and two sellers active in the window and an opening range of $310-335/t, one Ucome 90pc GHG savings barge traded at $320/t, where the grade's premium to 7-28 day gasoil was assessed — $5/t down on the day.

PRICES

Biofuels spot prices	Bid	Ask	±
RED biodiesel			
Palm OME fob ARA range	755.00	765.00	-13.00
Rapeseed OME fob ARA range	940.00	950.00	+1.00
Soya OME fob ARA range	850.00	860.00	-13.00
FAME 0°C CFPP fob ARA range	830.00	840.00	-13.00
FAME -10°C CFPP fob ARA range	929.00	939.00	-1.00
FAME 0°C CFPP cif Genoa	825.00	835.00	-13.00
UCOME 90pc GHG savings fob ARA range	962.08	972.08	-3.07
Tallow OME fob ARA range	922.08	932.08	-3.07
UCOME fob southeast China (18 Apr)	850.00	860.00	+5.00
UCOME bulk fob southeast China (18 Apr)	860.00	890.00	+25.00
RED ethanol			
T2 fob Rotterdam inc duty €/m³	581.50	586.50	nc
T2 fob Rotterdam inc duty	820.91	827.96	-3.97
Differential to Eurobob oxy	111.66	118.21	
ETBE			
ETBE fob Rotterdam (24 Apr)	996.50	997.00	-7.38
Differential to MTBE (24 Apr)		+195.00	

$/t

Feedstocks	Contract	Bid	Ask	±
Rapeseed oil fob Dutch mill	prompt	722.00	724.00	+6.00
Rapeseed oil fob Dutch mill	MJJ	720.00	723.00	+6.00
Rapeseed oil fob Dutch mill	ASO	720.00	722.00	+7.00
Rapeseed oil fob Dutch mill	NDJ	724.00	728.00	+3.00

€/t

Ice gasoil swap	Value	±
7 to 28 days forward	647.08	+1.93

$/t

Gasoil spreads	Month	Value	±
Palm oil-gasoil spread (Pogo)	Jul	-124.75	-0.25
Bean oil-gasoil spread (Bogo)	Jul	-29.25	-6.50

$/t

Used cooking oil (UCO) (18 Apr)	Bid	Ask	±
UCO cif ARA	610.00	615.00	-5.50
UCO fob southeast China	575.00	585.00	nc
UCO bulk fob southeast China	605.00	615.00	+5.00

$/t

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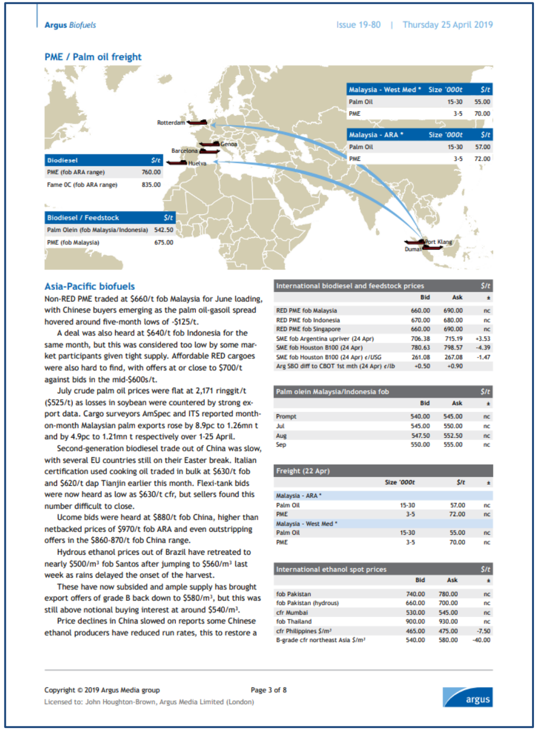


PME / Palm oil freight

Malaysia - West Med *	Size '000t	$/t
Palm Oil	15-30	55.00
PME	3-5	70.00

Malaysia - ARA *	Size '000t	$/t
Palm Oil	15-30	57.00
PME	3-5	72.00

Biodiesel	$/t
PME (fob ARA range)	760.00
Fame 0C (fob ARA range)	835.00

Biodiesel / Feedstock	$/t
Palm Olein (fob Malaysia/Indonesia)	542.50
PME (fob Malaysia)	675.00

Asia-Pacific biofuels

Non-RED PME traded at $660/t fob Malaysia for June loading, with Chinese buyers emerging as the palm oil-gasoil spread hovered around five-month lows of -$125/t.

A deal was also heard at $640/t fob Indonesia for the same month, but this was considered too low by some market participants given tight supply. Affordable RED cargoes were also hard to find, with offers at or close to $700/t against bids in the mid-$600s/t.

July crude palm oil prices were flat at 2,171 ringgit/t ($525/t) as losses in soybean were countered by strong export data. Cargo surveyors AmSpec and ITS reported month-on-month Malaysian palm exports rose by 8.9pc to 1.26mn t and by 4.9pc to 1.21mn t respectively over 1-25 April.

Second-generation biodiesel trade out of China was slow, with several EU countries still on their Easter break. Italian certification used cooking oil traded in bulk at $630/t fob and $620/t dap Tianjin earlier this month. Flexi-tank bids were now heard as low as $630/t cfr, but sellers found this number difficult to close.

Ucome bids were heard at $880/t fob China, higher than netbacked prices of $970/t fob ARA and even outstripping offers in the $860-870/t fob China range.

Hydrous ethanol prices out of Brazil have retreated to nearly $500/m³ fob Santos after jumping to $560/m³ last week as rains delayed the onset of the harvest.

These have now subsided and ample supply has brought export offers of grade B back down to $580/m³, but this was still above notional buying interest at around $540/m³.

Price declines in China slowed on reports some Chinese ethanol producers have reduced run rates, this to restore a

International biodiesel and feedstock prices	Bid	Ask	±
RED PME fob Malaysia	660.00	690.00	nc
RED PME fob Indonesia	670.00	680.00	nc
RED PME fob Singapore	660.00	690.00	nc
SME fob Argentina upriver (24 Apr)	706.38	715.19	+3.53
SME fob Houston B100 (24 Apr)	780.63	798.57	-4.39
SME fob Houston B100 (24 Apr) ¢/USG	261.08	267.08	-1.47
Arg SBO diff to CBOT 1st mth (24 Apr) ¢/lb	+0.50	+0.90	

$/t

Palm olein Malaysia/Indonesia fob	Bid	Ask	±
Prompt	540.00	545.00	nc
Jul	545.00	550.00	nc
Aug	547.50	552.50	nc
Sep	550.00	555.00	nc

$/t

Freight (22 Apr)	Size '000t	$/t	±
Malaysia - ARA *			
Palm Oil	15-30	57.00	nc
PME	3-5	72.00	nc
Malaysia - West Med *			
Palm Oil	15-30	55.00	nc
PME	3-5	70.00	nc

International ethanol spot prices	Bid	Ask	±
fob Pakistan	740.00	780.00	nc
fob Pakistan (hydrous)	660.00	700.00	nc
cfr Mumbai	530.00	545.00	nc
fob Thailand	900.00	930.00	nc
cfr Philippines $/m³	465.00	475.00	-7.50
B-grade cfr northeast Asia $/m³	540.00	580.00	-40.00

$/t

Global gains in supply and demand

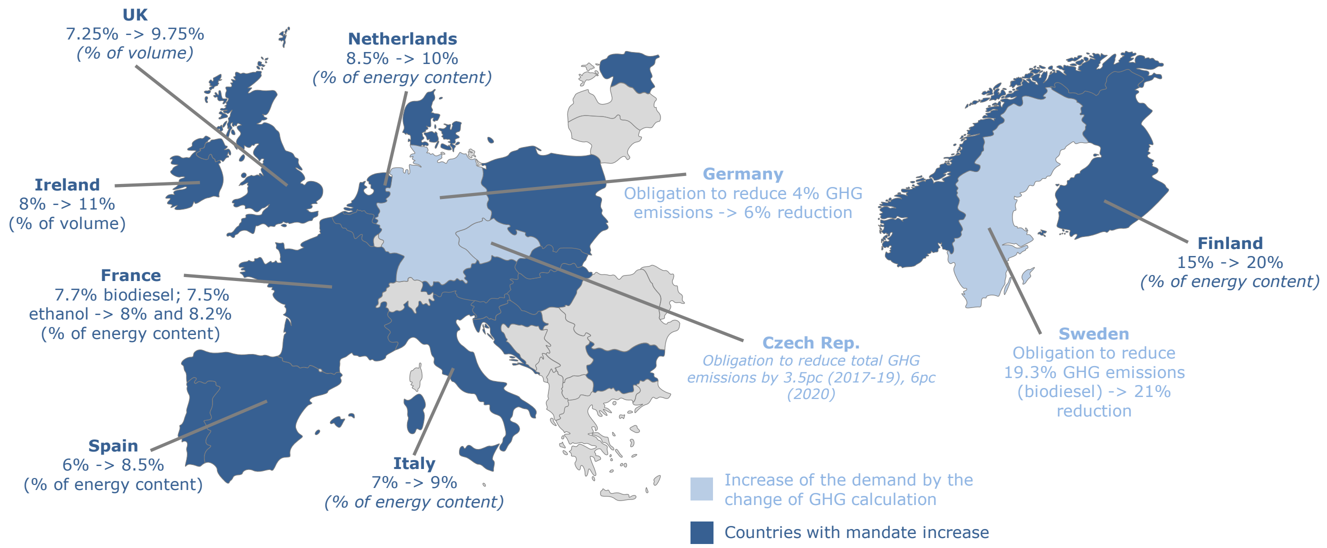
- Global biodiesel production was around 31mn t/yr in 2018
- Hydrotreated vegetable oil (HVO) capacity around 5mn t/yr
- HVO production to increase to 7mn t/yr in 2020-21
- Asia-Pacific output growth to meet internal and external demand
- China is world’s largest regional increment in transport energy use

EU mandates drive appetite for low-carbon biofuels

- EU assumes around 11mn t/yr of biodiesel demand
- Targets 20pc renewables share of final energy consumption by 2020
- Sub-target for the transport sector of 10pc renewables
- Double counting implemented across most member states
- Rising share of biodiesel from used cooking oil (UCO) and tallow
- Waste assumed around 10-15pc of biodiesel feedstock mix in 2018

Biofuels legislation drives consumption

Mandates in the main countries supporting biofuels

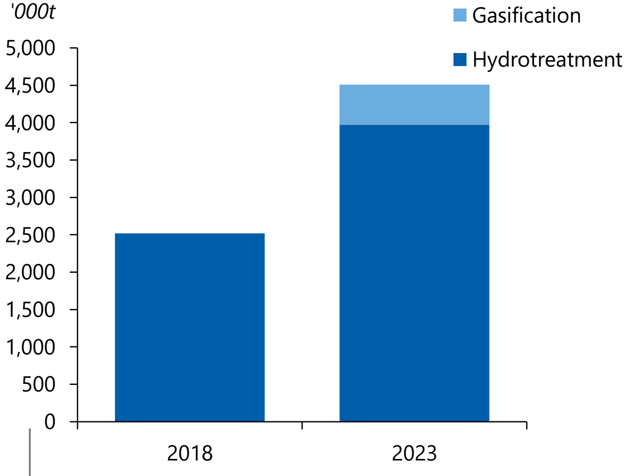


Changes in blending targets from 2018-2020

EU HVO capacity set to rise

- HVO plants typically process a mix of feedstocks, including crop-based and waste-based
- Neste has pioneered but competitors are coming to market; global production is primarily based in Europe, Singapore and the US
- With the expansion of Venice and commissioning of Gela, ENI will own around 25-30pc of renewable diesel production capacity in Europe, but maintenance issues persist
- Co-processing will continue to assume a significant market share

European renewable diesel production capacity



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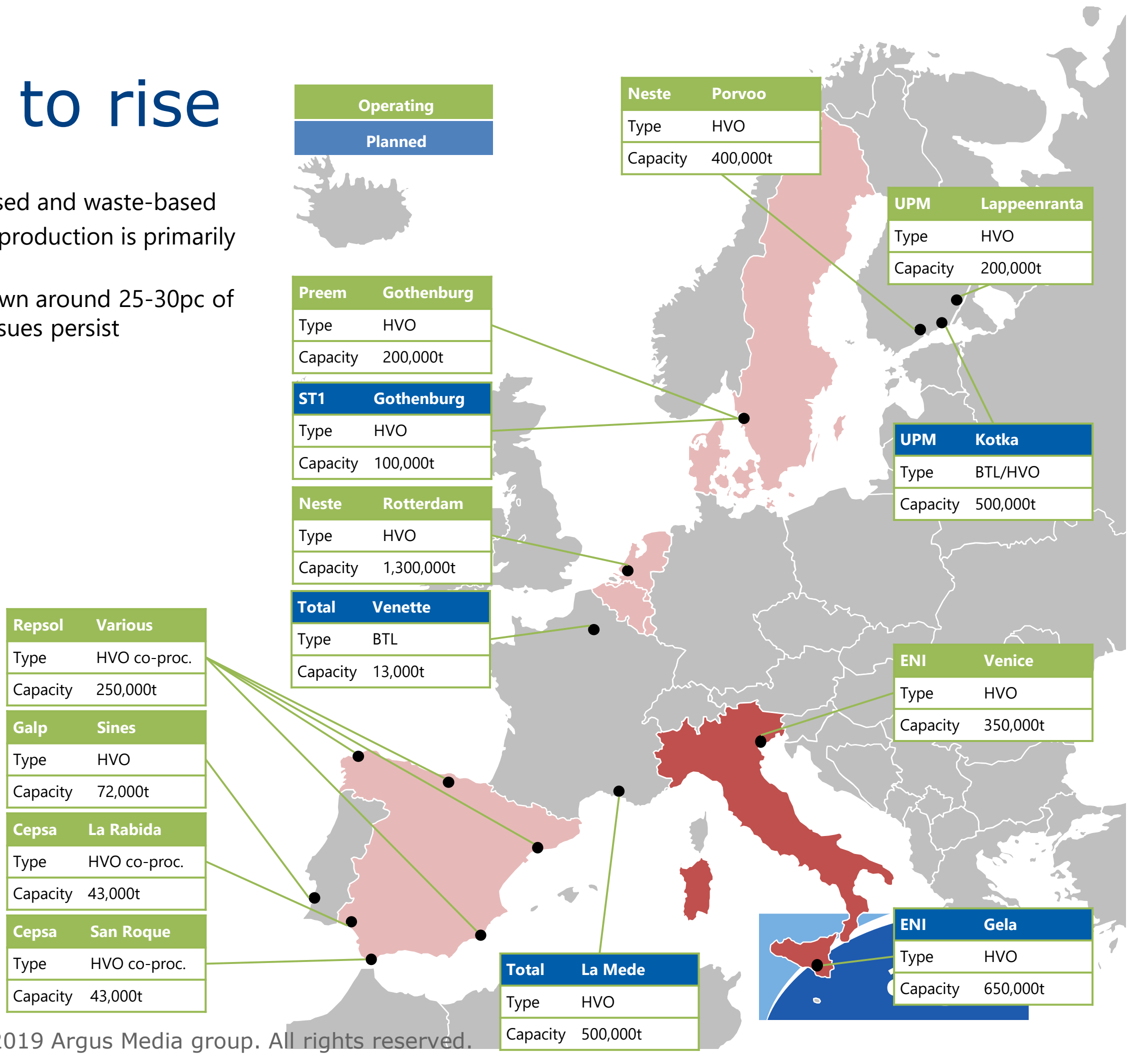


HVO, co-processing relies on imports

- HVO, co-processing technology is not limited to a type of feedstock but can use the most price competitive feedstock

- Low carbon, high quality with growth prospects under RED II

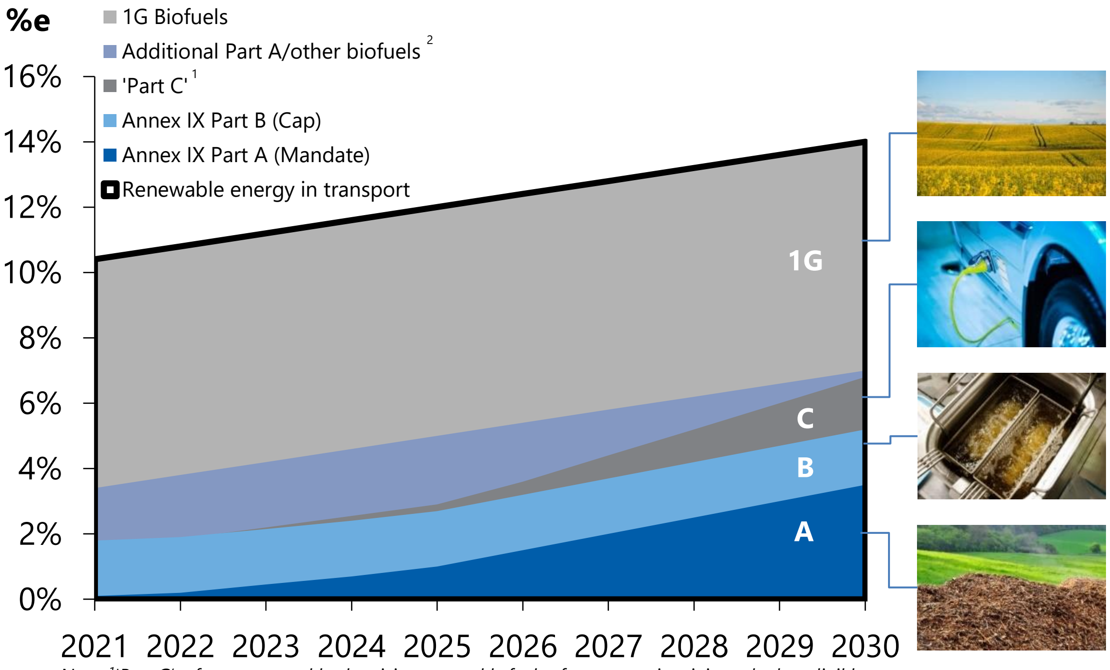
- Types of industries:
  - Specific requirements for aviation, shipping

- Limiting factors:
  - Consumer: preference for waste-based feedstocks
  - Availability: quantities for UCO and tallow are limited to feed the rise in global HVO and co-processing production sites
  - Legislation: EU ban on palm oil

- Pricing difficult as array of feedstocks/specifications, lack of spot market, but trading as premium to ICE gasoil in Europe

RED II overview

Graphical representation of RED II caps and mandates



Note: [1] 'Part C' refers to renewable electricity, renewable fuels of non-organic origin and other eligible fuels'

[2] Area of uncertainty resulting from caps on 1G and Part B biofuels; disappears in double-counted markets as Part B will cover

Key features of RED II

Renewable energy in transport target 14pc by 2030

RED II includes a clause to revise the general 14pc transport target in 2023

Advanced biofuels sub-targets of 0.2pc in 2022, 1pc in 2025 and 3.5pc in 2030

Double-counting for Annex IX Part A / B feedstocks

Part B of Annex IX capped at 1.7pc

First Generation biofuels:

- High ILUC risk frozen at 2020 levels until 2023 + 1pc (max 7pc)
- Low ILUC risk no upper limit
- Review in 2023

Multipliers for: aviation and marine 1.2x; renewable electricity in road transport 4x

RED II framework takeaways

European framework steers biofuels consumption and technologies

- Europe continues to:
  - Safeguard crop-based (first generation) biofuels at current levels (with a cap at 7pc)
  - Safeguard waste-based biofuels from UCO, tallow (levels at 1.7pc), incentivise advanced biofuels (3.5pc), but uncertainty over technologies remains (e.g. Annex IX Part A feedstocks)

- Tariffs and Duties will play role:
  - Countervailing duties on EU imports resolved but palm oil ban by 2030?
  - EU anti-subsidy duties now on Argentinian biodiesel but minimum price undertaking introduced
  - European Commission recognises US soybeans as sustainable feedstock for biofuels production until July 2021

Qualifying feedstocks

Annex IX Part A

- Algae
- Biomass fraction of mixed municipal waste
- Bio-waste from households
- Biomass fraction of industrial waste
- Straw
- Animal manure and sewage sludge
- Palm oil mill effluent and empty palm fruit bunches
- Tall oil pitch
- Crude glycerine
- Bagasse
- Grape marcs and wine lees
- Nut shells
- Husks
- Cobs cleaned of kernels of corn.
- Biomass fraction of wastes and residues from forestry and forest-based industries
- Other non-food cellulosic material
- Other lignocellulosic material
- Renewable liquid and gaseous transport fuels of non-biological origin
- Carbon capture and utilisation for transport purposes
- Bacteria

Annex IX Part B

- Used cooking oil
- Animal fats

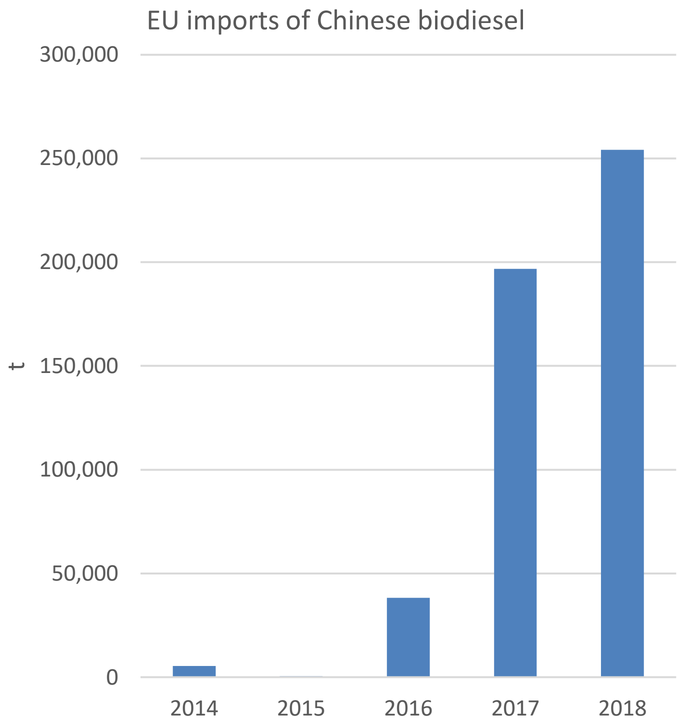
Palm oil ban

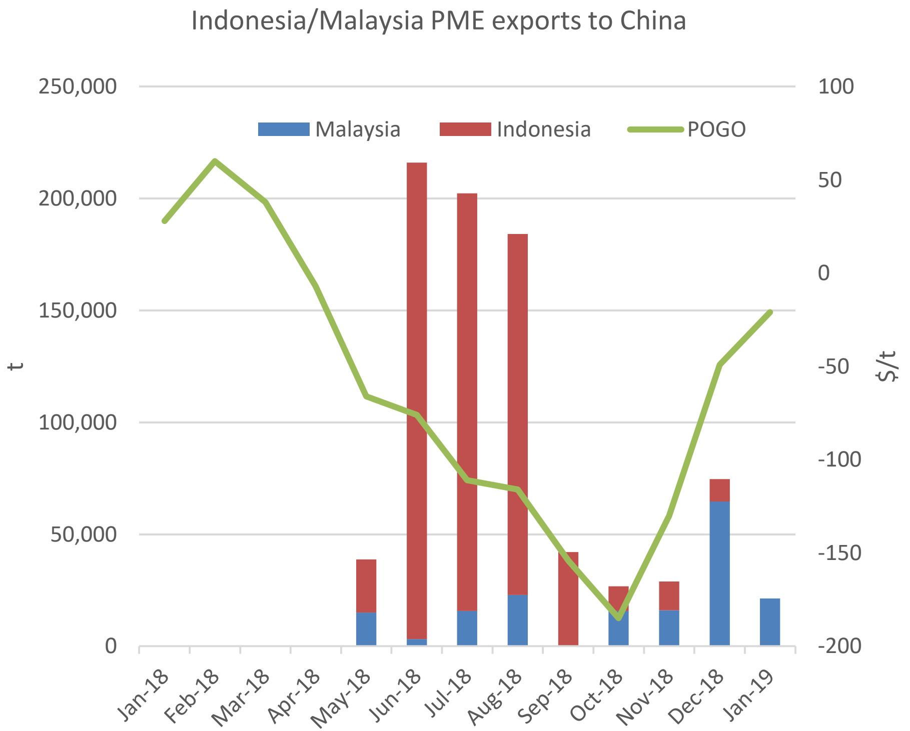
- ✓ European Commission (EC) classified biofuel feedstock from palm oil but not soybean as of high risk of indirect land-use change (ILUC) in areas of high carbon stock
- ✓ High ILUC biofuel feedstocks fall under gradual phase-out by 2030 unless firms can certify sustainable production
- ✓ EC has tightened exemption given for palm oil from smallholders with ownership or lease rights on agricultural land of up to two hectares
- ✓ Also says smallholders must be independent; definition of smallholders modified to exclude "potential abuses from corporations controlling a number of small producers"
- ✓ Following publication on 21 May 2019, the regulation will now enter into force in June

European imports and local price developments

- Imports of Chinese Ucome and feedstock UCO are now commonplace in the EU
- EU reduced anti-dumping duties (ADDs) on Argentinian biodiesel in late 2017
- Removed ADDs on Argentinian and Indonesian product altogether in 2018
- Spot prices in ARA pressured by imports, before logistical issues saw record gains
- Feedstock imports have increased, with higher volumes of vegetable oil arrivals
- Asia-Pacific countries ideally placed to meet global biodiesel demand

EU FAME imports: China





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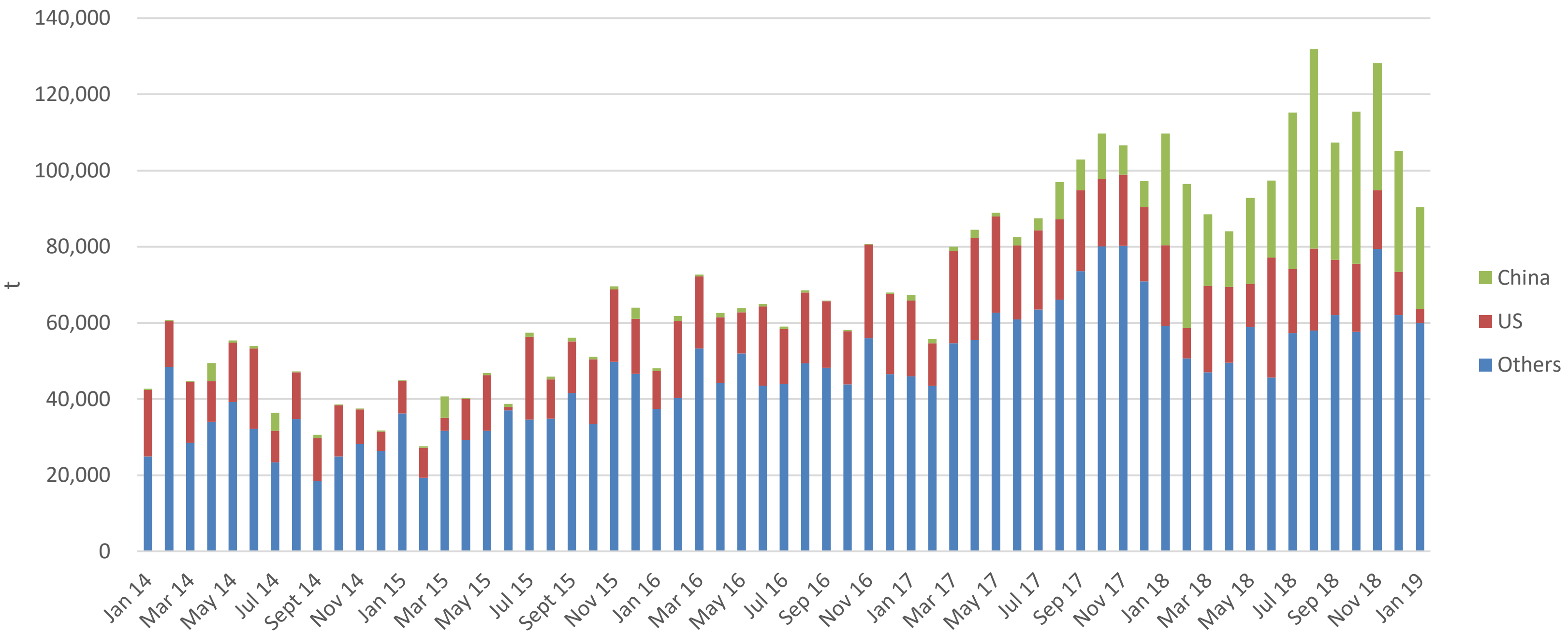
EU UCO imports



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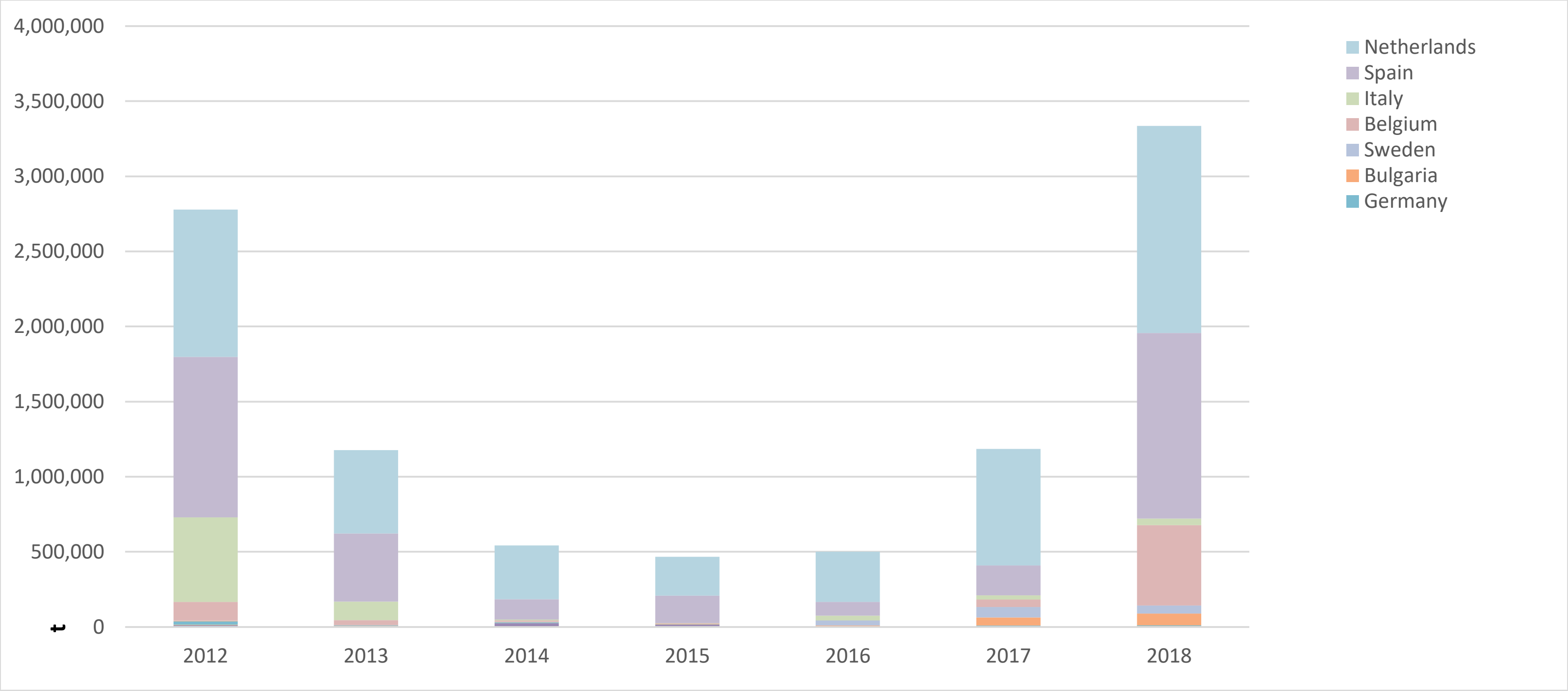
EU FAME imports from the rest of the world



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Fob ARA range benchmark price developments

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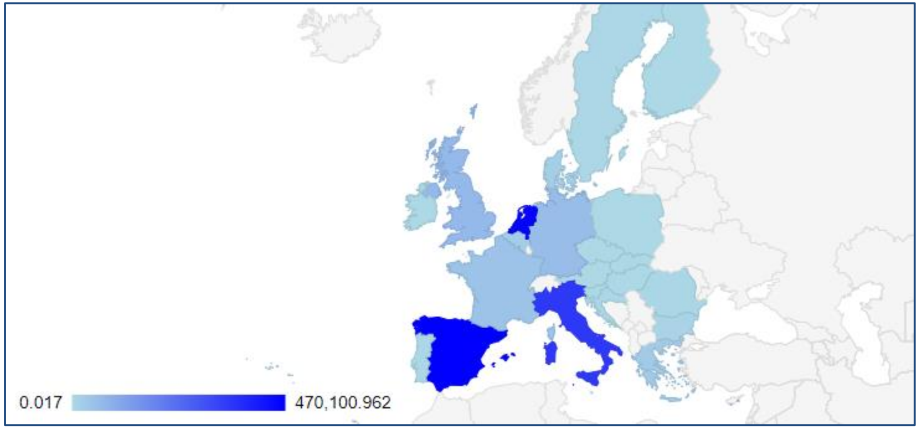
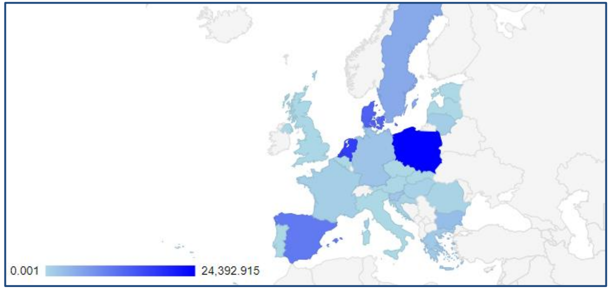
EU vegetable oil feedstock imports

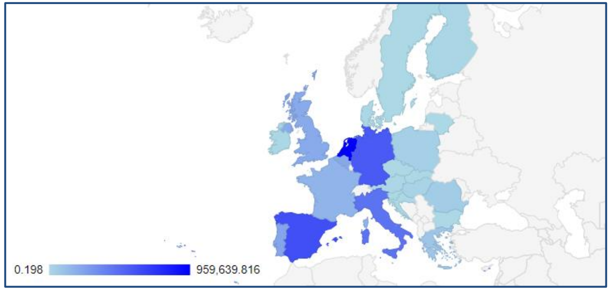
Palm oil 1Q 2019



Soybean oil 1Q 2019



Soybean 1Q 2019



1Q 2019 total palm oil: 1,370,902t

1Q 2018 total palm oil: 1,322,268t

1Q 2019 total soybean oil: 77,319t

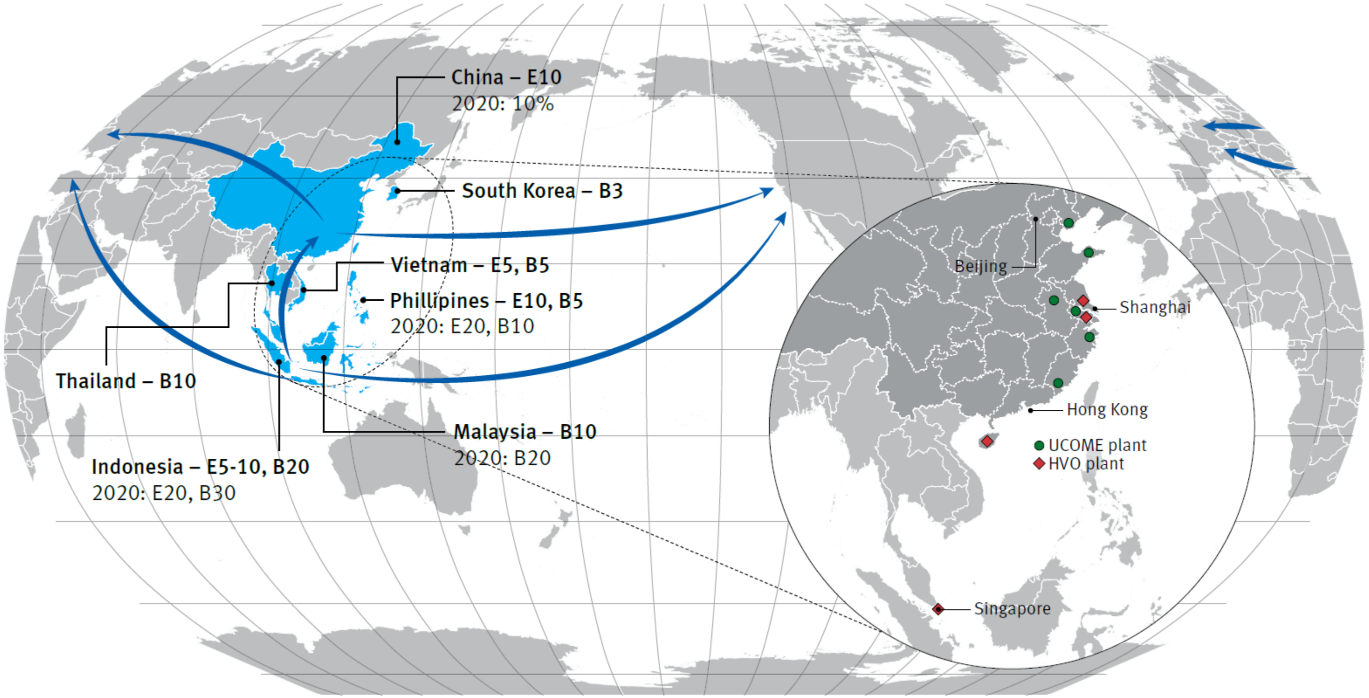
1Q 2018 total soybean oil: 56,889t

1Q 2019 total soybean: 3,291,847t

1Q 2018 total soybean: 3,175,794t

Source: Eurostat, Argus Data Science

Asia-Pacific projects and potential outlets



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Argus’ role in price transparency and facilitating liquidity

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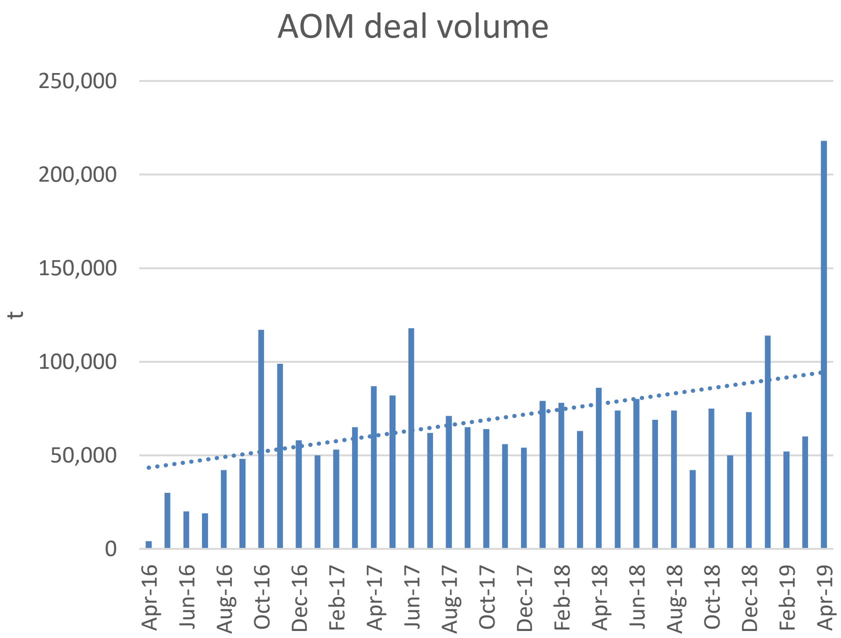
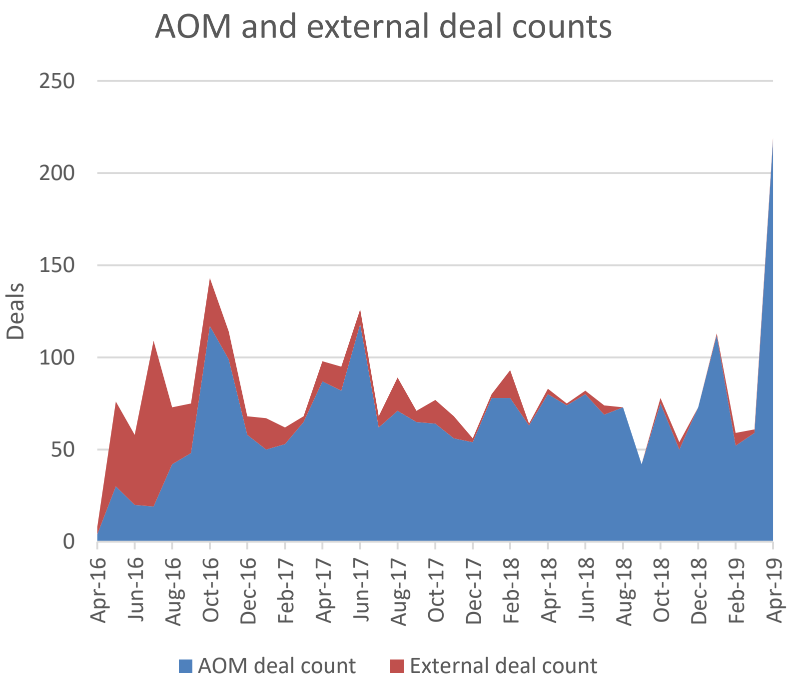
Argus Open Markets

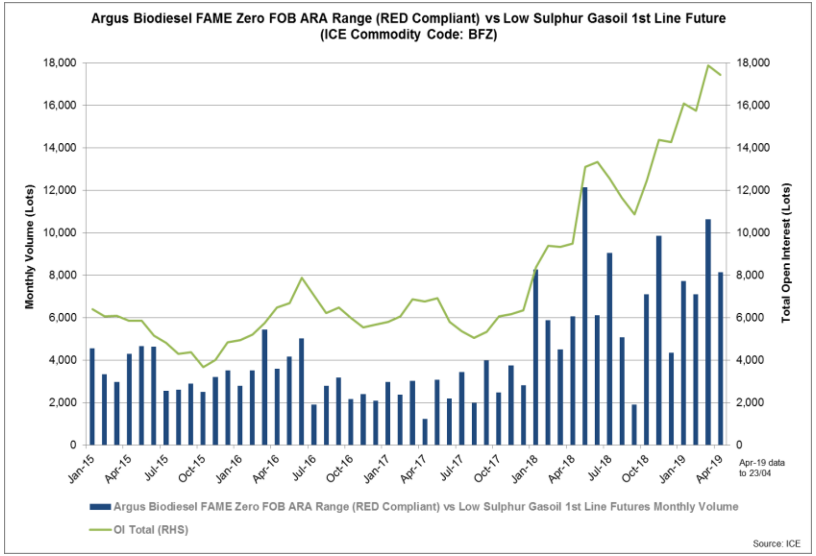
- More transparent price discovery
- Facilitate market participation
- Centralises the biofuels market in one place
- Easier to follow market movements
- Satisfy regulatory requirements & oversight

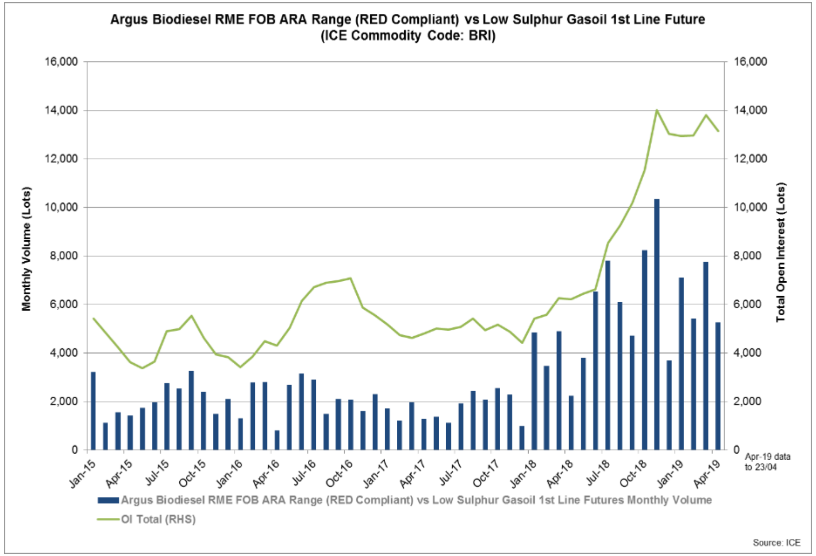
RME and Fame 0 fob ARA range on AOM





Fame 0 and RME open interest



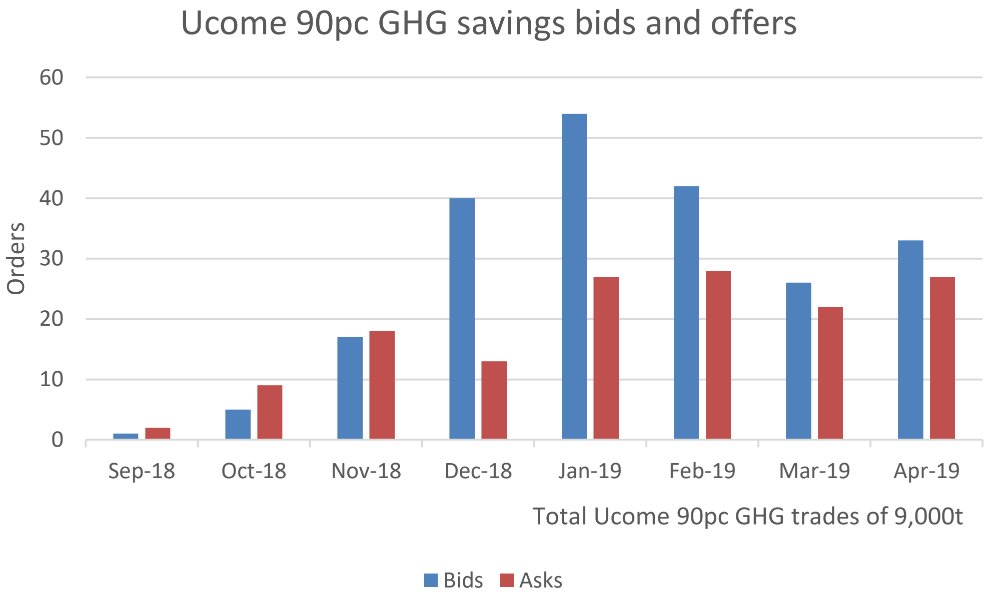


- RED Fame 0 fob ARA range Open Interest as differential to Low Sulphur Gasoil 1st Line Future extends to June 2020
- RED RME fob ARA range Open Interest as differential to Low Sulphur Gasoil 1st Line Future extends to March 2020

(Source: ICE, 30 April)

Ucome 90pc GHG savings on AOM

- New specification launched September 2018
- Replaced Ucome EU price based on broad specifications, methods of trading
- Reflects liquidity in key markets: Must be UK and Netherlands double counting eligible, German mandate compliant
- Assessed as differential to 7-28 day ICE gasoil, $/t



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Key questions for market participants

- Which feedstocks will be permitted by RED II and will this change over the implementation period?
- How will the palm oil ban play out with regards to by-products, e.g. PFAD and POME?
- How might national level implementations of the legislation change the picture?
- Will non-European sources of feedstock further emerge?
- How might technology costs decline over the RED II implementation period?
- Will companies' existing access to feedstock or bio-components meet their future needs?
- What role will duties play on the EU supply-demand dynamic?
- To what extent will Asia-Pacific's increasing appetite for biofuels draw supply away from Europe?

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Our publications

Below are a small sample of our annual and monthly publications covering the bioenergy and fuels markets

Argus Biofuels

International market prices and commentary on biofuels, feedstocks, freight rates and product swaps

Argus Crude and Refined Products

Argus Crude reports daily on the global crude markets. Analysis and pricing for more than 80 different internationally traded crude streams

Argus Americas Biofuels

Focussing on US and South American hydrous and anhydrous ethanol, Soybean biodiesel and other Americas-specific biofuels market data

Argus European Emissions Markets

European greenhouse gas markets, news and analysis related to EU ETS carbon trading

Argus Biomass Markets

Weekly markets news and analysis covering wood pellets,, wood chips, palm kernels shells, at as range of global trading hubs

Argus Ethanol Brazil

Portuguese-language publication specific to Brazilian market supply, demand and pricing across the country’s producing regions

Biofuels legislation drives consumption

European biofuels mandates by country (major producers/consumers)			
Country	**Biofuels mandate 2019 (%)**	**Biofuels mandate 2020 (%)**	**Double counting**
Germany (GHG reduction)	4	6	No
France (by energy)	7.9	8 (biodiesel) 8.2 (ethanol)	Yes
UK (by volume)	8.5	9.75	Yes
Poland (by energy)	8; 5.5 (biodiesel) 3.2 (ethanol)	8.5; 5.7 (biodiesel) 3.2 (ethanol)	Yes
Netherlands (by energy)	9.25	10	Yes
Spain (by energy)	7	8.5	Yes
Italy (by energy)	8	9	Yes

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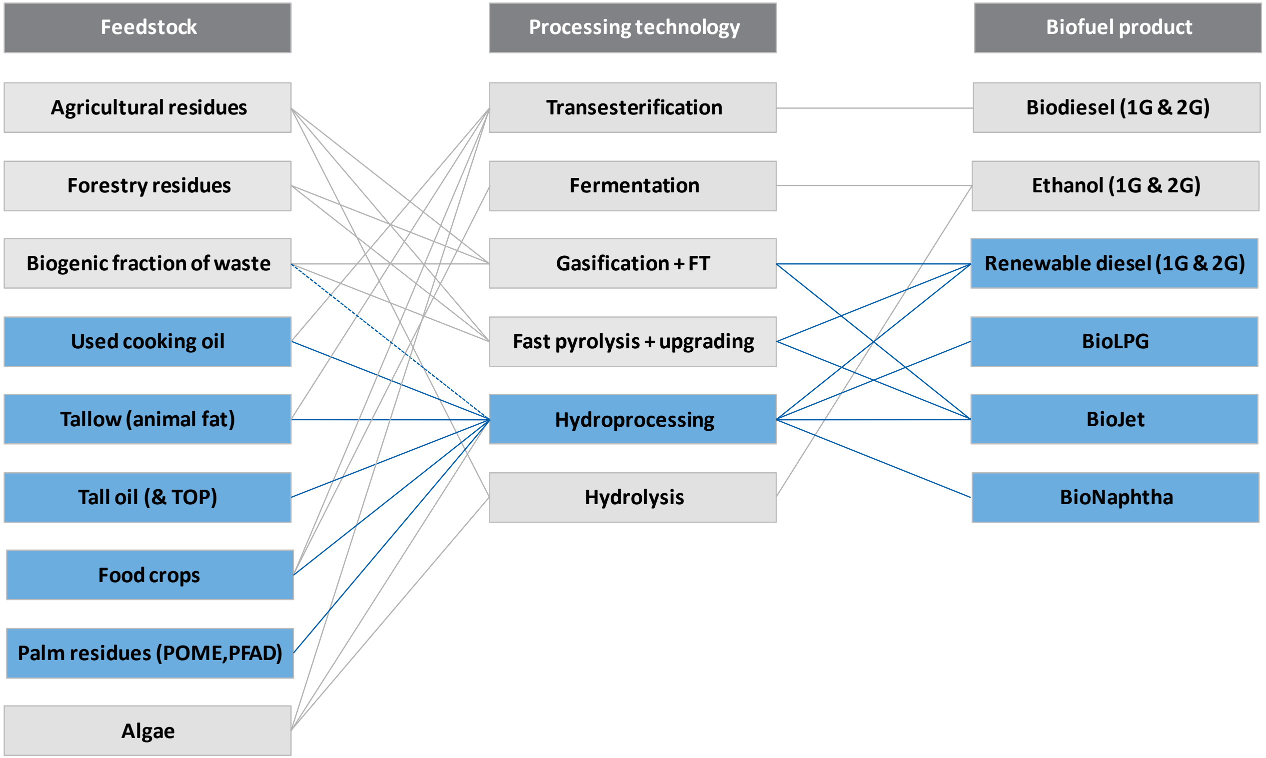
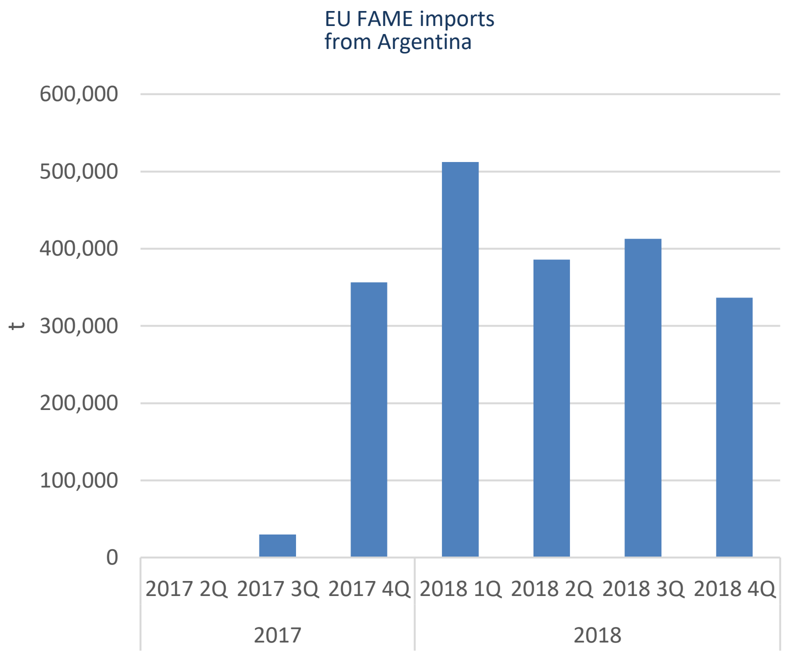
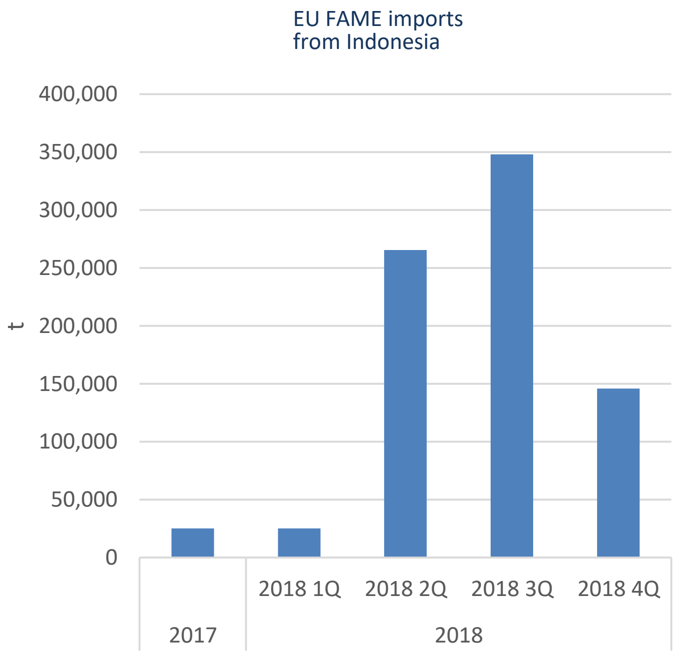
Feedstock conversion pathways



EU FAME imports: Argentina and Indonesia





Example of AOM bid-ask stacks