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The Proven Concept & Implementation Model in

Jatropha Cultivation

&

Biofuel Production

via

Nano-Emulsion & Polarization Technology

Presented by :
Zurina Amnan, Group CEO, BIONAS

BIT's 2nd New Energy Forum 2012
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JATROPHA PLANTATION & BIOFUEL PROGRAM WORLDWIDE

MAIN CHALLENGES :

- Labour Intensive – Harvesting is done on daily basis. Only fruits which are yellow and black can be collected.

- Low yield/production – lack of knowledge and technology.

- Unavailability of Feedstocks – Average buy back market price of jatropha harvests (seeds) worldwide is at US$100 – US$150 per ton and not attractive to the farmers.

- Land for Jatropha cultivation - lease, rent or buy.

- Bio-diesel production via "*Transesterification*" which normally uses methanol derives from petroleum sources and energy intensive. Turning Jatropha bio-diesel to meet EN14214 with minus 21C pour point requires the said methyl ester to be fractionated twice and this process is very energy intensive and very costly.

Harvest all year round – labour intensive

BIONAS CONCEPT & TECHNOLOGY :

- FREE Jatropha Seeds for 4 hectares per person/farmer to gain access for FREE Land and FREE Workers.

- Guarantee buy back of harvests at US$260 - US$400 per ton has increased the number of farmers planting on their own land which guarantee the sustainability supply of feedstocks.

- Capability to buy back the harvests at high price due to :

  - Biofuels produced via Polarization and Nano-Emulsion Technology which is very cost effective;

  - No investment for a new set up of Refinery; and

  - Making use of the existing infrastructures, blending and storage facilities at existing refineries, port and airport.

KEY SUCCESS FACTORS

*** FREE LAND & FREE WORKERS * GOOD BUY BACK PRICE OF HARVEST ***

*** POLARIZATION & NANO EMULSION TECHNOLOGY IN BIOFUEL PRODUCTION ***

Existing Supply Chain of Biofuel Production

Gas Station

Refinery -Transesterification

Press Mill

Agent

Farmers

Savings on refinery (transesterification) is channeled to the existing industries

Polarization
&
Nano-Emulsion
Technology

Minimum Savings
of USD50 Million

Gas Station

Press Mill

Agent

Farmers

Savings on refinery (transesterification) is channeled to the farmers
by offering good buy back price of their harvest

BIONAS Supply Chain of Biofuel Production

100% financing of Jatropha Seeds to plant 10 acres/farmer

Multiple Branches

Planting in swampy areas

Pruning

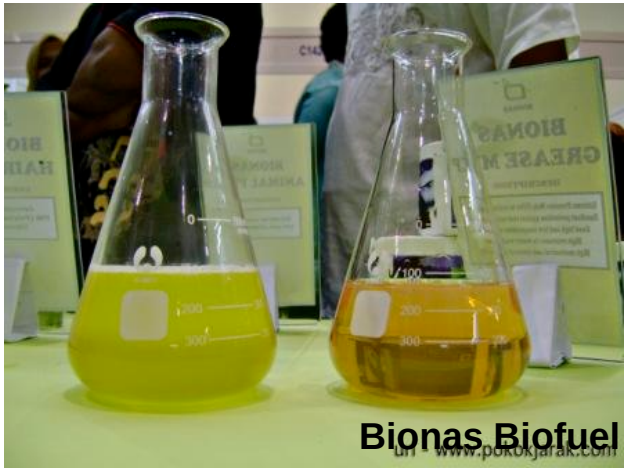
700kgs/hectare/month

Intercropping is encouraged

CURRENT WORLD "WHITE DIESEL" SUPPLIERS

BP [ASPIRA] **UK** *license from Lubrizol*
CHEVRON [PROFORMIX] **USA** *license from Lubrizol*
LUBRIZOL [PURINOx] **USA**
SHELL [AQUADIESEL] **AUSTRALIA**
TOTAL FINA ELF [AQUAZOLE] **FRANCE**
CAM TECHNOLOGY [GECAM] **ITALY**

There are hundreds of patents on emulsified fuel and numerous successful tests conducted world-wide. Lubrizol and Chevron has been selling emulsifier and emulsified fuel and having thousands of vehicles running on them. These emulsified fuels have received certifications from vehicle manufacturers like Caterpillar and others. However, those emulsified fuel/diesel is not biodegradable and milky colour.



Water in fuel/diesel/petrol yields the following effects:

1.. Water vaporization increases fuel dispersion in the form of smaller droplets.

2.. Contact surface between fuel and air is increased.

3.. Combustion is more efficient.

4.. The explosion of excess water into steam and the splitting of water into H_2 and O_2 will increase power and fuel economy.

5.. Reduces combustion temperature peak.(lowers NOx)

6.. Particulate formation is reduced (lowers PM)

7.. Lower emissions: Up to 25% Nox reduction, up to 60% PM reduction, up to 80% smoke reduction, up to 5% CO_2 reduction.

8.. Better lubricity.

9.. Increased thermal efficiency.

Note: Emulsified diesel/fuel is the only emission-control fuel technology that simultaneously lowers both PM and NOx. with NO FREE WATER.

MOFAZ

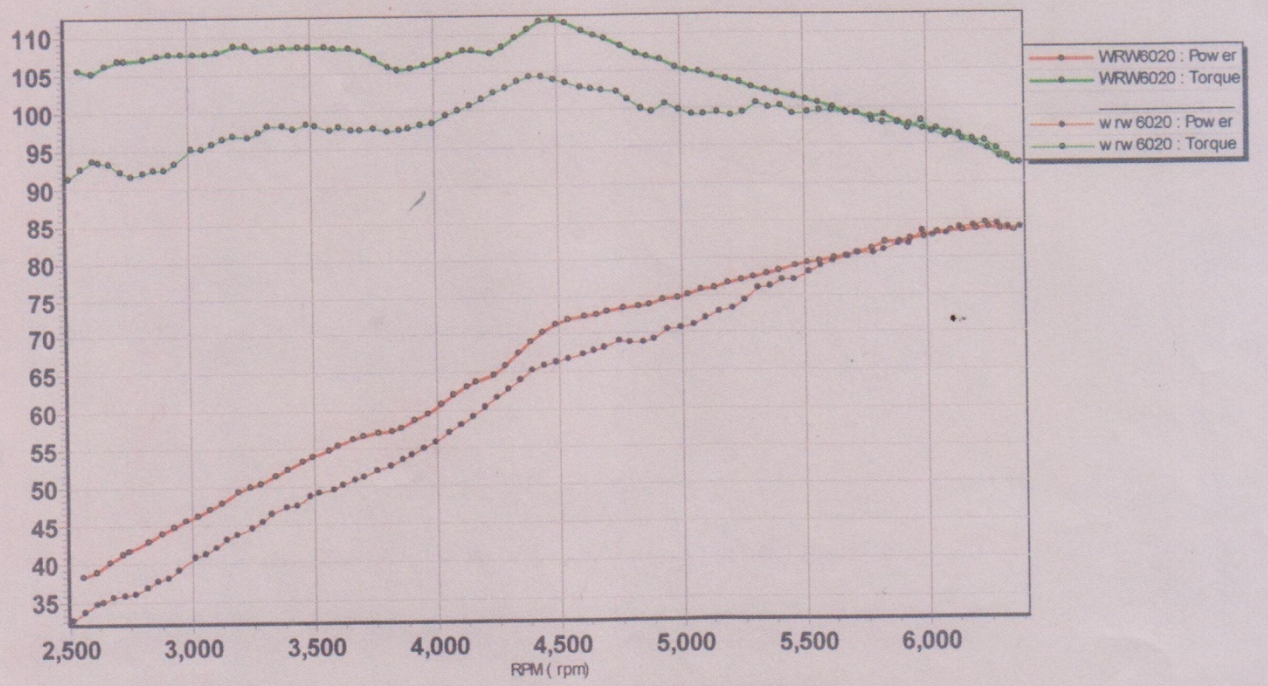
Links Dyno Tune

HYPER POWER INTERNATIONAL

TEL:+603-5636-9901
FAX:+603-5636-7701

Links Dyno Tune
NO 30JLN PJS 11/3,
BANDAR SUNWAY,
46150 PETALING JAYA
SELANGOR DARUL EHSAN

Links Dyno Tune



Vehicle : WRW6020
Test : Test30
Duration: 0:0:10.925
Date: 12/14/10
Ambient Correction : 2 %
for Petrol Normally aspirated.
Duration: 0:0:10.925
Date: 12/14/10

Speed : 124 km/h @ 6348 rpm
Power : 83.9 Hp @ 6249 rpm
Torque: 112 Nm @ 4483 rpm
Petrol Ron 97 Esso + G100

Vehicle : wrw6020
Test : Test34
Duration: 0:0:11.927
Date: 12/14/10

Power : 84.5 Hp @ 6234 rpm
Torque: 104 Nm @ 4389 rpm
Petrol Ron97 Shell + B20

DYNO TEST RESULT

MOFAZ is a major name in the automotive scene in Malaysia & currently competing in the Formula1–Renault 3.5series.

Although MOFAZ added their G100 additives and BIONAS mixed with 10% water and 10% Jatropha additives, the actual result from the dyno testing shows increment in horse power at lower RPM when using Bionas' B20 Bio-Petrol

Due to presence of bio-components, the CALORIFIC VALUE for most of Bionas fuels is slightly decreases compared to their corresponding standard fuels. However, more efficient burning and better injection efficiency due to higher viscosity may counteract this energy loss.

Example of increased Calorific Value :
Reg Heavy Fuel :149,400 Btu/US gallon
B25 HeavyFuel : 152,000 Btu/US gallon

ECONOMICS OVERVIEW

- 2000 Jatropha trees per hectare;
- Distance of 2.5m x 2.5m;
- Harvest on the 6th month, all year round for 50 years (in tropical climates);
- 700 kgs per hectare per month
- Site clearance – no ploughing, no terracing & no machineries; cultivation on unutilized land, ex-logging land and degraded land.
- Less maintenance – no pesticide; and
- Fertilizer – dried chicken waste

Latest R&D, harvest on the 2nd month with high yield

Bionas Press Mill in remote areas

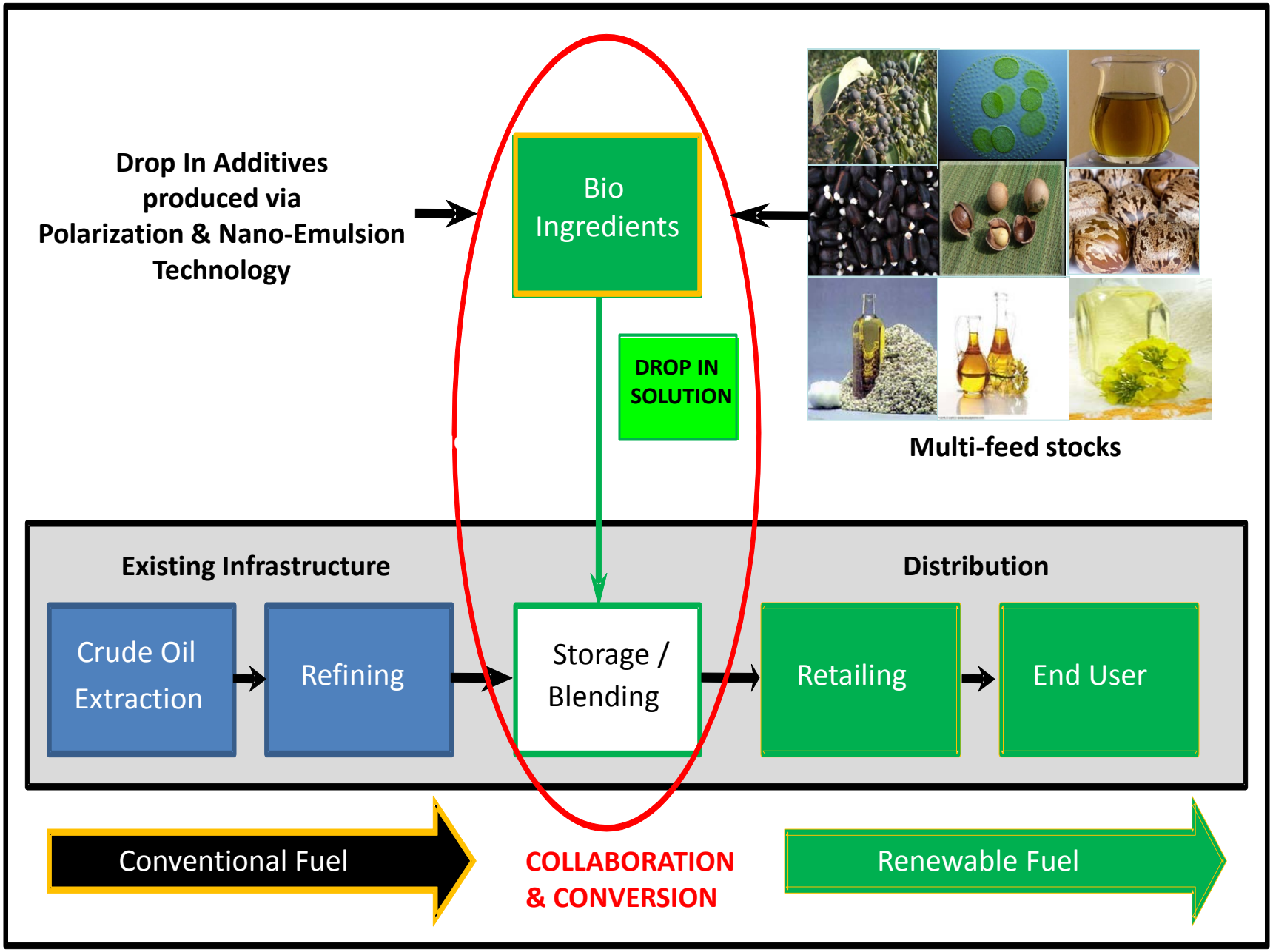
BIONAS

BERNAS LS QUAL
BERNAS 042/2009)
and Exported For:
BERHAD

Machines to produce Jatropha seedcake pallet and briquette (Biomass)

Jatropha Biomass – Pallet & Briquette

Collaboration and Conversion Process

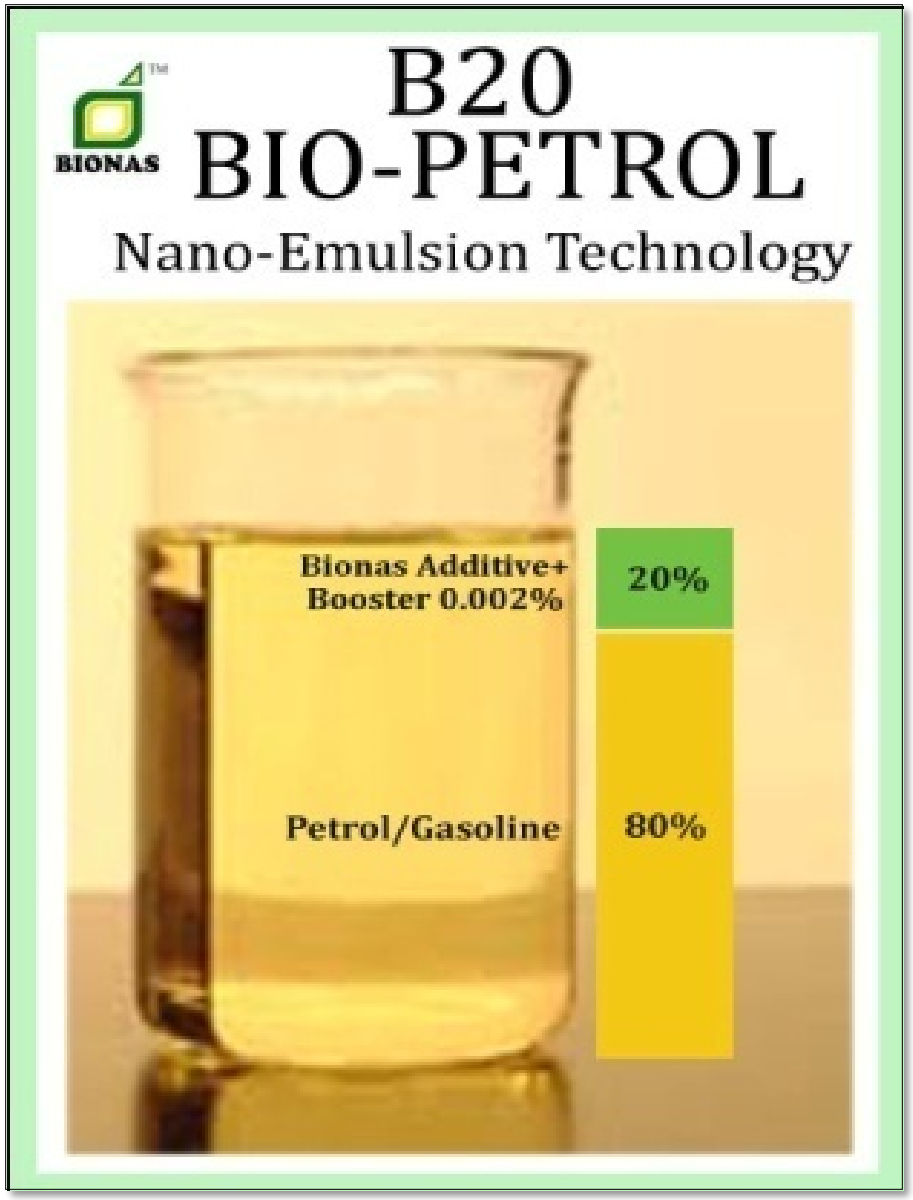


Bionas' Biofuel Products :-

1. B20 Bio-petrol
2. M30 Petrol
3. B10 - B30 Bio-Diesel
4. B25 Bio-Heavy Fuel
5. B25 Bio-Jet Fuel
6. Bio-Energy Emission Solution (BEES) – Coal Enhancer
7. Bio-Booster Tablet (Drop In)

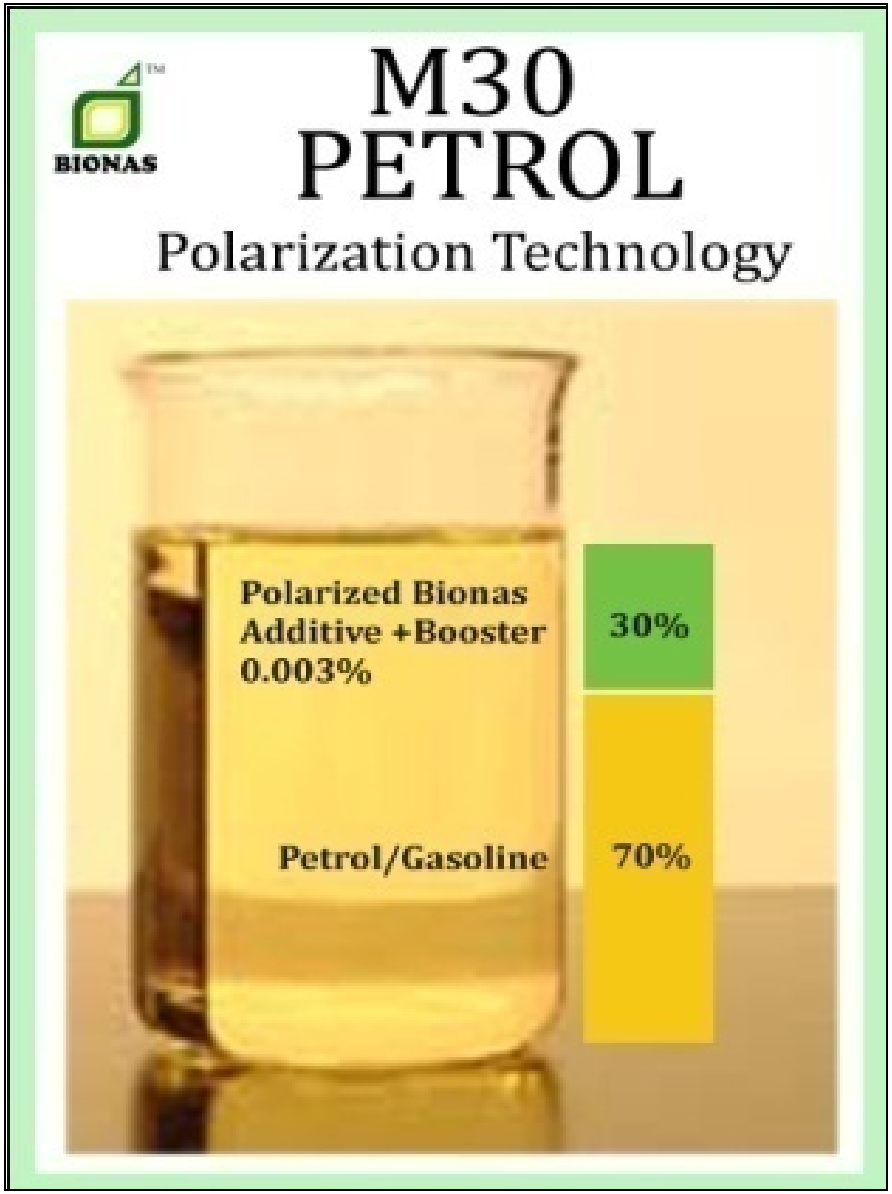
Produced via
Nano-Emulsion and Polarization Technologies

B20 Bio-Petrol

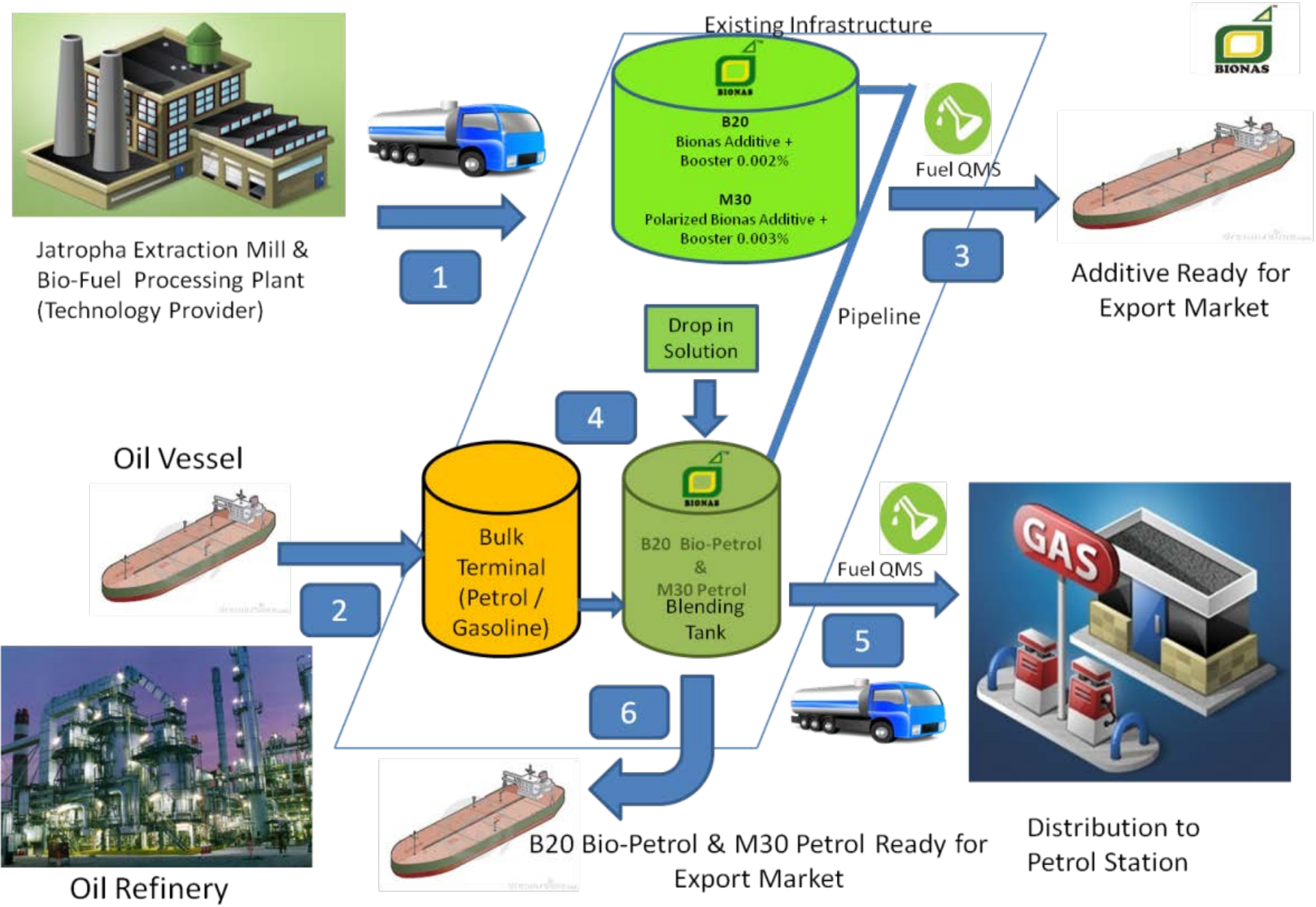


M30 Petrol

GO GREEN
BIONAS
M-PETROL
SAVE WITH BIO FUEL
M30
Petrol
Polarization
Technology
MORE
Saving
Kilometer
Power
Cleaner
Less Maintenance
Environmental Friendly
QUALITY &
QUANTITY
BIONAS BIO-ADDITIVES
For more information, visit us at www.biofuelbionas.com


BIONAS
M30
PETROL
Polarization Technology
Polarized Bionas
Additive +Booster
0.003%
30%
Petrol/Gasoline
70%

B20 Bio-Petrol & M30 Petrol Commercial Flow Process



B20 Bio-Petrol & M30 Petrol Commercial Flow Process

1. Bionas Additive is produced from Jatropha Extraction Mill and Bio-Fuel Processing Plant.
2. Petrol/Gasoline, from Oil Vessels/ Refinery is normally stored in Bulk Terminals.
3. Bionas Additive stored in Bulk Terminals, is ready for sale or export through Vessels/ Barges.
4. i) A blending storage tank is needed to produce B20 which consist of 80% Petrol, and another 20% Bionas Additive mixed with Booster 0.002% .

   ii) A blending storage tank is needed to produce M30 consisting of 70% Petrol and 30% Polarized Bionas Additive mixed with Booster 0.003% .
5. B20 & M30 are ready for distribution to service stations (Consumers).
6. B20 & M30 are ready for export through Vessels/ Barges.

<u>Market Segmentation</u>

Petrol based internal combustion engines i.e. Automobiles, Motorcycles, etc.

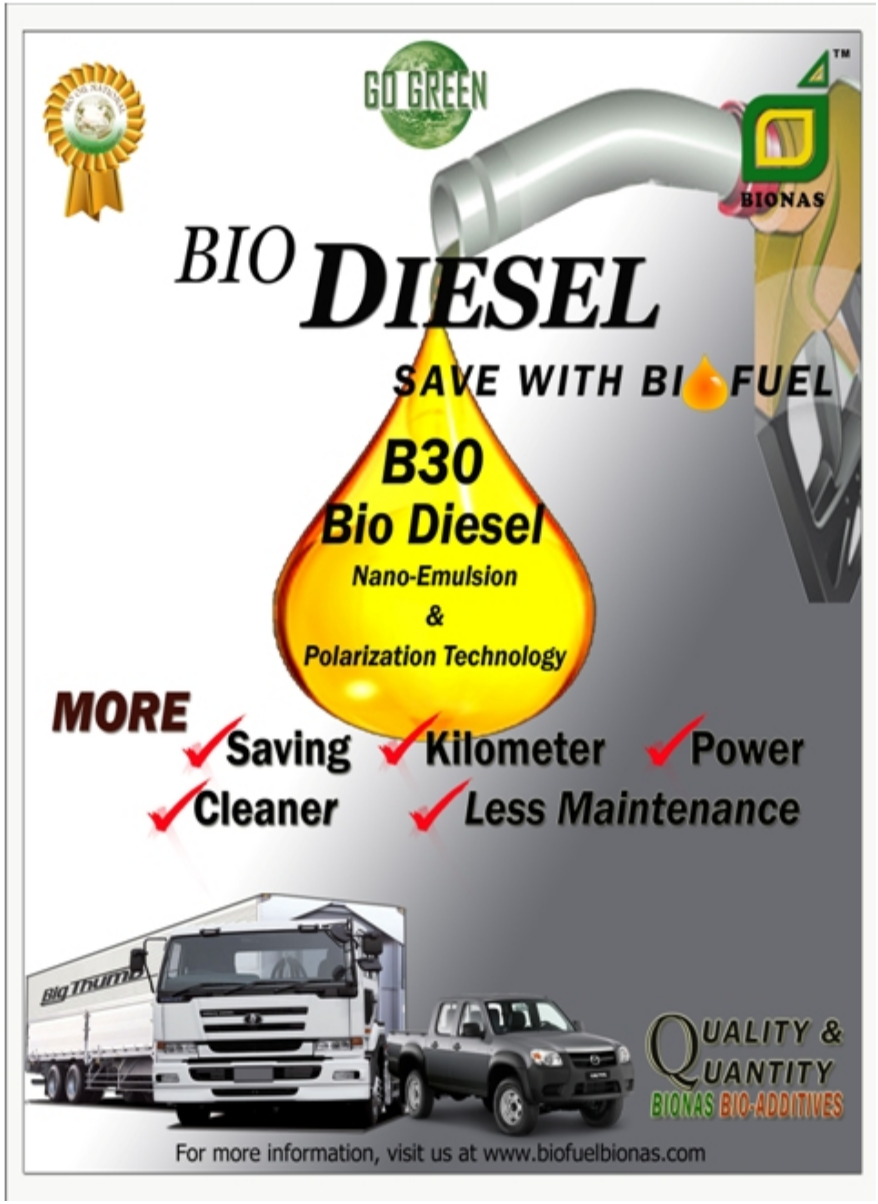
BIONAS B20 BIO-PETROL SPECIFICATION

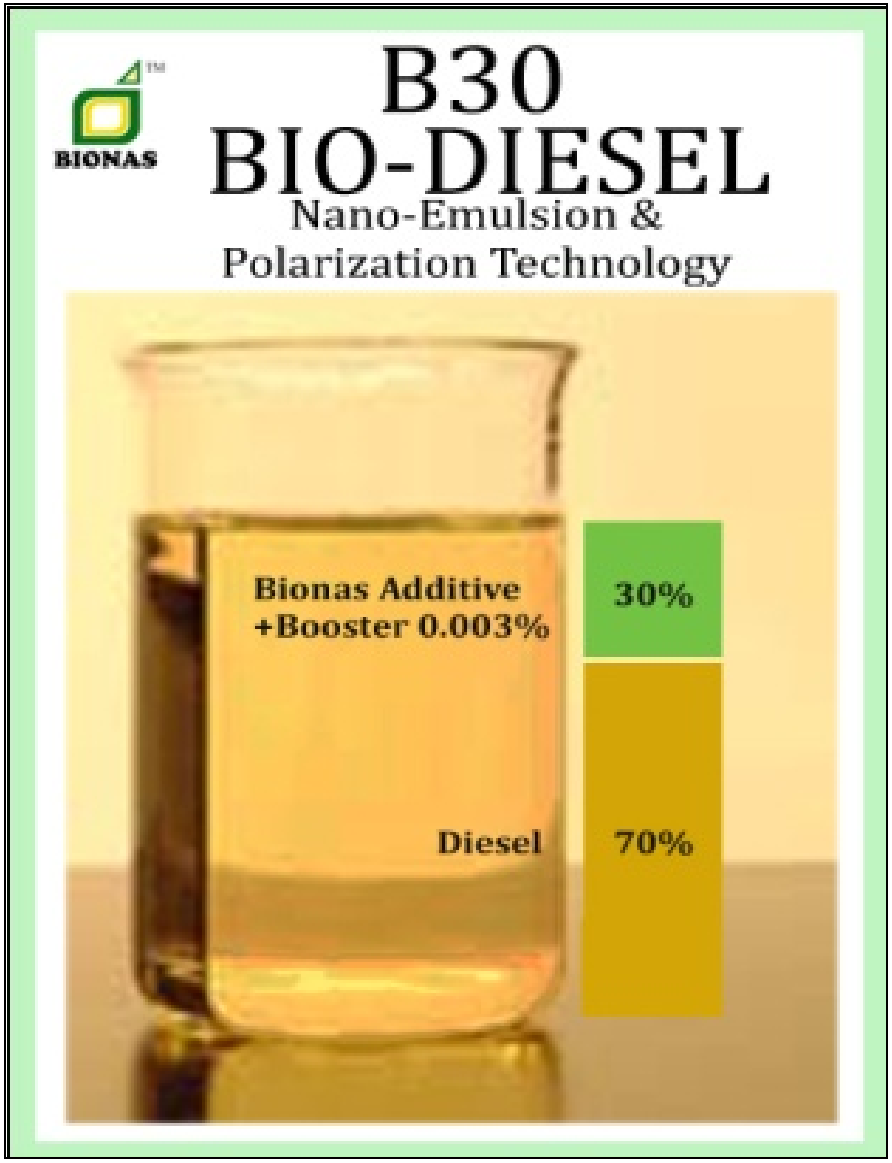
Analysis	B20 Bio-Petrol	ASTM Standard (Petrol)	Test Method
Density @ 15°C (kg/L)	**0.780**	0.710 – 0.785	ASTM D1298
Appearance	**Clear**	Clear	Visual
Distillation:			
IBP (°C)	**53**	Max: 70	ASTM D86
90% (°C)	**162**	Max: 180	ASTM D86
FBP (°C)	**190**	Max: 205	ASTM D86
Residue (Vol%)	**2**	Max: 2	ASTM D86
Sulphur (ppm)	**1.84**	Max: 15	ASTM D5453
RON	**105.0**	Min 97.0	ASTM D2699

BIONAS M30 PETROL SPECIFICATION

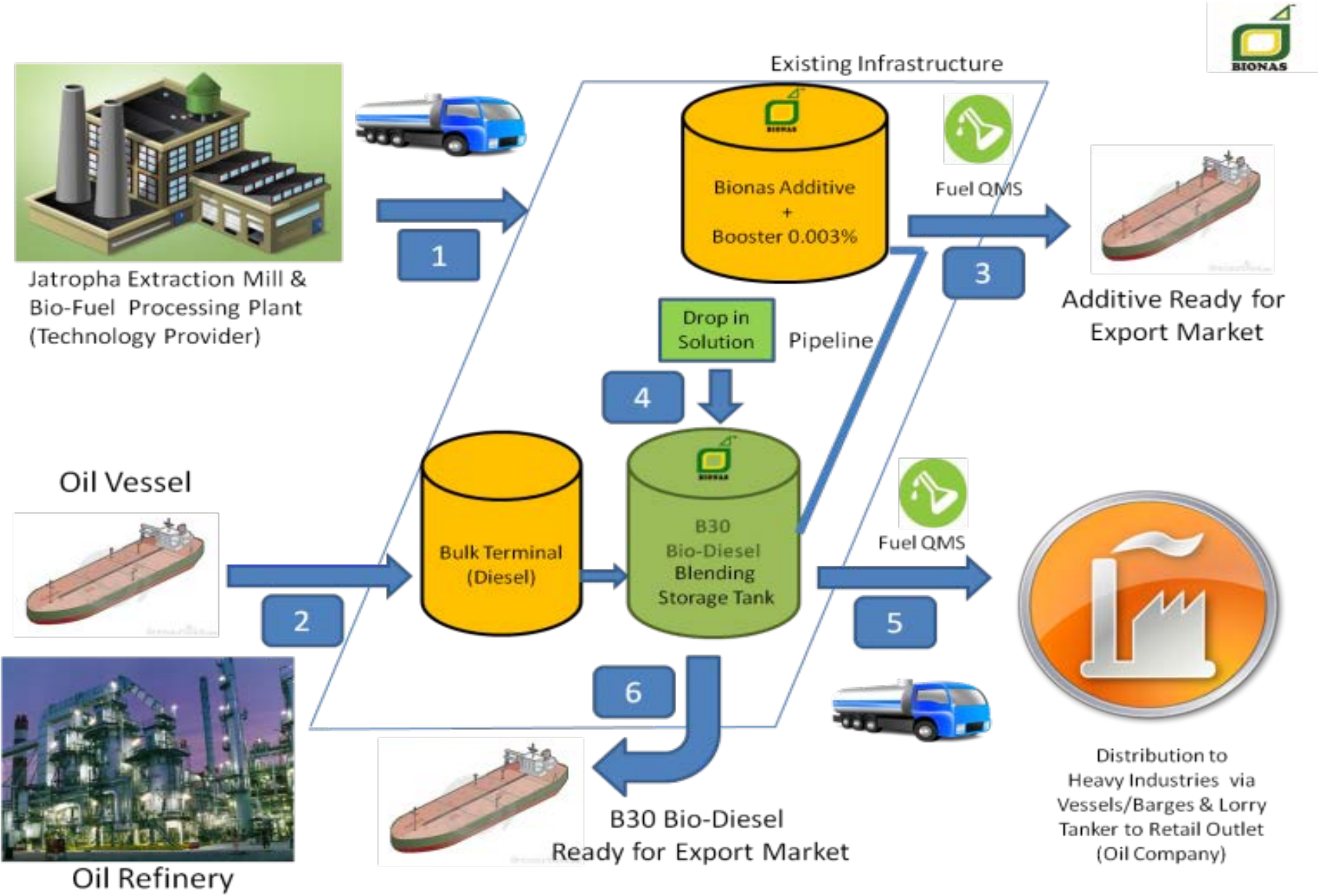
Analysis	M30 Petrol	ASTM Standard (Petrol)	Test Method
Density @ 15°C (kg/L)	**0.778**	0.710 – 0.785	ASTM D1298
Appearance	**Clear**	Clear	Visual
Distillation:			
IBP (°C)	**51**	Max: 70	ASTM D86
90% (°C)	**141**	Max: 180	ASTM D86
FBP (°C)	**177**	Max: 205	ASTM D86
Residue (Vol%)	**0.5**	Max: 2	ASTM D86
Sulphur (ppm)	**0.84**	Max: 15	ASTM D1266
RON	**122.2**	Min: 97.0	ASTM D2699

B30 Bio-Diesel





B30 Bio-Diesel Commercial Flow Process



B30 Bio-Diesel Commercial Flow Process

1. Bionas Additive is produced from Jatropha Extraction Mill and Bio-Fuel Processing Plant for delivery to storage facility at Ports.
2. Diesel, from Oil Vessels/ Refinery is normally stored in Bulk Terminals.
3. Bionas Additive stored in Bulk Terminals at the Port is ready for sale or export through Vessels/ Barges.
4. A blending tank is required to produce B30 Bio-Diesel consisting of; 70% Diesel, 30% Bionas Additive all mixed with Booster 0.003%.
5. B30 Bio-Diesel is ready for distribution to local market and service stations.
6. B30 Bio-Diesel is ready to be exported through Vessels / Barges.

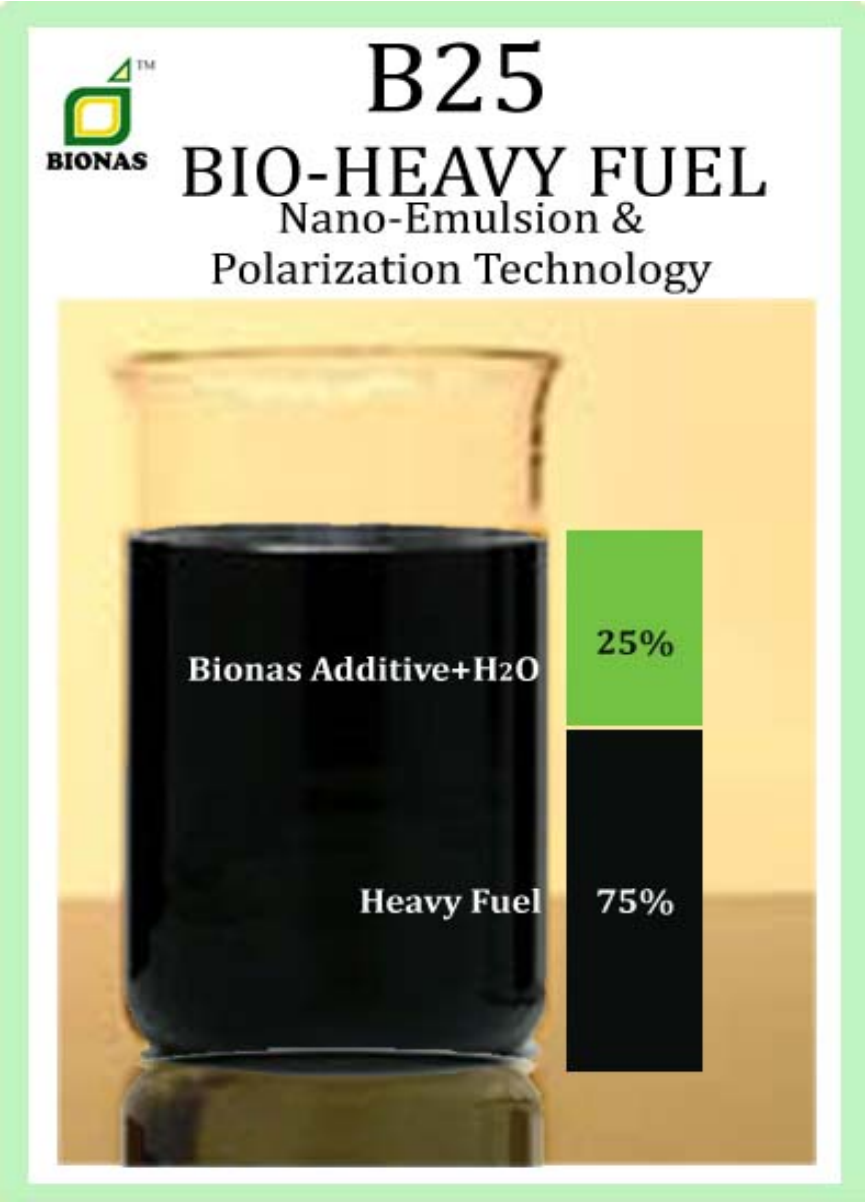
<u>Market Segmentation</u>

Diesel based engines and for industrial heavy machineries.

BIONAS B30 BIO-DIESEL SPECIFICATION

Analysis	B30 Bio-Diesel	ASTM Standard (Diesel)	Test Method
Density at 15°C (kg/L)	0.88	0.81 – 0.87	ASTM D1298
Flash Point (°C)	160	Min: 60	ASTM D93
Kinematic Viscosity @40°C (cSt)	4.80	1.6 – 5.8	ASTM D445
Total Sulphur (%mass)	0.05	Max: 0.30	ASTM D4294
Cetane No.	49	Min: 47	ASTM D976
Pour Point (°C)	-15	Max: 15	ASTM D97
Distillation @90% Recovery °C	360	Max: 370	ASTM D86
Copper Strip Corrosion 3hrs @ 50 °C (Ma. No.1)	1B	1B	ASTM D 130
Ramsbottom Carbon Residue on 10% distillation (wt %)	0.04	0.05	ASTM D524
Sulphated Ash (% mass)	<0.001	0.001	ASTM D482

B25 Bio-Heavy Fuel



B25 Bio-Heavy Fuel Commercial Flow Process

Jatropha Extraction Mill & Bio-Fuel Processing Plant (Technology Provider)

2

Existing Infrastructure

Bionas Additive + H_2O

Fuel QMS

3

Pipeline

Additive Ready for Export Market

Drop in Solution

4

Oil Vessel

1

Bulk Terminal (Heavy Fuel 180cst – 500 cst)

B25 Bio-Heavy Fuel Blending Storage Tank

Fuel QMS

5

Oil Refinery

6

Distribution to Heavy Industries via Vessels & Road Transport

B25 Bio-Heavy Fuel Ready for Export Market

B25 Bio-Heavy Fuel Commercial Flow Process

1. Heavy Fuel from Oil Vessels/ Refinery is normally stored in Bulk Terminal.
2. Bionas Additive is produced from Jatropha Extraction Mill and Bio-Fuel Processing Plant.
3. Bionas Additive stored in Bulk Terminals, is ready for sale or export through Vessels/ Barges.
4. A blending tank is required to produce B25 Bio-Heavy Fuel consisting of; 75% Heavy Fuel, 25% Bionas Additive mixed with H2O.
5. B25 Bio-Heavy Fuel is ready for distribution to Heavy Industries, Power Plants etc.
6. B25 Bio-Heavy Fuel is ready to be exported through Vessels / Barges.

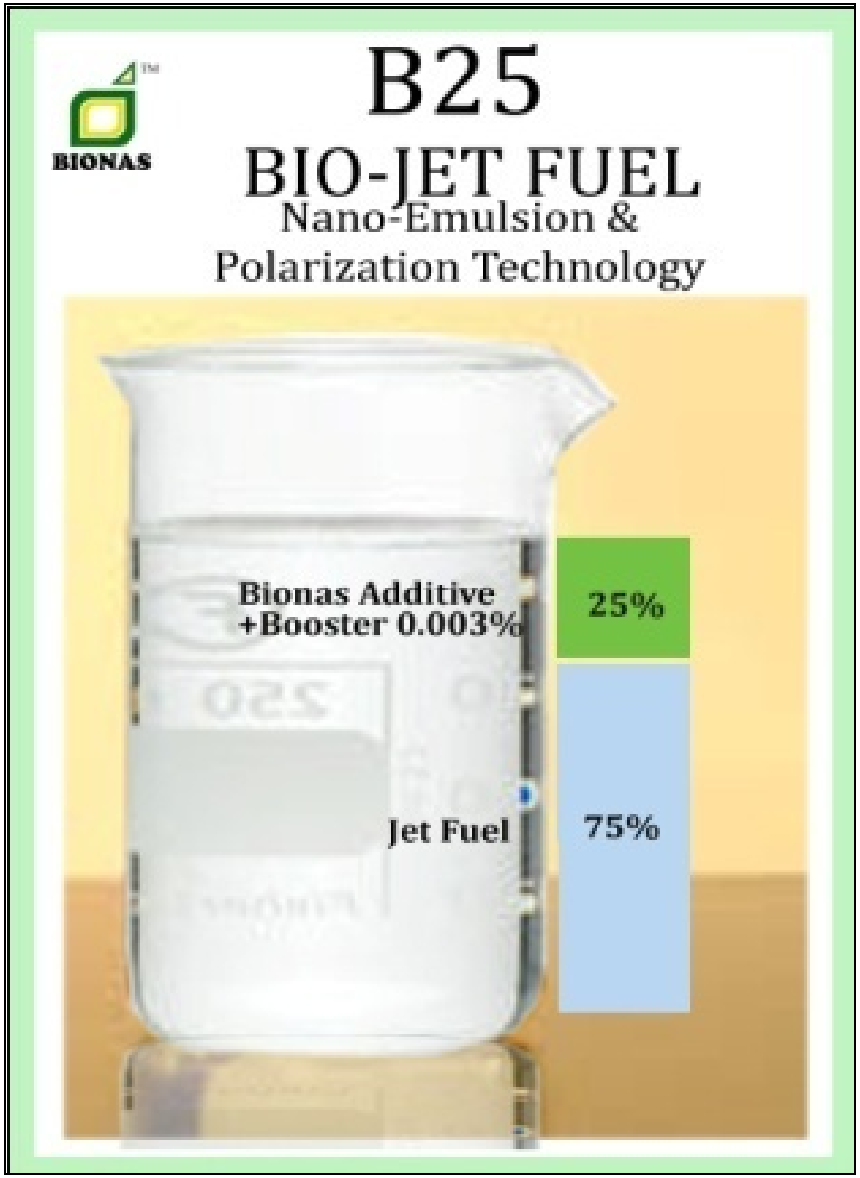
<u>Market Segmentation</u>

Shipping & Heavy Industry.

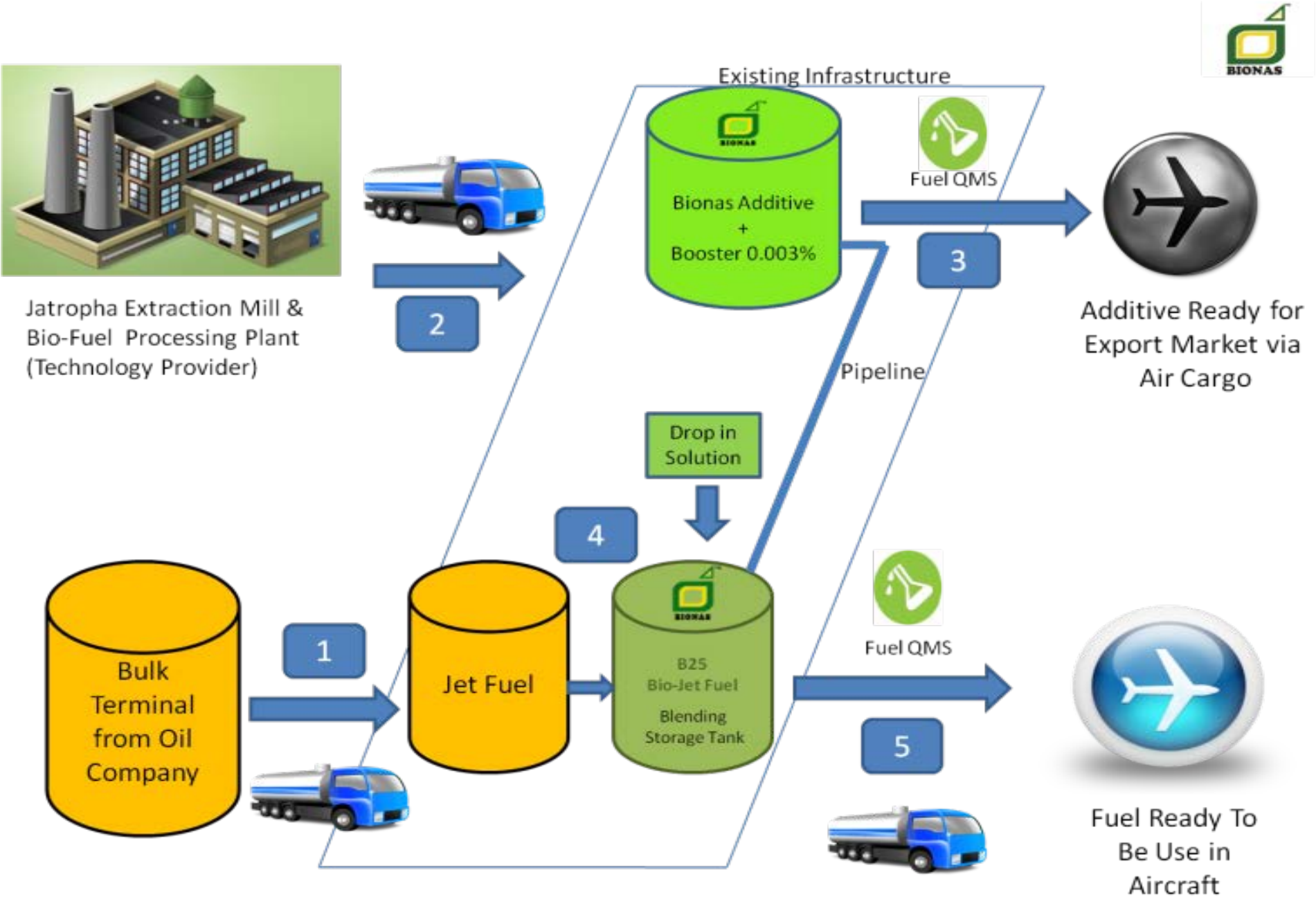
BIONAS B25 BIO-HEAVY FUEL SPECIFICATION

Analysis	B25 Bio-Heavy Fuel	ASTM Standard (Heavy Fuel)	Test Method
Density (g/mL)	0.9503	Max: 0.960	ASTM D1298
Flash Point (°C)	120	Min: 66	ASTM D93
Kinematic Viscosity @ 50 °C (cSt)	177	Max: 180	ASTM D445
Pour Point (°C)	2	Max: 21	ASTM D97
Total Sulphur (% mass)	1.82	Max: 3.5	ASTM D4294
Sulphated Ash (% wt)	0.089	Max: 0.1	ASTM D482

B25 Bio-Jet Fuel



B25 Bio-Jet Fuel Commercial Flow Process



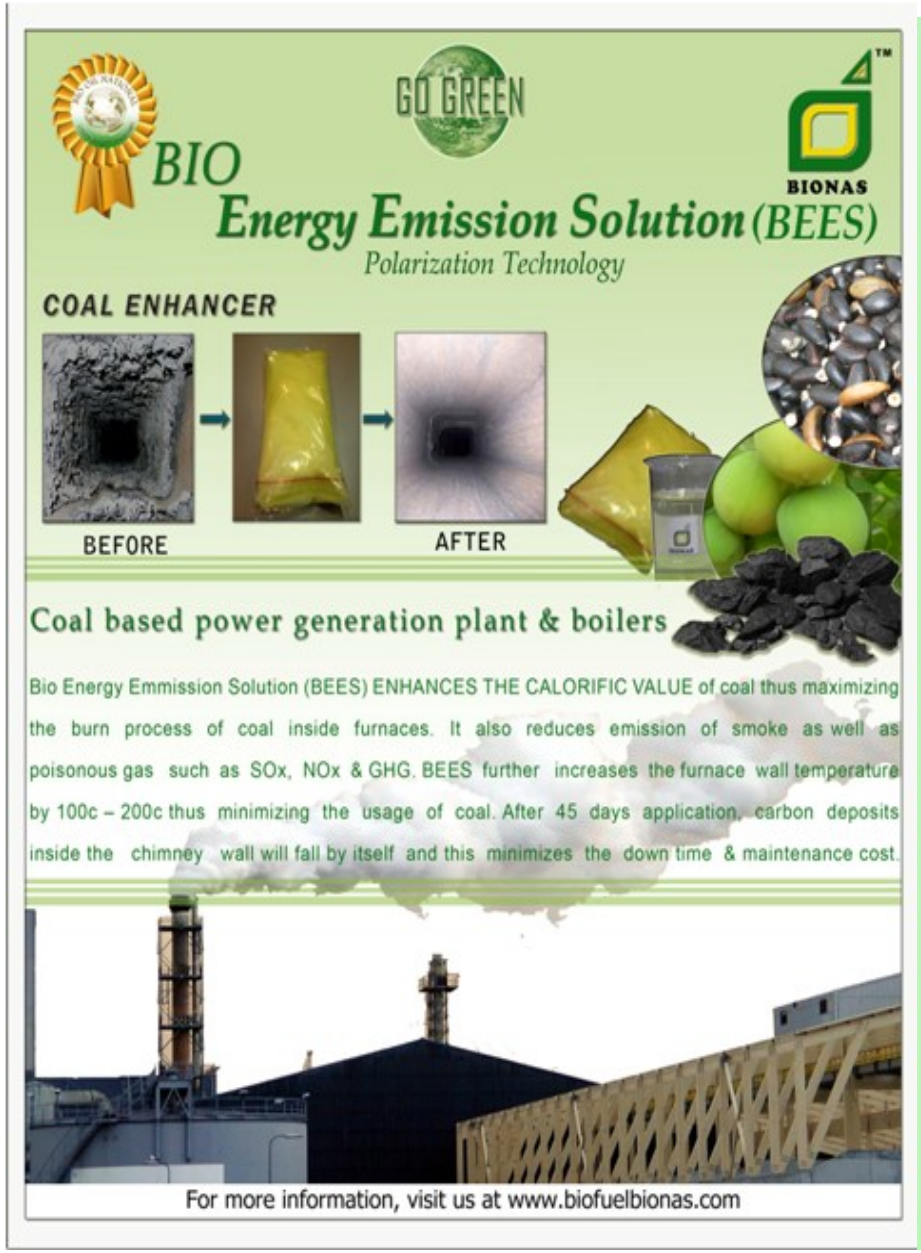
B25 Bio-Jet Fuel Commercial Flow Process

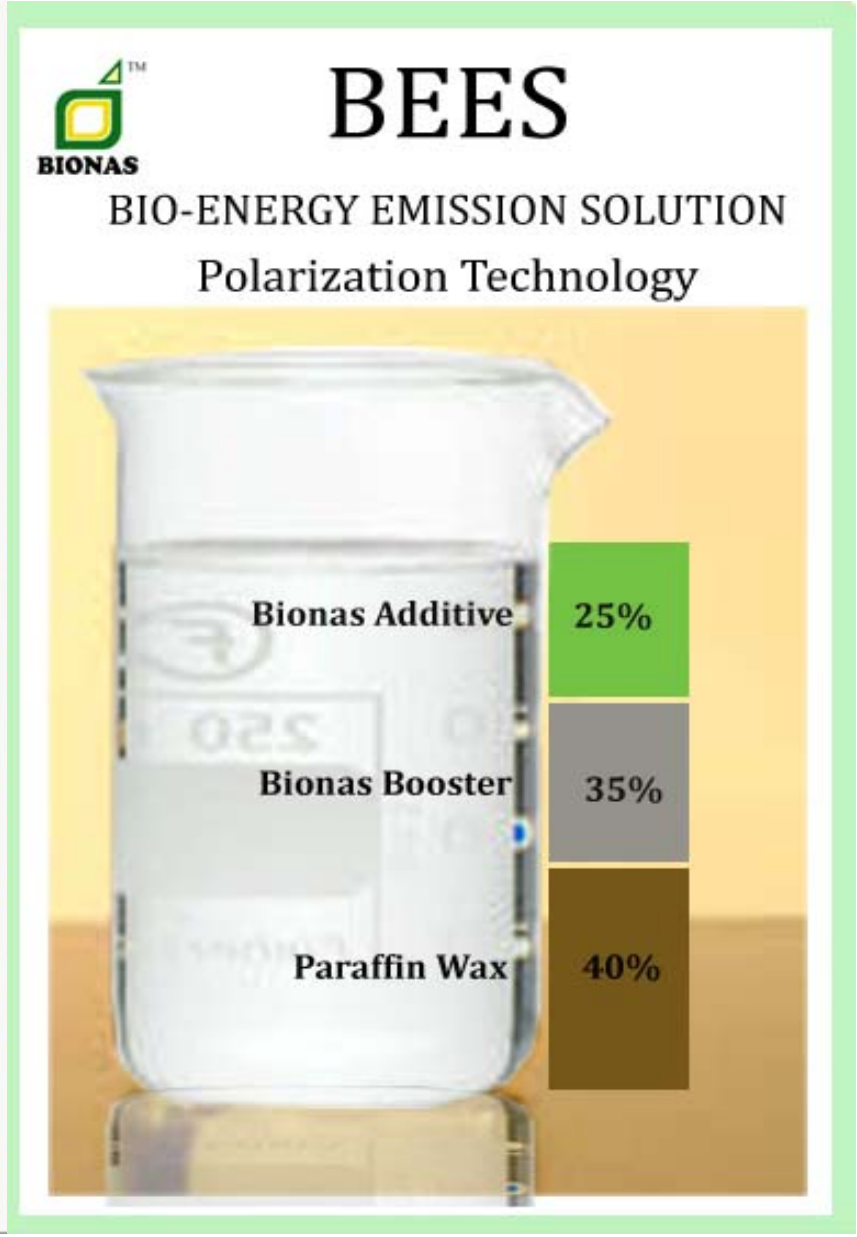
1. Bulk Terminal of associated Oil Company will supply Jet Fuel to airport storage facilities.
2. Bionas Additive is produced from Jatropha Extraction Mill and Bio-Fuel Processing Plant.
3. Bionas Addititve stored at airport storage facility, is ready for sale or export through air cargo.
4. A blending storage tank is needed to produce B25 Bio-Jet Fuel consisting of 75% Jet-Fuel and 25% Bionas Additive mixed with Booster 0.003%.
5. B25 Bio-Jet Fuel is ready for distribution to local and regional airports.

<u>Market Segmentation</u>

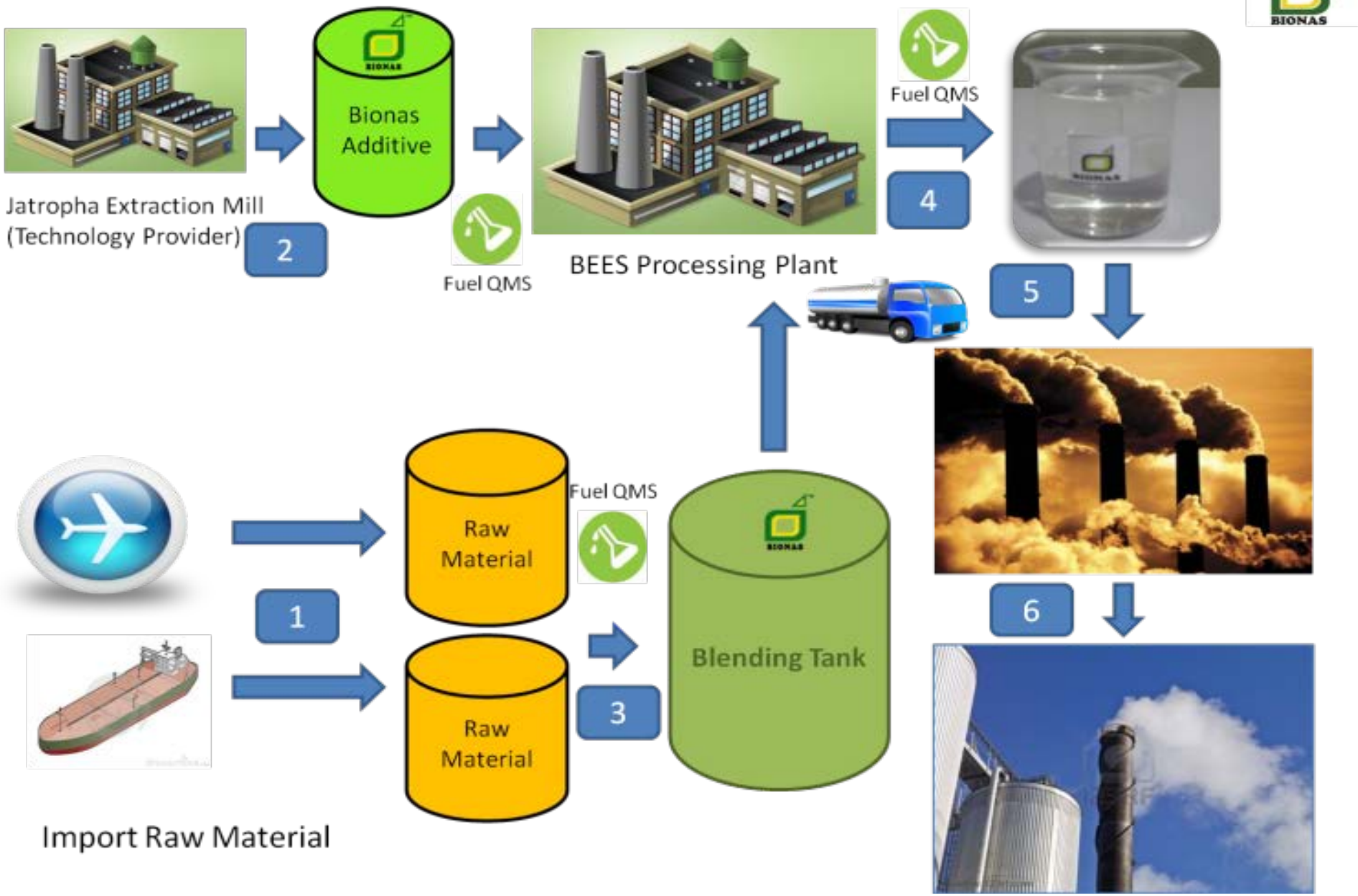
Aviation Industry.

Bio-Energy Emission Solution (BEES)





Bio-Energy Emission Solution (BEES) Commercial Flow Process



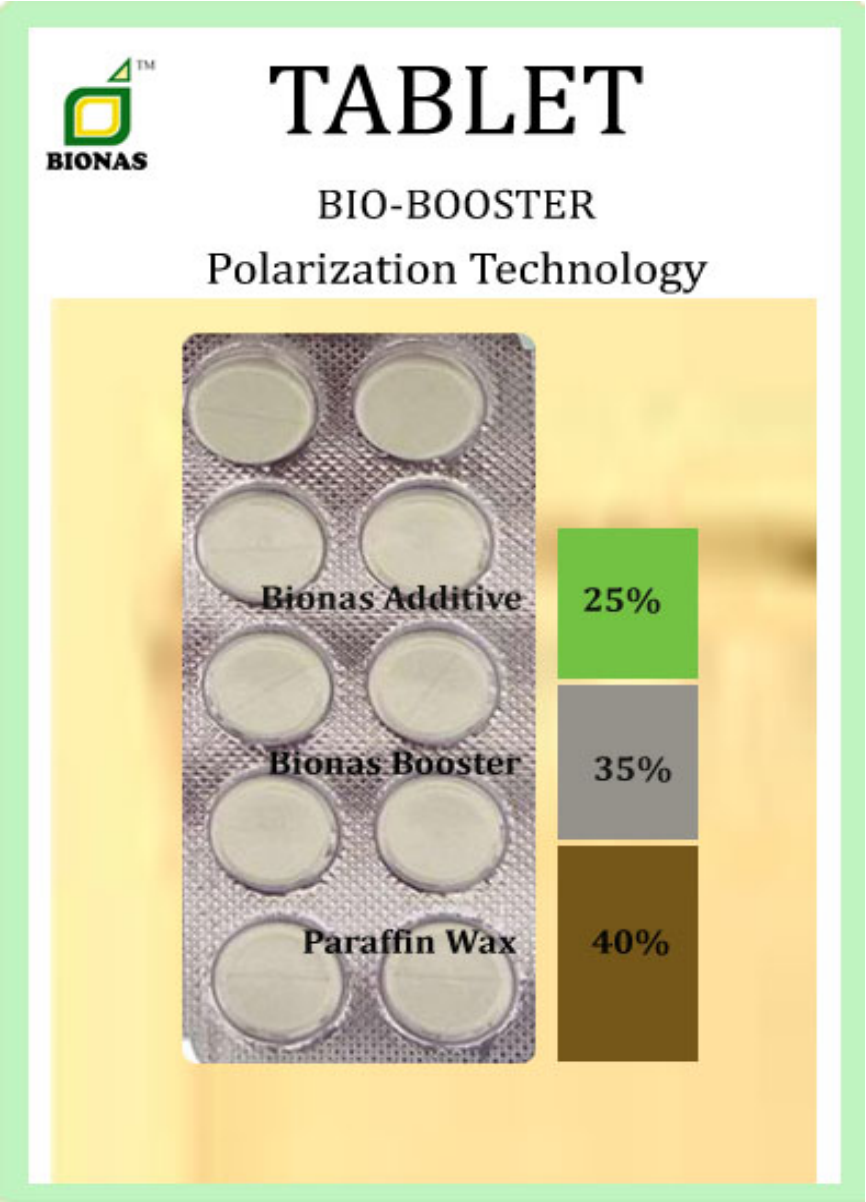
Bio-Energy Emission Solution (BEES)
Commercial Flow Process

1. Bionas imports necessary raw materials to its BEES processing plant to produce BEES.
2. Bionas Additive is mixed with blended raw materials from the Jatropha Extraction Mill.
3. Imported raw materials are blended in storage facilities before delivery to BEES processing plant.
4. BEES processing plant produces liquid BEES from blended raw materials.
5. BEES is ready for export and delivery to power plants and boilers.
6. BEES lower emissions from boilers, power plants drastically.

<u>Market Segmentation</u>

Coal based power generation plant & boilers.

Bio-Booster Tablet



Bio-Booster Commercial Flow

Jatropha Extraction Mill
(Technology Provider)

2

Bionas Additive

Fuel
QMS

Bio-Booster Processing Plant

Fuel
QMS

4

Powder Form

Tablet Form

5

1

Raw Material

Raw Material

Fuel
QMS

3

Blending Tank

Distribution to
Regional Airport

Distribution to
Petrol Station

Import Raw Material

Bio-Booster Commercial Flow

1. Bionas imports necessary raw materials to its Bio-Booster processing plant to produce Bio-Booster.
2. Bionas Additive is mixed with blended raw materials at the Bio-Booster processing plant.
3. Imported raw materials are blended in storage facilities before delivery to Bio-Booster processing plant.
4. Bio-Booster processing plant produces tablet and powder form of Bio-Booster from blended raw materials.
5. Bio-Booster is ready for export and distribution to local market in service station (Consumer) and regional airport.

Market Segmentation

Petrol and diesel based engines and aviation.

BIONAS BIO-BOOSTER TABLET SPECIFICATION

Analysis	Bio-Booster Tablet	Test Method
Appearance	White Crystal	Visual
Flash Point (°C)	82	ASTM D92
Sulphur (wt %)	n.d.	Element Analyzer
Total Acid Number (mg KOH/g)	0.0547	ASTM D974
Total Base Number (mg KOH/g)	0.13	ASTM D2896
Fire Point (°C)	84	ASTM D92

PROPOSED GLOBAL CLEAN ENERGY ECONOMY DEVELOPMENT PROGRAM

THE GLOBAL CLEAN ENERGY ECONOMY DEVELOPMENT PROGRAM							
BIONAS' OFFERING	BIONAS' BIOFUEL PRODUCTS	COMPOSITION				SAVE FOREIGN OIL IMPORTS (%)	REDUCE EMISSION (%)
		H2O (%)	METHANOL (%)	BIO -PORTION (%)	FOSSIL FUEL (%)		
1. Application of new technology.	B20 Bio-Petrol	10	-	10	80 (Petrol)	20	70 – 80
2. No further investment on facilities and infrastructures.	M30 Petrol	-	30	3	67 (Petrol)	33	70 – 80
3. Consumers save 5 – 10% on daily fuel consumption.	B10-B30 Bio-Diesel	-	5 – 15	10 – 30	70 – 90 (Diesel)	10 – 30	60 – 86
	Super Bio-Jet Fuel	-	-	1	99 (Jet Fuel)	-	60 – 82
4. Reduce emission with minimum 60%.	B10-B25 Bio-Jet Fuel	-	5 – 15	10 – 25	75 – 90 (Jet Fuel)	10 – 25	70 – 82
5. Establish new global economy and create new employment.	B25 Bio-Heavy Fuel	25	-	1	74 (Heavy Fuel)	26	70 – 82
	Hydro Diesel	25	-	1	74 (Diesel)	26	70 – 82

Bionas' offering for the Global Clean Energy Economy Development Program

* investments and new technology for renewable fuel;

* formulate the new formula using non-food based multi-feed stocks, water & methanol;

* implement the cost effective biofuel production system by utilizing the existing infrastructures, blending and storage facilities at existing refineries, port and depot;

* perform engine & emission test in collaboration with International Bodies, Government and Private who will involve in coordination and implementation of new technology; and

* set up a new standard for biofuel with emphasis on sustainability and economic development.