



INVITATION

Praj cordially invites you to

Biodiesel Workshop '19

which will include an interactive discussion on-

- ◆ Biodiesel market, policies and off take.
- ◆ UCO based biodiesel opportunity extended through RUCO by BDAI.
- ◆ Benchmarking of biodiesel technologies by Novozymes.
- ◆ Feedstock and co-product supply chain management.
- ◆ Statutory compliances.

📍 Praj Matrix (R&D centre)
Urawade, Pune - 412115

📅 Monday, December 02nd, 2019

🕒 9.30 am to 4.00 pm

BIODIESEL WORKSHOP-2019 Itinerary

Topic	Presenter / Speaker	Time
Registration & Breakfast		9.30 am - 10.00 am
Opening Remarks	Mr Shishir Joshipura (CEO & MD, PRAJ)	10.00 am - 11.30 am
Bio Diesel Market, policies & Offtake scenario in India	Mr Santanu Gupta (CGM AE & SD, IOCL)	
UCO based Bio Diesel Opportunity in India	Mr Sandeep Chaturvedi (Chairman BDAI)	
Q & A		
Advanced Biodiesel Technologies	Mr K B Lim (Consultant)	11.30 am - 01.30 pm
Enzymatic Bio Diesel Technology	Mr Denise Tang (Business Manager, Novozymes)	
Praj's Offering in Biodiesel	Dr Mangesh Kulkarni	
Q & A		
Lunch at Praj Matrix R & D Center		01.30 pm - 02.30 pm
Feedstock & Co-product Management	Mr Chetan Sayankar	02.30 pm - 03.45 pm
Statutory Compliances for Bio Diesel	Consultant - Mr Deepak Desai	
Tour to Praj Matrix and Biodiesel Pilot Plant Facility		02:30 pm - 03:30 pm
Closure (Tea & Snacks)		03:30 pm - 04.00 pm

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DELHI'S AIR QUALITY DETERIORATES TO 'HAZARDOUS'



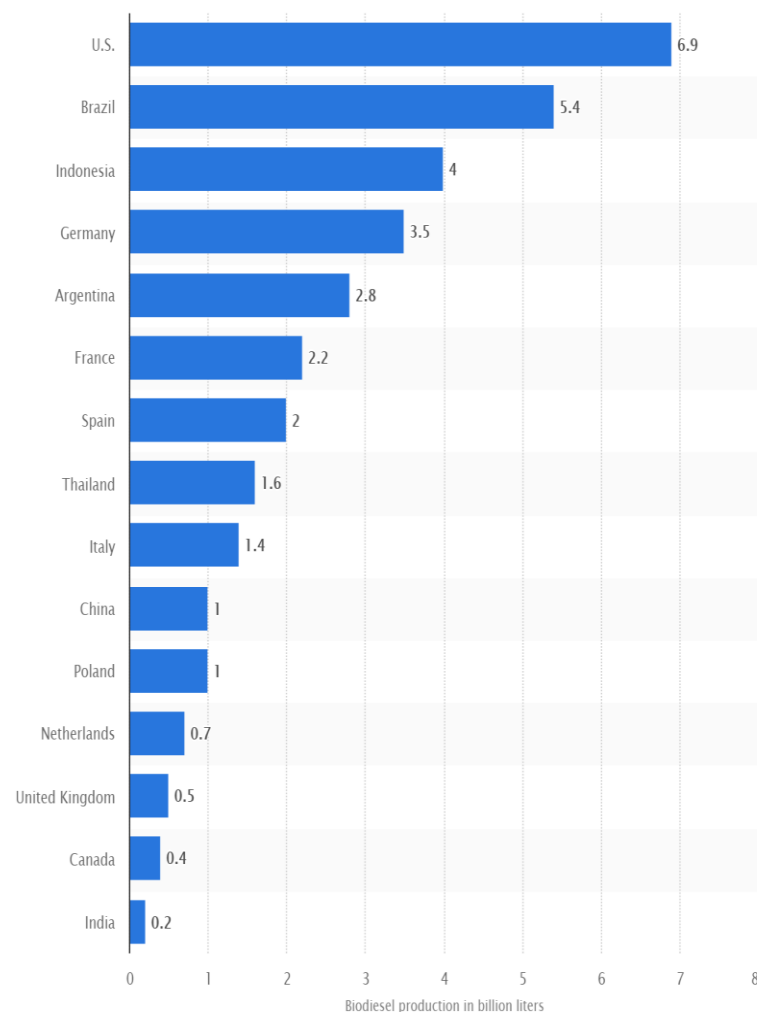
Air Quality Index

0-50 Good 51-100 Satisfactory 101-200 Moderate
201-300 Poor 301-400 Very Poor 401-500 Severe

Days	Delhi	Kolkata	Mumbai	Hyderabad
28 Oct	368	160	104	106
29 Oct	400	219	112	92
30 Oct	419	205	89	93
31 Oct	430	244	76	97
1 Nov	484	231	66	92

Source: National Air Quality Index

Leading biodiesel producers worldwide in 2018, by country (in billion liters)



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SETTINGS

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XLS



PNG



PPT

DESCRIPTION

SOURCE

MORE INFORMATION

by [T. Wang](#),

last edited Nov 26, 2019

This graph shows the world's biggest biodiesel producing countries according to their production volume in 2018. With a production volume of around 2.8 billion liters, Argentina was ranked fifth that year.

Biodiesel in the United States

Biodiesel is generally composed of a chemically reacting lipid, such as a vegetable oil or an animal fat, and an alcohol that produces fatty acid esters. It is meant to be used in normal diesel engines and can be used alone or as a blend with petrodiesel. Some blends of biodiesel can also be used for heating purposes. Using biodiesel can reduce emissions of carbon monoxide, particulates, hydrocarbons, and sulfates. If the fuel is blended, its emissions' reduction depends on the blend's composition. Biodiesel is also able to degrade at a much faster rate than normal diesel fuel.

1) The total diesel market in India is approximately 25 billion gallons per year with 80% imported, of which less than 250 million gallons per year of biodiesel is currently blended. The 2018 National Biofuels Policy stated a plan to increase Biodiesel blending to 5% of the diesel market, equal to more than 1.2 billion gallons per year.

2) Annually, about 23-million-ton cooking oil is consumed in India. There is potential to recover and use about 3 million tones of this for production of bio-diesel



SR. No.	COMPANY NAME	BIO DIESEL PLANT LOCATION	YEAR of establishment	Capacity TPD	Feedstock			
					Animal Fat	PFAD	RBD Palm Stearin	UCO
1	Kaleesuwari Refinery Private Limited	Andhra Pradesh	2008	300	N	Y	Y	Y
2	Bio Max	Andhra Pradesh	2009	450	N	Y	Y	Y
3	Emami Biotech Pvt Ltd	West Bengal	2009	300	N	Y	Y	Y
4	Universal Biofuels	Andhra Pradesh	2008	300	Y	Y	Y	Y
5	Khanda Biofuels Pvt Ltd	Hyderabad	2011	30	Y	N	Y	Y
6	Yantra Fintech Ltd	Chennai	2009	50	N	Y	Y	Y
7	Yamuna Bio Industries Ltd	Varoda	2015	100	N	Y	Y	Y
8	Unicon Fibro Chem Ltd	Silvassa	2015	50	N	Y	Y	Y
9	Rajputana Biofuels Ltd	Jaipur	2018	30	Y	N	Y	Y
10	Kotiar Biofuels Ltd	Abu Road, rajasthan	2019	500	N	N	Y	Y
11	Wash well	Bhilwara	2015	30	Y	Y	Y	Y
12	Kissan Agro Industries Ltd	Noida	2012	100	Y	Y	Y	Y
13	Monopoly Industries Ltd	Khopoli	2018	50	N	N	Y	Y
14	Green Fuels Pvt. Ltd	Bangalore	2012	10	N	N	Y	Y
15	BioD Industries Ltd	Bawal, Haryana	2019	100	Y	Y	Y	Y
16	Global	Panvel	2015	10	Y	Y	Y	Y
17	Al Noor	Muzaffarnagar	2015	10	Y	Y	Y	Y
18	Elite Oil Ltd	Kakinada	2018	50	Y	Y	Y	Y
19	Southern Biotech Ltd	Andhra Pradesh	2007	200	Y	Y	Y	Y
20	Southern Biotech Ltd	Andhra Pradesh	2010	30	Y	Y	Y	Y
21	Nova Biofuels P Ltd	Haryana	2008	30	Y	Y	Y	Y
22	Costal Energy	West Bengal	2008	100	N	Y	Y	Y
23	Plentifuel Ind. Pvt Ltd	Gujarat	2019	10	N	Y	Y	Y
24	others		2018	150				
	Pilot Plants/under Erection			2,990.00				
25	Indian Railways	West Bengal, Tamil Nadu, Raipur		50				
26	CREDA, CG Govt	Raipur	2008	3				
27	RIL(pilot plant)	Andhra Pradesh	2009	10				
28	Ruchi(Pilot Plant)	Gujarat	2012	10				
29	Munzer Bharat	New Mumbai	2019	10				
30	Kaleesuwari Refinery Private Limited	Tamil Nadu	2020	650				
31	Others	Across the Country	2021	500				
				1,233.00				

Biodiesel procurement by the Oil Companies is as follows

Year	Biodiesel Procured by OMCs (Cr Litre)
2015-2016	1.19
2016-2017	3.59
2017-2018	4.36
2018-2019 (upto July 18)*	3.72

* POs have been placed for supply of 8.14 Crore litre of Biodiesel by OMCs

UCO availability for Biodiesel					
		18 Months	3rd Year	4th Year	
	Tons	30%			
Total Vegetable oil consumption per Annum	2,30,00,000.00				
			5%	15%	
Vegetable oil used by Household and others 70%	1,61,00,000.00		2,41,500.00	7,24,500.00	
Vegetable oil used by Processed Food 30%	69,00,000.00	20,70,000.00	14,49,000.00	20,70,000.00	
Collection possible after announcement of Policy		10,35,000.00	16,90,500.00	27,94,500.00	
conversion to BD in KL		11,89,655.17	19,43,103.45	32,12,068.97	
Cost of Biodiesel	52000/Kilo lit	₹ 61,86,20,68,965.52	₹ 1,01,04,13,79,310.35	₹ 1,67,02,75,86,206.90	
Revenue generation	GST 12%	7,42,34,48,275.86	12,12,49,65,517.24	20,04,33,10,344.83	
	Total	₹69,28,55,17,241.38	₹ 1,13,16,63,44,827.59	₹ 1,87,07,08,96,551.72	
Projected annual Business	Crores	₹ 6,928.55	₹ 11,316.63	₹ 18,707.09	

U.S. BIODIESEL MARKETPLACE



8.2 BILLION
GALLONS OF
BIODIESEL USED



REDUCED
BY 75.5 MILLION
METRIC TONS



**ANNUAL GREENHOUSE
GAS EMISSIONS OF**

15.9
MILLION

OR

PLANTING
1.9
BILLION

OR

PRESERVING
61.9
MILLION
ACRES



CARS



TREES



MATURE
FORESTS

78%
LESS

**LIFECYCLE GREENHOUSE GAS
THAN PETROLEUM DIESEL**



Since 2004, 8.2 billion gallons of biodiesel has replaced petroleum diesel to cut 75.5 million metric tons of carbon pollution. That's the equivalent of removing 15.9 million cars from American roadways OR planting 1.9 carbon-absorbing trees OR preserving 61.9 million acres of mature forests.

Biodiesel Feedstock ,By-product

What products do we offer?



FEEDSTOCK

WASTE-BASED PRODUCTS

- Used cooking oil
- Animal fat cat 1 and 2
- Animal fat cat 3
- Fatty acids and acid oil
- Palm oil mill effluent (POME)

CONVENTIONAL PRODUCTS

- Rapeseed oil
- Soybean oil
- Palm oil
- Refined palm oil



BIOFUELS

WASTE-BASED PRODUCTS

- UCOME biodiesel
- TME biodiesel

CONVENTIONAL PRODUCTS

- FAME 0°C
- RME
- SME
- PME



BY-PRODUCTS

WASTE-BASED PRODUCTS

- Crude glycerine
- Refined glycerine
- Bio-heating oil

CONVENTIONAL PRODUCTS

- 80% Kosher glycerine
- Refined pharma glycerine

Feedstock Import Data 2018-2019

Import of Non-edible Oils Rising :

Import of Non-edible oils increased by 25% during the year and is reported at 636,159 tons compared to 509,748 tons in previous year (2017-18).

Import of Non-edible Oils Nov.'18 To Oct.'19

(Qty. in M.T.)

Months	P.K.F.A.D	P.F.A.D.	C.P.S.	C.P.K.O.	RBD Palm Stearin	Others	Total
Nov., '18	--	19,512	14,593	--	22,435	4,000	60,540
Dec. '18	3,254	30,119	14,999	--	16,998	--	65,370
Jan. '19	--	44,347	12,390	--	7,919	--	64,656
Feb. '19	1,000	37,643	21,828	--	--	--	60,471
Mar. '19	--	34,679	9,125	--	9,498	--	53,302
Apr. '19	--	14,000	18,000	--	1,520	--	33,520
May '19	19,799	4,999	8,907	--	7,498	--	41,203
June '19	--	14,376	15,638	--	4,000	--	34,014
July '19	1,000	21,774	21,849	--	19,496	--	64,119
Aug. '19	--	39,287	16,966	--	7,000	--	63,253
Sept. '19	900	30,003	18,130	--	500	--	49,533
Oct., '19	---	17,994	24,115	--	2,569	--	46,178
Total (Nov. - Oct.)	25,953	308,733	196,540	--	99,433	--	636,159

Import of Non-edible Oil (Nov.- Oct.) (2014-15 To 2018-19)

(Qty. in M.T.)

Oil	2018-19 (Nov.-Oct.)	2017-18 (Nov.-Oct.)	2016-17 (Nov.-Oct.)	2015-16 (Nov.-Oct.)	2014-15 (Nov.-Oct.)
P.K.F.A.D.	25,953	7,997	20,244	11,444	16,561
P.F.A.D.	308,733	247,192	159,056	99,881	81,373
C.P.S.	196,540	163,173	52,164	7,499	7,000
C.P.K.O.	--	--	3,000	2,218	42,789
RBD Palm Stearin	99,433	88,386	112,284	46,422	43,508
Others	5,500	3,000	16,074	--	--
Total	636,159	509,748	362,822	167,464	191,231

-3-

Average Prices and Rupee depreciation :-

(Price in US\$/CIF Indian Port/Ton)

Oils	Oct. 2019	Sept. 2019	Aug. 2019	July 2019	June 2019	May 2019	Apr. 2019	Mar. 2019	Feb. 2019	Jan. 2019	Dec. 2018	Nov. 2018	Oct. 2018
RBD Palmolein	567	564	571	532	539	543	569	559	585	570	518	510	568
Crude Palm Oil	541	534	534	490	492	498	530	520	550	538	482	472	529
Crude Soybean Oil	722	726	729	695	706	703	692	711	760	709	679	682	706
Crude Sunflower Oil	746	774	809	803	756	739	715	716	730	712	693	689	717
Crude Rapeseed Oil	787	789	773	761	740	743	740	741	759	747	733	725	740
FE: 1US\$ = (Average)	71.09	71.31	71.19	68.74	69.39	69.78	69.40	69.50	71.17	70.71	70.83	71.73	73.56

Prices of palm oils in the international market during last one year have moved in the range of 1 to 3%. The spread between Palm Oil and Soft Oils has increased leading to higher import of palm products.



THE SOLVENT EXTRACTORS' ASSOCIATION OF INDIA
The Premier Association of Vegetable Oil & Trade of India

ISO 9001:2015 Organisation | NGO Recognised by Ministry of Agriculture, Govt. of India | TPO Recognised by Ministry of Commerce, Govt. of India

Structure of Vegetable Oil Market in India:

India is one of the leading consumers of vegetable oil in India. At present, 2466 crore litres of vegetable oil is consumed in the country.

Consumption	Crore Litres	Percentage
Total Veg Oil	2,466.67	100%
Commercial	986.67	40%
Household	1,480.00	60%

The source of the oil consumed is as follows:

Source	Crore Litres
Import	1,666.67
Domestic	800.00

Considering the above figures the following is the potential availability of Used Cooking Oil from household as well as commercial sources:

Source	Availability (crore litres)	Potential % generation
UCO commercial	148.00	15%
UCO household	74.00	5%
Total	222	

The current consumption trend of UCO is as follows:

Present Consumption of UCO(in Cr Lit)		
Food	133.20	60%
Soaps & Oleo	33.30	15%
Misc(including biodiesel)	22.20	10%
Animal Feed	33.30	15%
Total	222.00	100%

With whom do we work?



Brokerage: support along the supply chain

We continuously **look for new**
trustworthy suppliers

We provide everyday
analysis of the market to
offer **transparent pricing**

We can optimise our supply chain
due to **international sourcing**

We can also take care
of the **logistics**

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

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

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

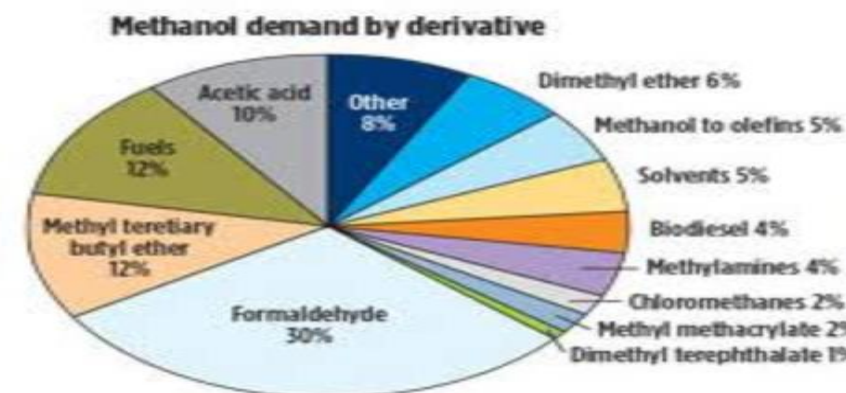
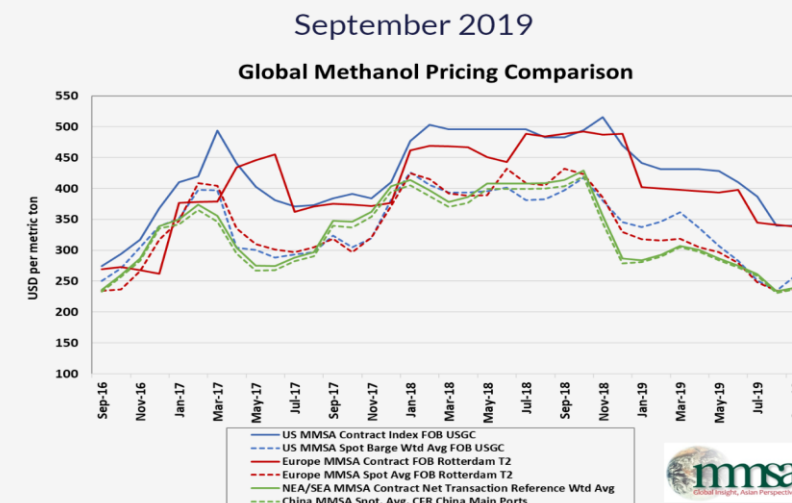
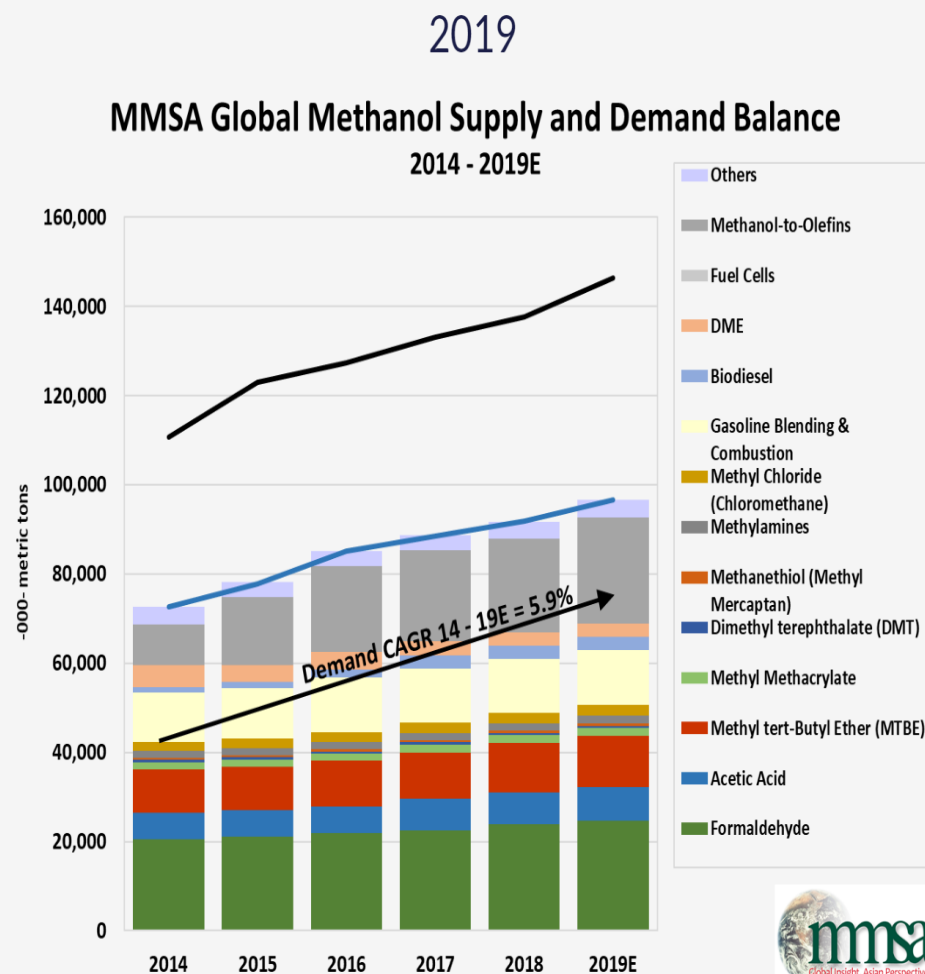
We help our clients
develop their strategy
towards new markets

We guarantee **full confidentiality**

We aim at establishing
long-term relationships
with our clients



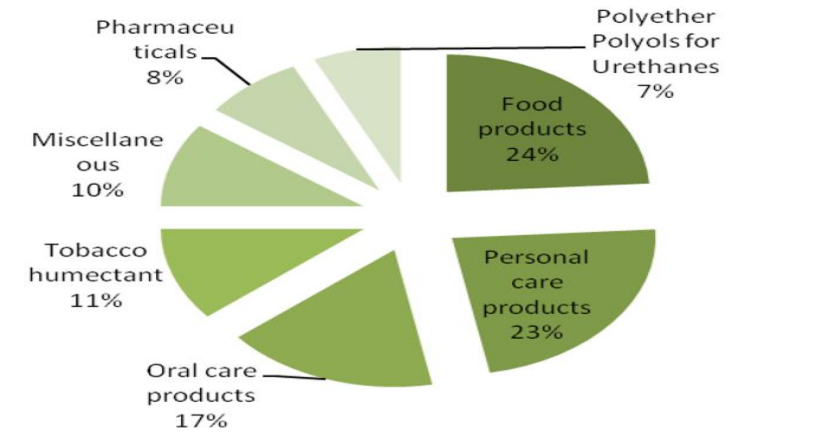
Methanol Demand and Supply 2019



Crude Glycerin

1) Last six month pricing trends of Crude and refined glycerin

Current Prices of Glycerine in US\$/MT (Crude and Refined)													
	June		July		August		September		October		November		
FOB	Crude	Refined	Crude	Refined	Crude	Refined	Crude	Refined	Crude	Refined	Crude	Refined	
UK	310 - 325	-	255-275	610-630	260-280	615-635	250-270	605-625	260-280	615-635	270-290	625-645	
Malaysia	295 - 315	720 - 730	260-270	635-645	265-275	640-650	255-265	630-640	265-275	640-650	275-285	650-660	
Singapore	300 - 320	-	265-275	520-525	270-280	525-530	260-270	515-520	270-280	525-530	280-290	535-540	
Indonesia	310 - 330	715 - 735	260-270	605-630	265-275	610-635	255-265	600-625	265-275	610-635	275-285	620-645	
China	.		240-245	595-605	245-250	600-610	235-240	590-600	245-250	600-610	255-260	610-620	
Argentina	.		230-235	590-600	235-240	595-605	225-230	585-595	235-240	595-605	245-250	605-615	
USA	.		220-230	530-540	225-230	535-545	215-220	525-535	225-230	535-545	235-240	545-555	
Spain	300 - 310		245-250	555-575	250-255	560-580	240-245	550-570	250-255	560-580	260-265	570-590	
Thailand	-	745 - 755	250-255	655-665	255-260	660-670	245-250	650-660	255-260	660-670	265-270	670-680	
Portugal	305 - 320		245-250	600-615	250-255	605-620	240-245	595-610	250-255	605-620	260-265	615-630	
India CIF													
India	335 - 340	755 - 765	290-305	650-660	295-310	655-665	285-300	645-655	295-310	655-665	305-320	665-675	



Graph 1: End use of refined glycerine worldwide

1) India imported 669995 MT of crude glycerin so far this year. 52% at Mundra, 30% JNPT, 5% Vishakhapatnam, 3% Ludhiana, 3% Loin, 1% krishnapatnam, 1% kakinada, 1% Kolkata, and rest other ports.

2) India's largest Glycerine importers in September were Hindustan Unilever, VVF (India), Godrej Industries, Sandeep Organics, Kaleesuwari Refinery And Industry & more.

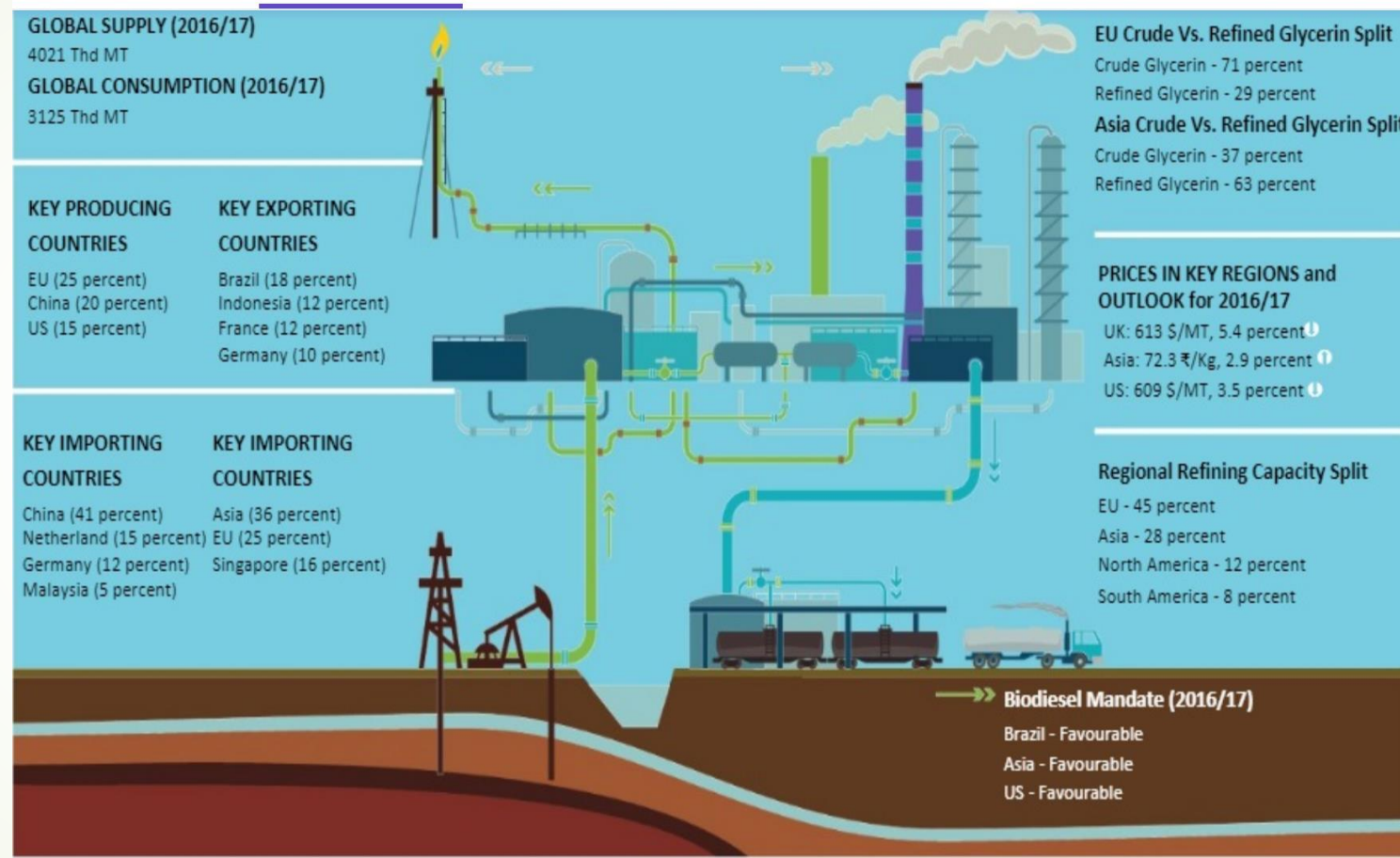
3) Crude Glycerin Import Price **260-320\$** Per MT and Refined is **570-765\$** Per MT

4) Last six-month crude glycerin import.

May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19
9142	13,710	7,841	8,276	2,019	5,793

Key Global Glycerin Buyer List

- Archer Daniels Midland Company (USA)
- BASF SE (Germany)
- Cargill, Inc. (USA)
- CREMER OLEO GmbH & Co. KG (Germany)
- Croda International Plc (UK)
- Ecogreen Oleochemicals (Singapore)
- Godrej Industries Ltd. (India)
- IOI Group (Malaysia)
- Kao Corporation (Japan)
- KLK OLEO (Malaysia)
- Pacific Oleochemicals Sdn Bhd (Malaysia)
- PMC Biogenix, Inc. (USA)
- Procter & Gamble Chemicals (USA)
- PT. Cisadane Raya Chemicals (Indonesia)
- PT. Sumi Asih Oleochemical Industry (Indonesia)
- Sakamoto Yakuhin Kogyo Co., Ltd. (Japan)
- Thai Glycerine Co., Ltd. (Thailand)
- The Dow Chemical Company (USA)
- Twin Rivers Technologies, Inc. (USA)
- Vance Bioenergy Sdn. Bhd. (Malaysia)

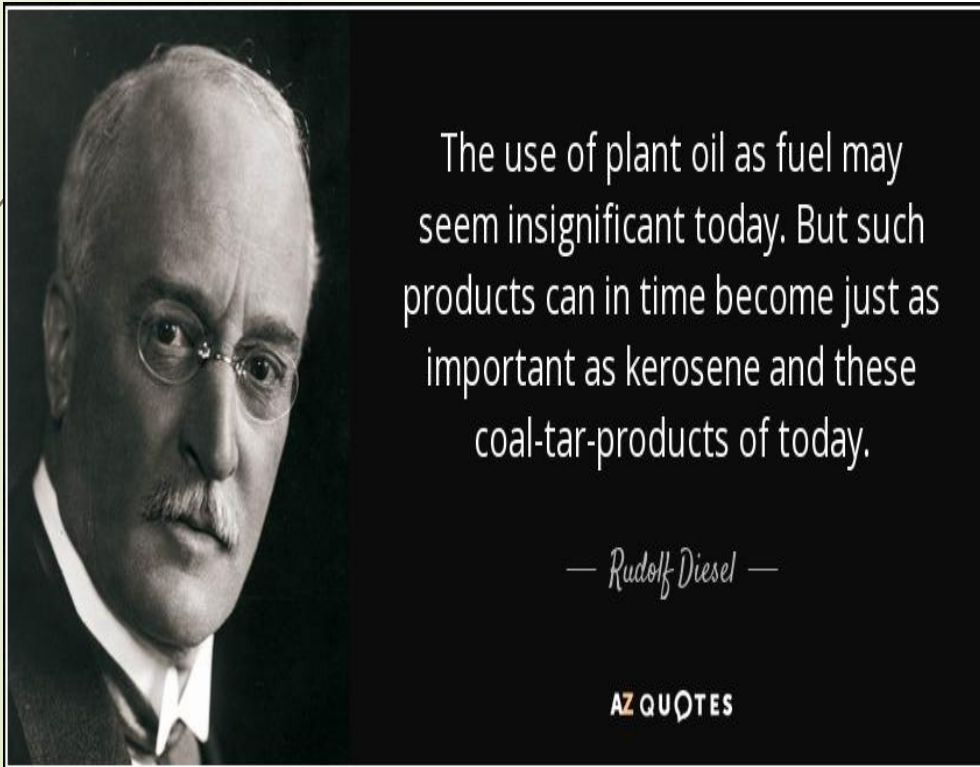


Glycerin Specifications:

Properties	Crude Glycerin	Technical Grade Glycerin	99.7 -USP Grade Glycerin
Glycerol Content	40 - 88%	98.0 Min	99.70%
Ash	2.0% Max	N/A	N/A
Moisture Content	N/A	2.0% Max	0.3% Max
Chlorides	N/A	10 ppm Max	10 ppm Max
Color	N/A	40 Max (Pt - Co)	10 Max. (APHA)
Specific Gravity	N/A	1.262 (@25C)	1.2612 Min
Sulfate	N/A	N/A	20 ppm Max
Assay	N/A	N/A	99.0 - 101.0% (on dry basis)
Heavy Metals	N/A	5 ppm Max	5 ppm Max
Chlorinated Compounds	N/A	30 ppm Max	30 ppm Max
Residue on Ignition	N/A	N/A	100 ppm Max
Fatty Acid & Ester	N/A	1.00 Max	1.000 Max
Water	12.0% Max	5.0% Max	0.5% Max
pH (10% Solution)	4.0 - 9.0	4.0 - 9.1	N/A
DEG and Related Compounds	N/A	N/A	Pass
Organic Volatile Impurities	N/A	N/A	Pass
Organic Residue	2.0% Max	2.0% Max	N/A



ANY
QUESTIONS?



Thank
You!

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