Biofuel Production
via
Nano-Emulsion and Polarization Technology

Presented by :
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4TH INTERNATIONAL CONFERENCE ON BIOFUELS STANDARDS:
CURRENT ISSUES, FUTURE TRENDS
13-15 November 2012 @ Gaithersburg, MD, USA
Organised by : National Institutes of Standard & Technology, USA

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

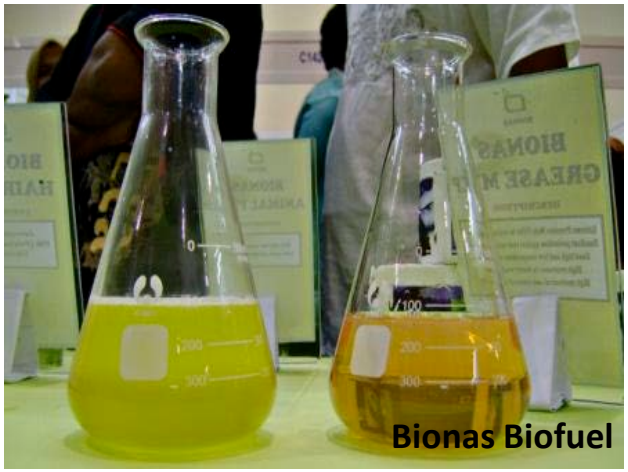
Savings on refinery (transesterification) is channeled to the farmers
by offering good buy back price of their harvest

BIONAS Supply Chain of Biofuel Production

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

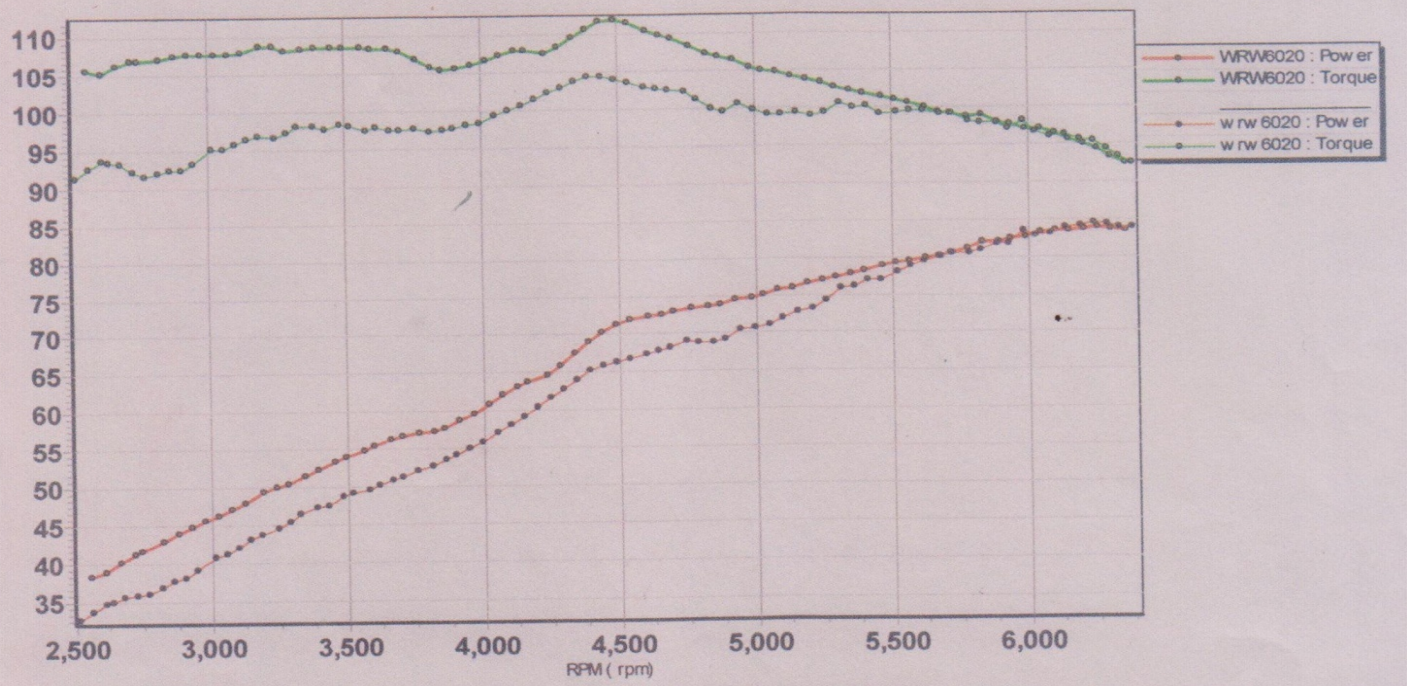
Links Dyno Tune

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

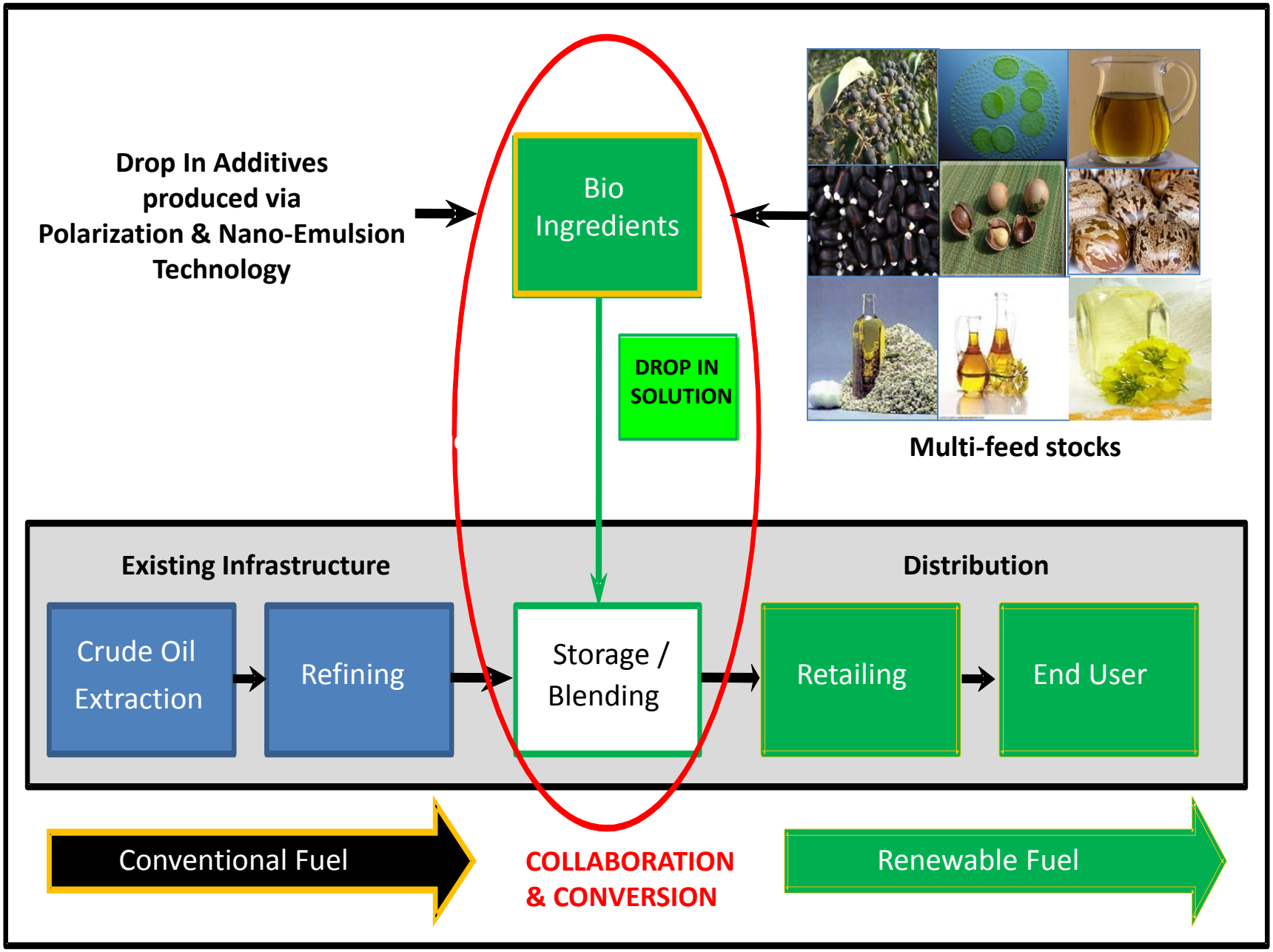
MOFAZ is a major name in the automotive scene in Malaysia & currently competing in the Formula1–Renault 3.5series.

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

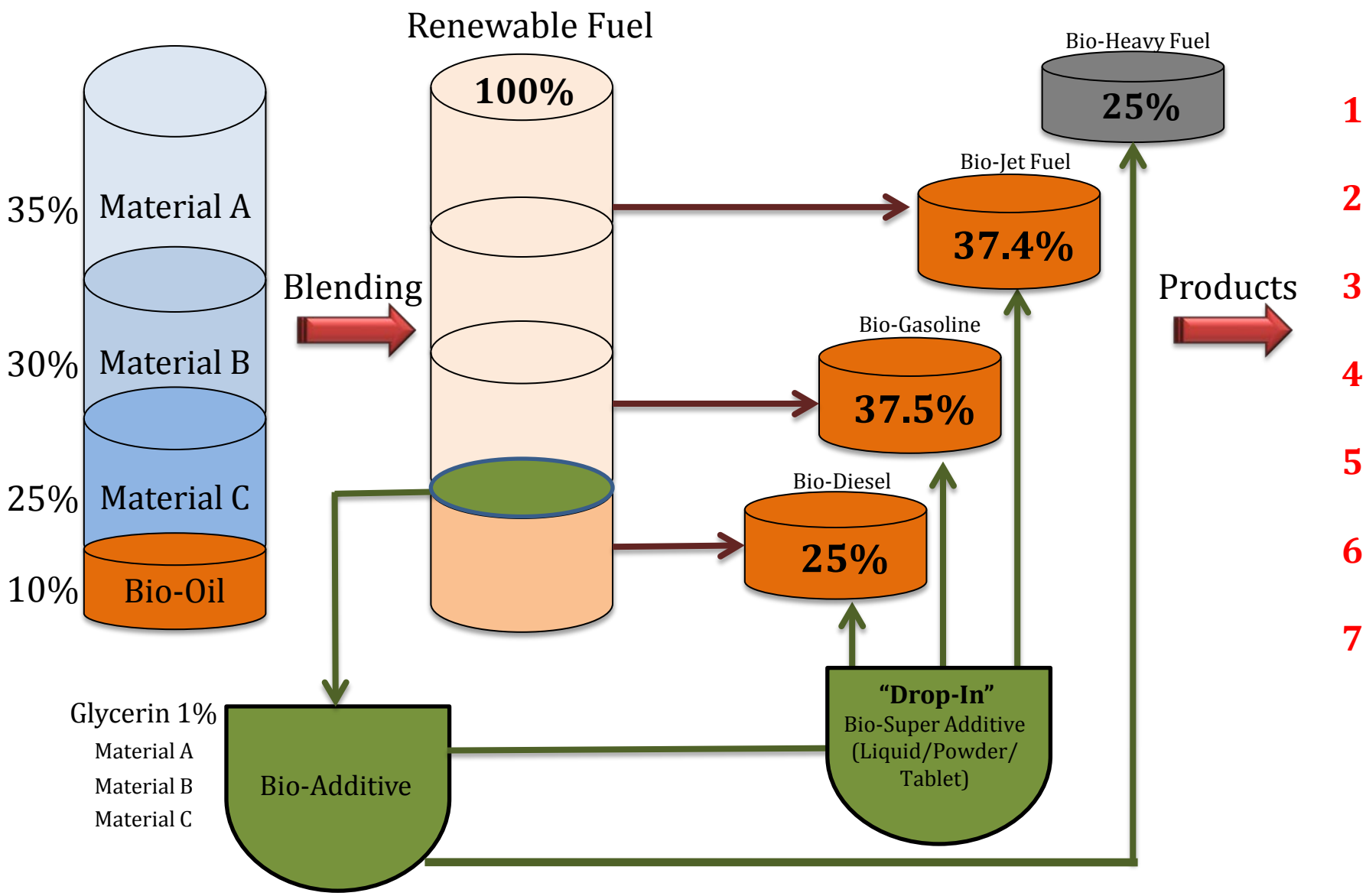
Collaboration and Conversion Process



MULTI FEEDSTOCK

1. Jatropha
2. Algae
3. Rapeseed Oil
4. Camelina
5. Used Cooking Oil
6. Cotton Seed Oil
7. Biomass
8. Swida Wilsonania (cold climate)

BIO-FUEL PROCESS FLOW DIAGRAM



Bionas Bio-Fuel Process Flow
via Nano-Emulsion & Polarization Technology

1. Bionas Additive is produced by multiplying 10% of Bio-Oil (Vegetable Oil) to 100% of Renewable Fuel/Additive for different types of fossil fuel in just one single line of production.

2. The first 25% fraction of renewable fuel used to produce additive for Bio-Diesel.

3. The second fraction (37.5%) of renewable fuel used to produce additive for Bio-Gasoline.

4. Another 37.4% fraction of renewable fuel used to produce additive for Bio-Jet Fuel.

5. The last 25% fraction of renewable fuel used to produce additive for Bio-Heavy Fuel.

6. Glycerin 1% used to produce Super Additive called Bio-Booster in the form of liquid, powder and tablet ("DROP IN")

7. Example of the calculation: 1MT of Bio-Oil (Vegetable Oil) can produce 10MT of Renewable Fuel/Additive for Bio-Gasoline, and can produce up to 100MT of B20 Bio-Gasoline at one time of production.

BIONAS BIOFUEL OFFERINGS

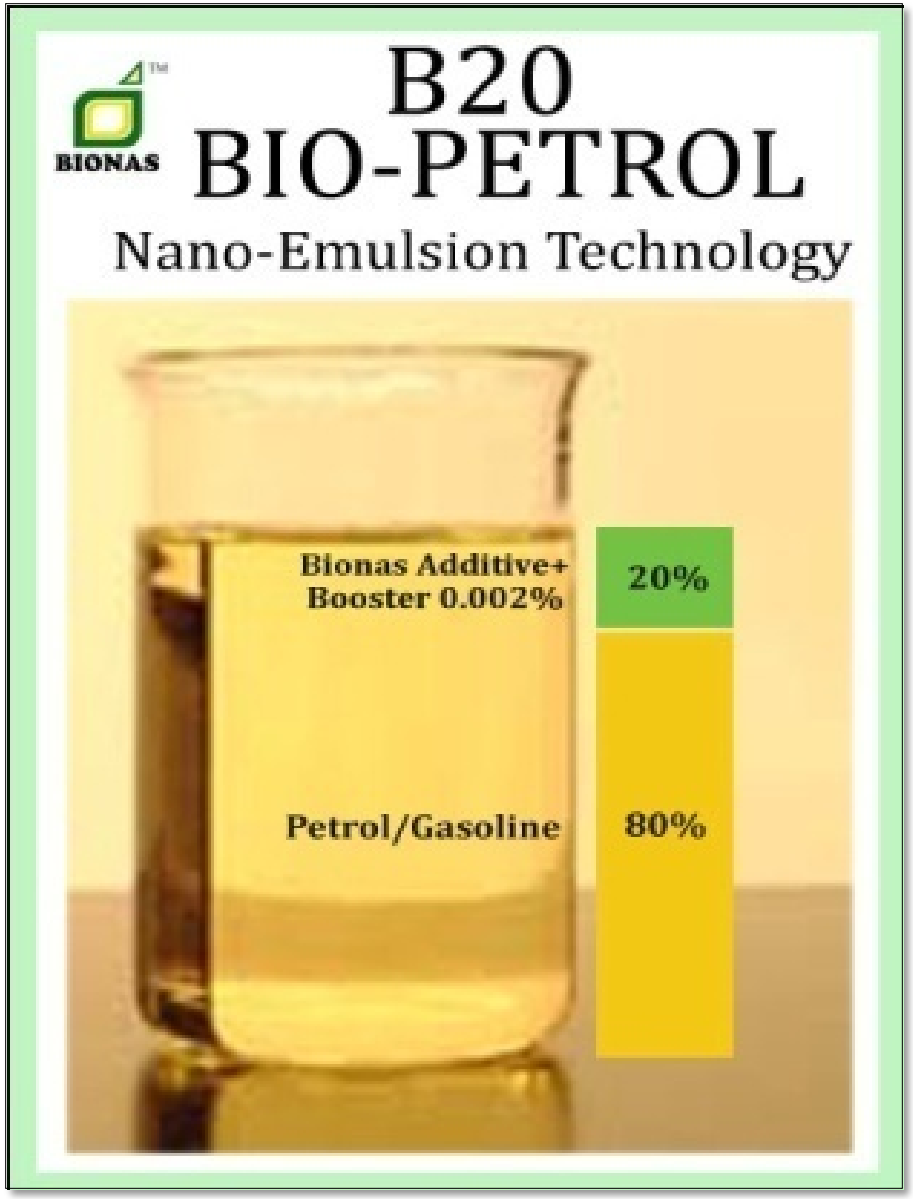
Processing, Logistic Infrastructure & Commercial Flow Structure

Bionas' Biofuel Products :-

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

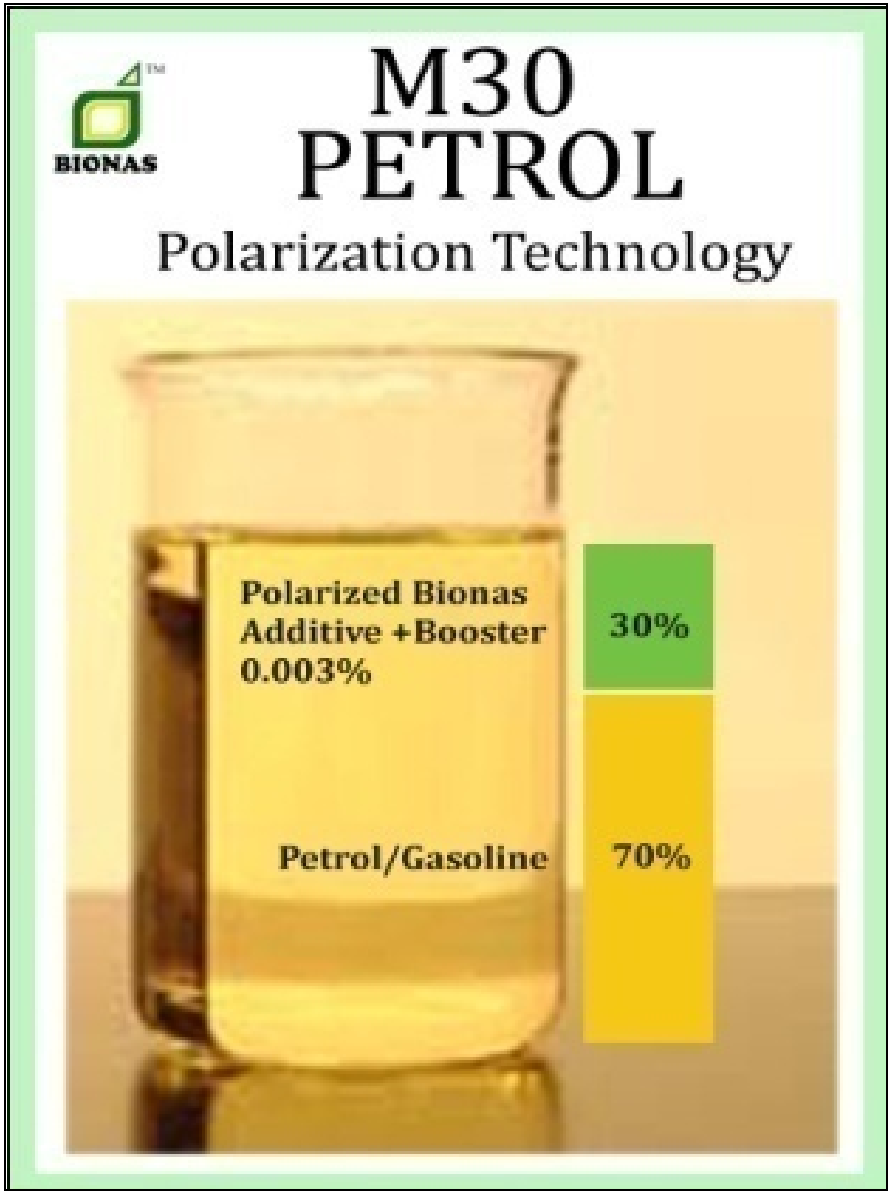
Produced via **Nano-Emulsion and Polarization Technologies**

B20 Bio-Petrol

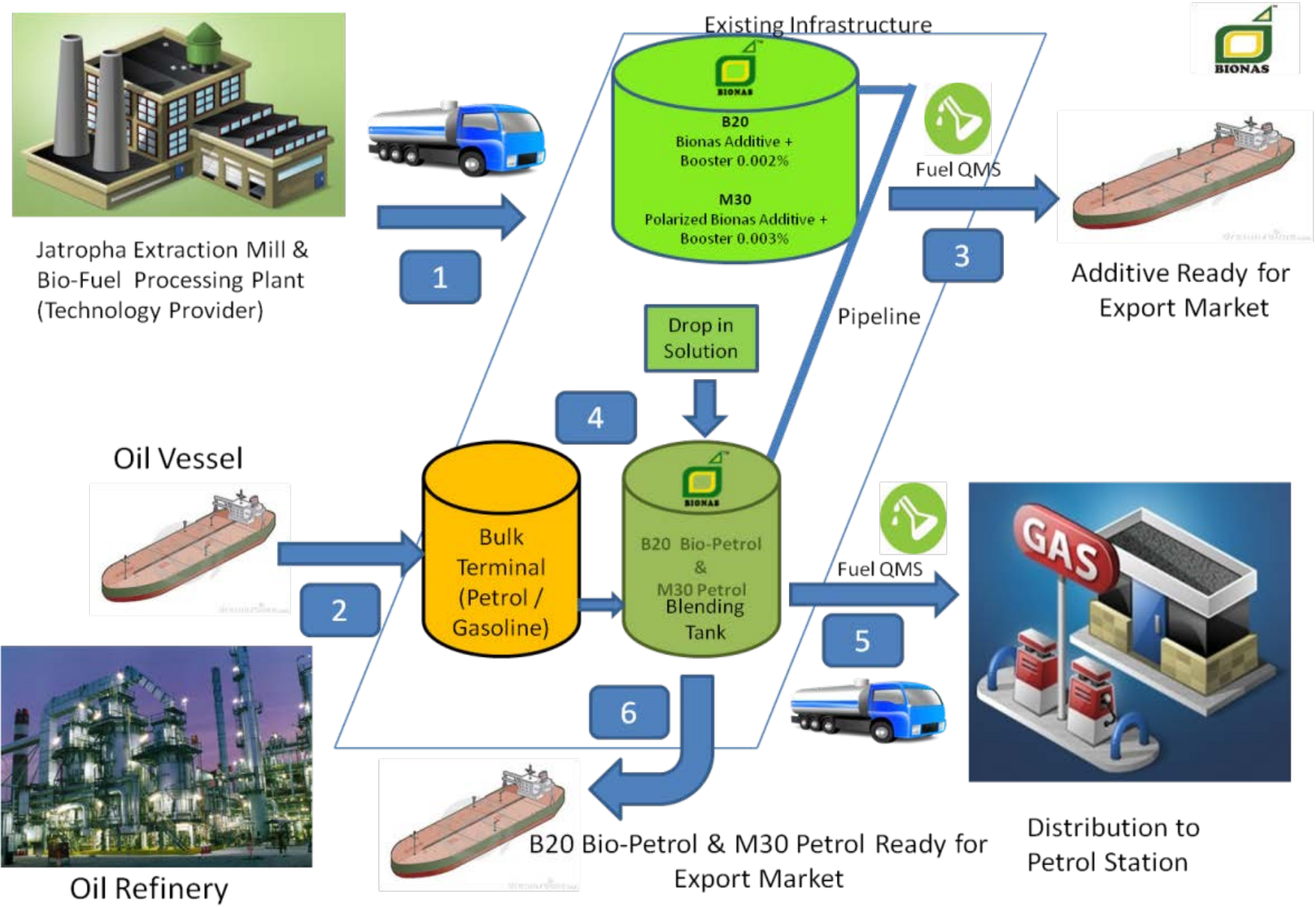


M30 Petrol

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.

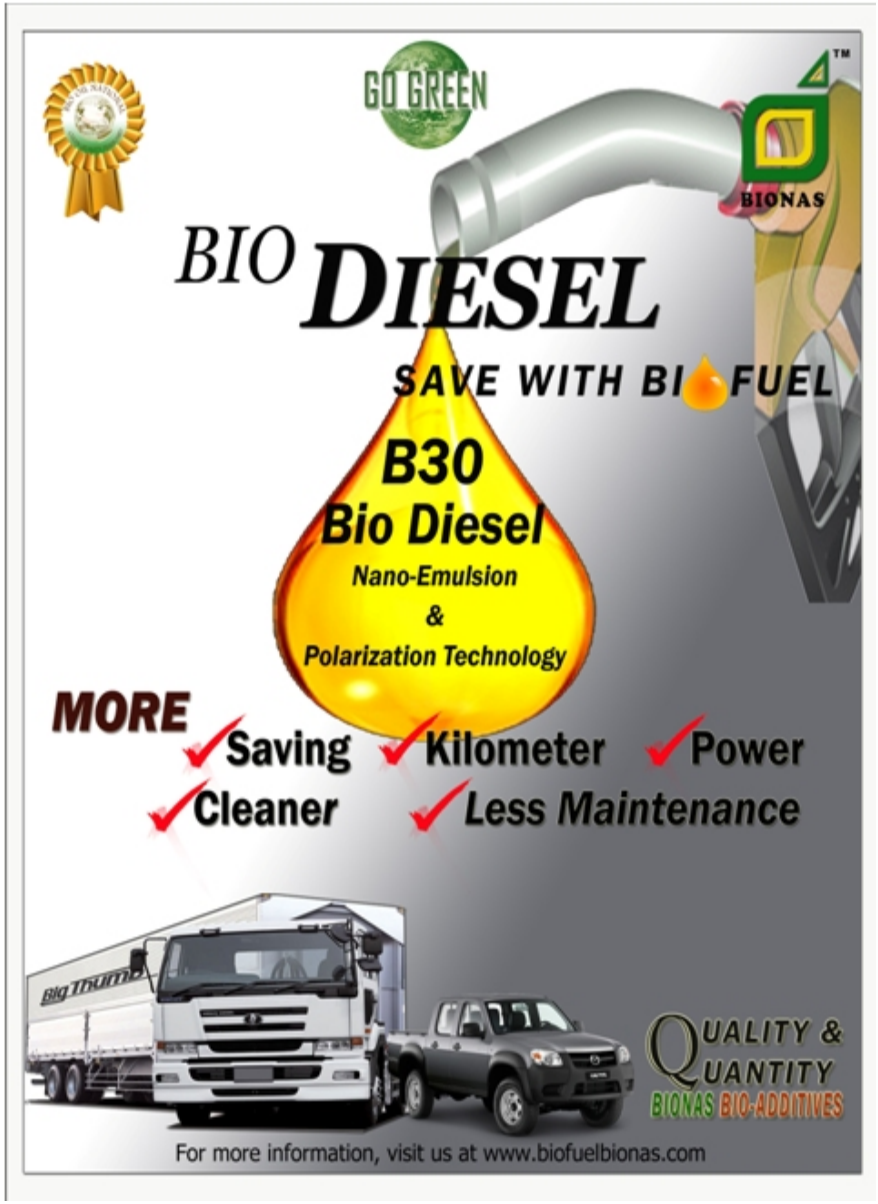
<u>Market Segmentation</u>

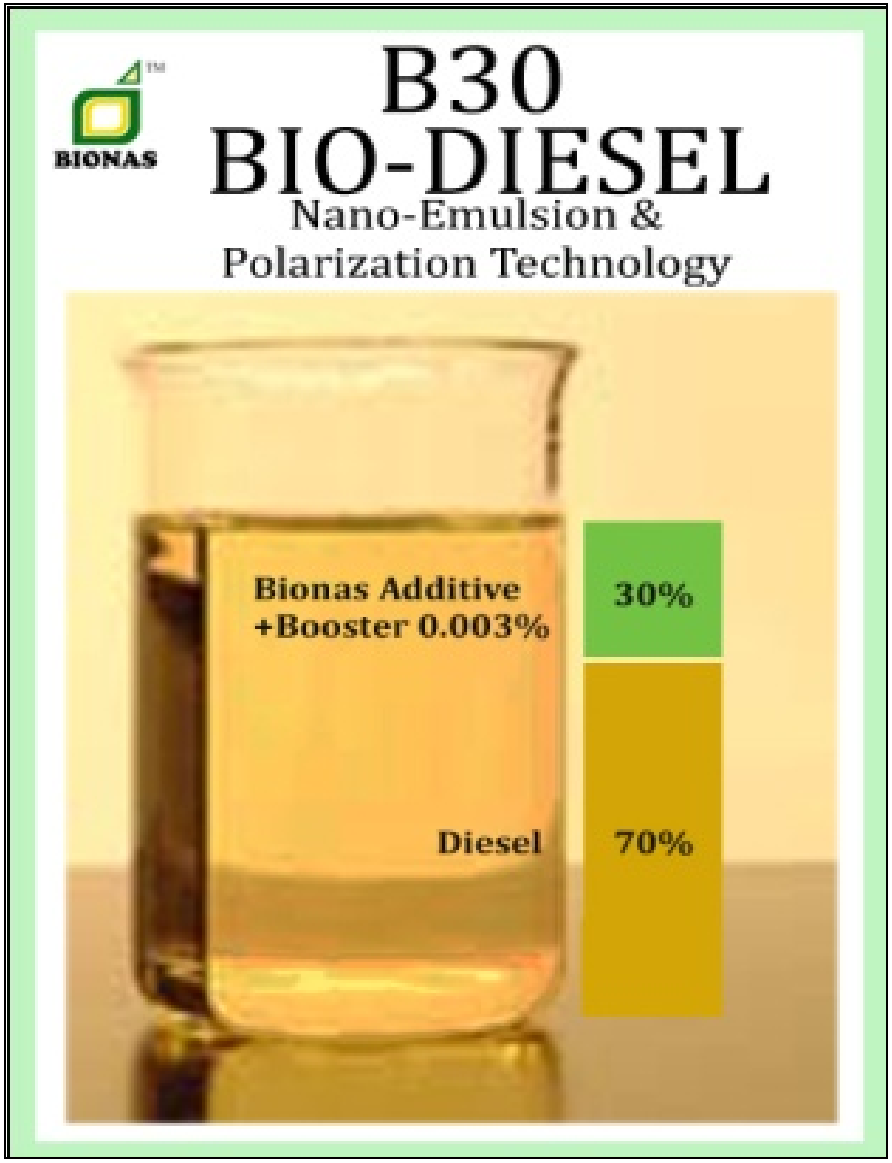
Petrol based internal combustion engines i.e. Automobiles, Motorcycles, etc.

BIONAS B20 BIO-PETROL & M30 PETROL SPECIFICATION

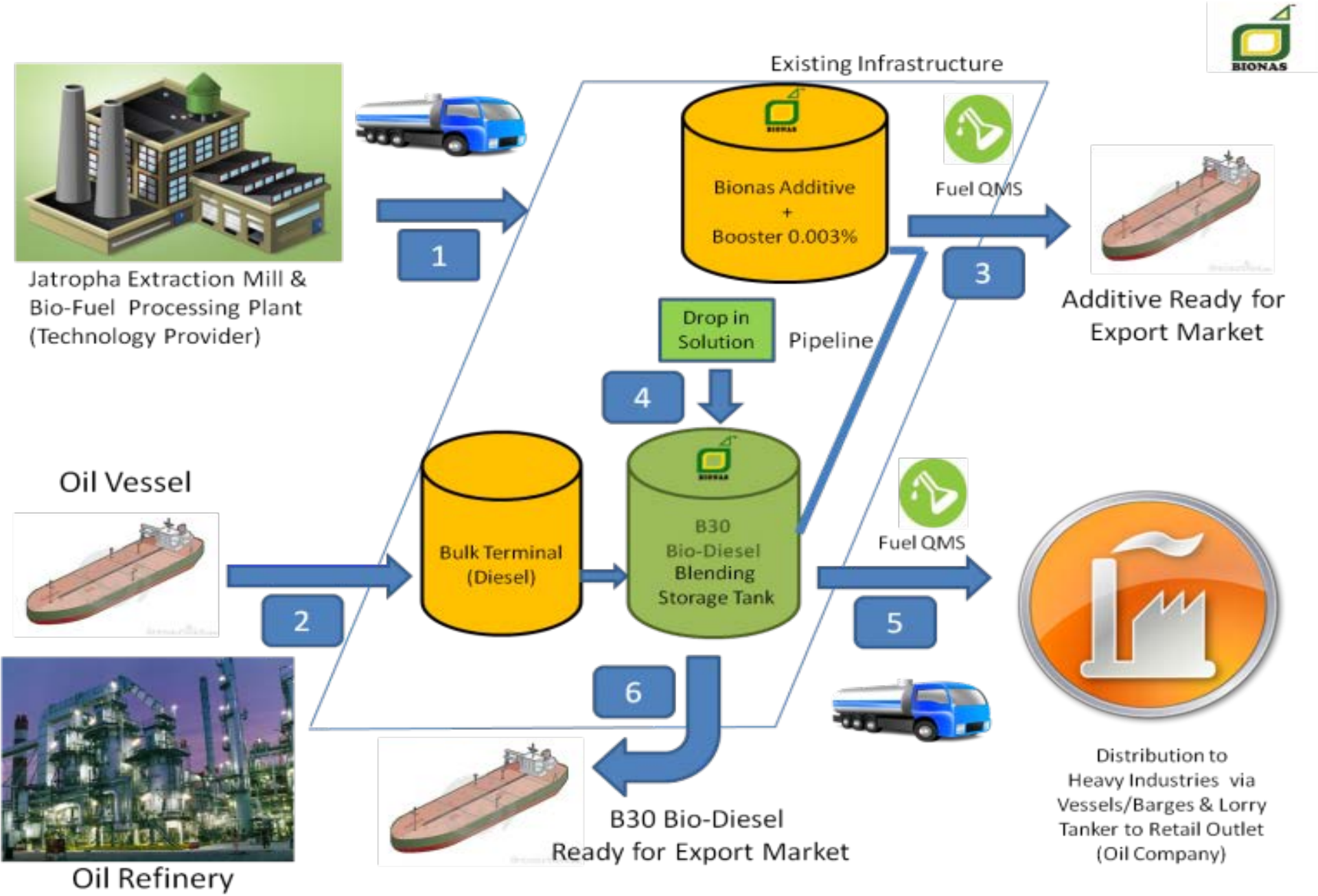
Analysis	B20 Bio-Petrol	M30 Petrol	ASTM Standard (Petrol)	Test Method
Density @ 15°C (kg/L)	**0.780**	**0.778**	0.710 – 0.785	ASTM D1298
Appearance	**Clear**	**Clear**	Clear	Visual
Distillation:				
IBP (°C)	**53**	**51**	Max: 70	ASTM D86
90% (°C)	**162**	**141**	Max: 180	ASTM D86
FBP (°C)	**190**	**177**	Max: 205	ASTM D86
Residue (Vol%)	**2**	**0.5**	Max: 2	ASTM D86
Sulphur (ppm)	**1.84**	**0.84**	Max: 15	ASTM D5453
RON	**105.0**	**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.

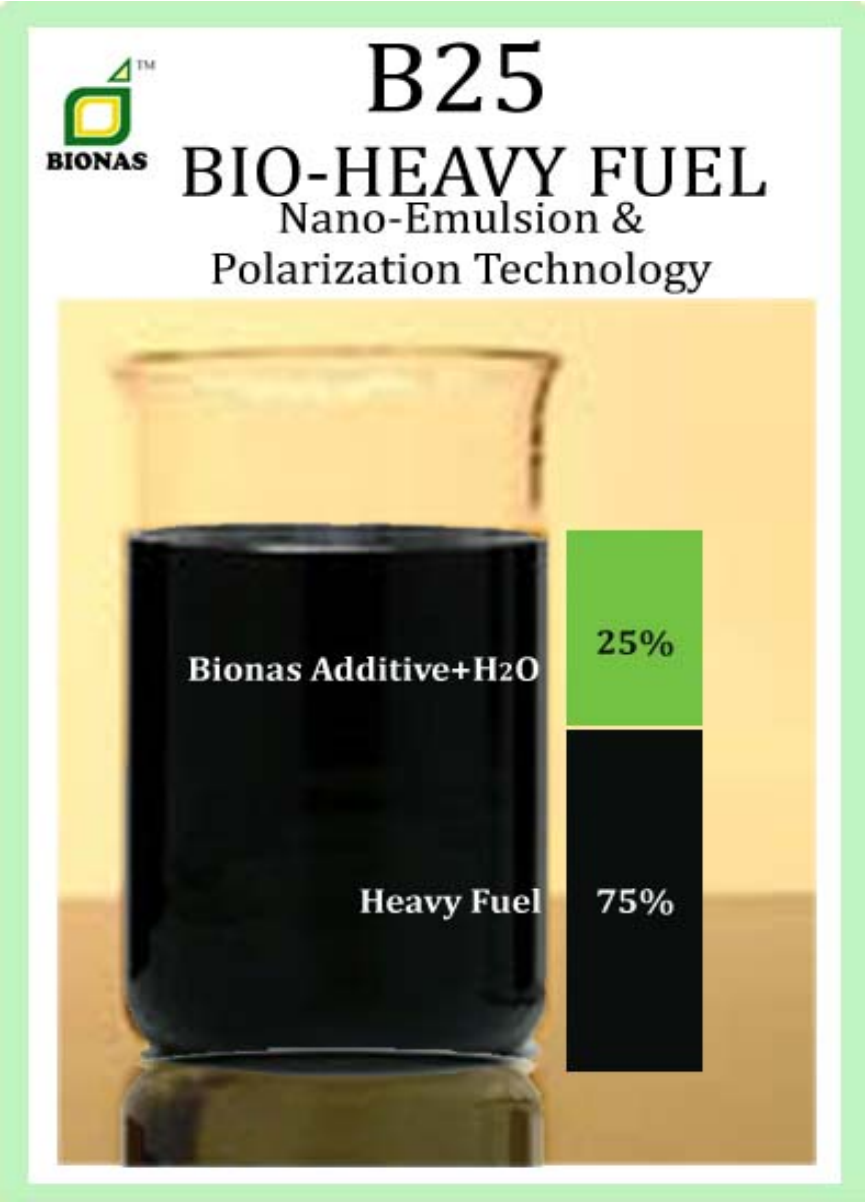
<u>Market Segmentation</u>

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

Distribution to Heavy Industries via Vessels & Road Transport

Oil Refinery

6

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.

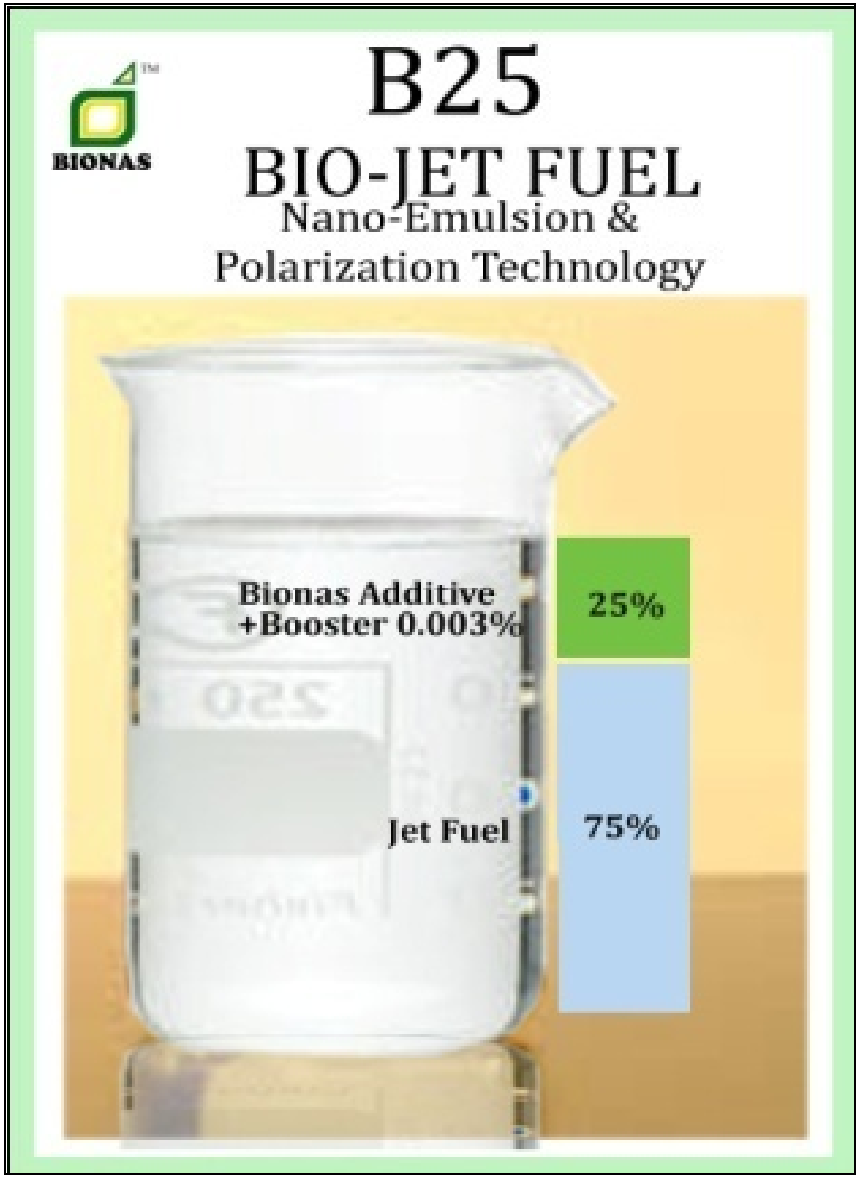
<u>Market Segmentation</u>

Shipping & Heavy Industry.

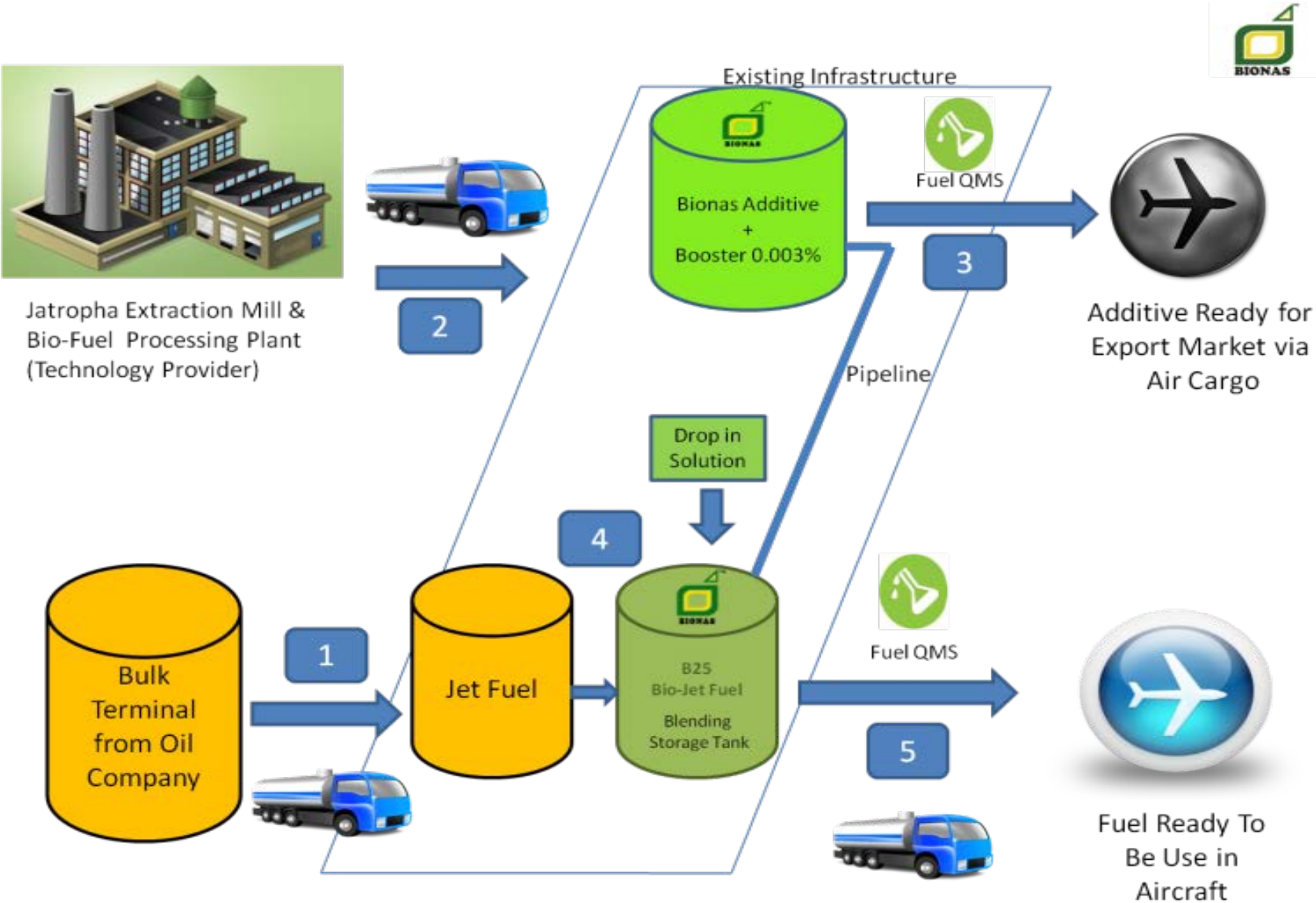
BIONAS B25 BIO-HEAVY FUEL SPECIFICATION

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 Additive 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.

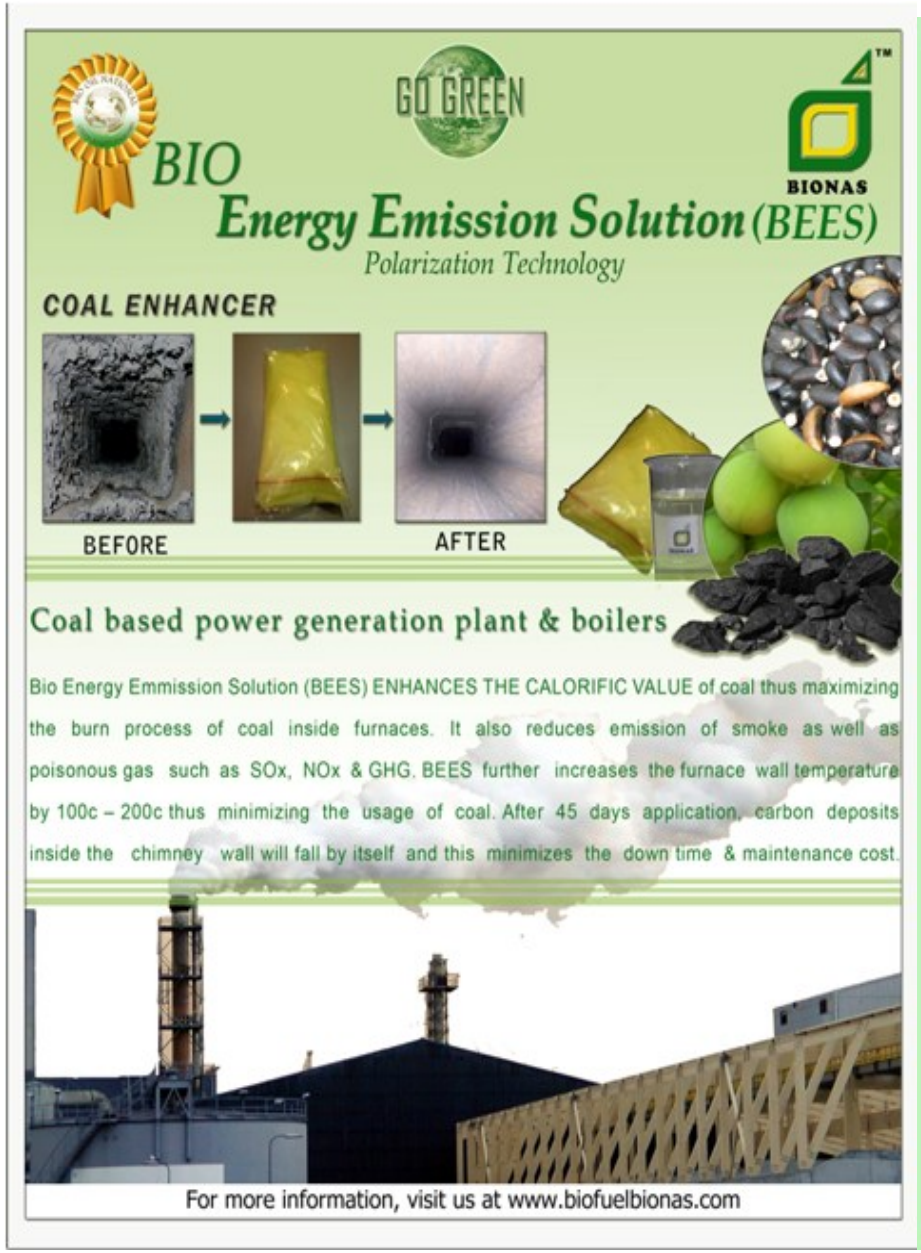
<u>Market Segmentation</u>

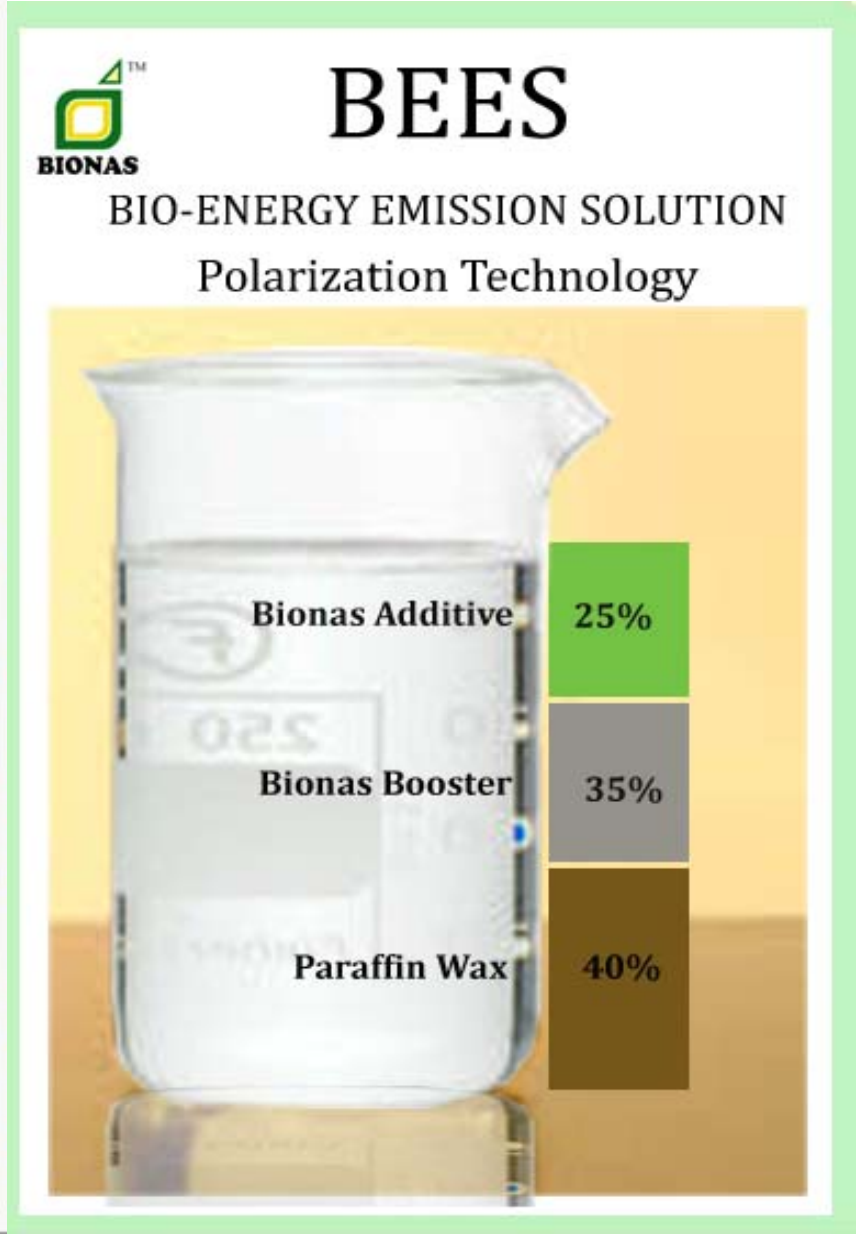
Aviation Industry.

BIONAS B25 BIO-JET FUEL SPECIFICATION

Analysis	B25 Bio-Jet Fuel	ASTM Standard (Jet A1)	Test Method
Density at 15°C (kg/L)	**0.775**	0.775 – 0.840	ASTM D4052
Flash Point (°C)	**39**	Min: 38	ASTM D56
Kinematic Viscosity @40°C (cSt)	**1.80**	1.0 – 2.0	ASTM D445
Freezing Point (°C)	**-45**	Max: -47	ASTM D2386
Distillation Temperature (°C)	**289**	Max: 300	ASTM D86
Sulphur (% mass)	**3.0**	Max: 3.5	ASTM D129
Polycyclic Aromatic Hydrocarbon (%)	**22**	Max: 25	ASTM D6591
Copper Strip Corrosion 3hrs @ 50 °C (Ma. No.1)	**1A**	1A	ASTM D 130
Auto-Ignition Temperature (°C)	**220**	0.05	ASTM E659
Vapour Pressure @ 20 °C (hPa)	**0.85**	Max: 1	ASTM D323

Bio-Energy Emission Solution (BEES)





Bio-Energy Emission Solution (BEES) Commercial Flow Process

Jatropha Extraction Mill
(Technology Provider)

2

Bionas Additive

Fuel QMS

BEES Processing Plant

Fuel QMS

4

5

6

1

Import Raw Material

Raw Material

Raw Material

Fuel QMS

3

Blending Tank

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.

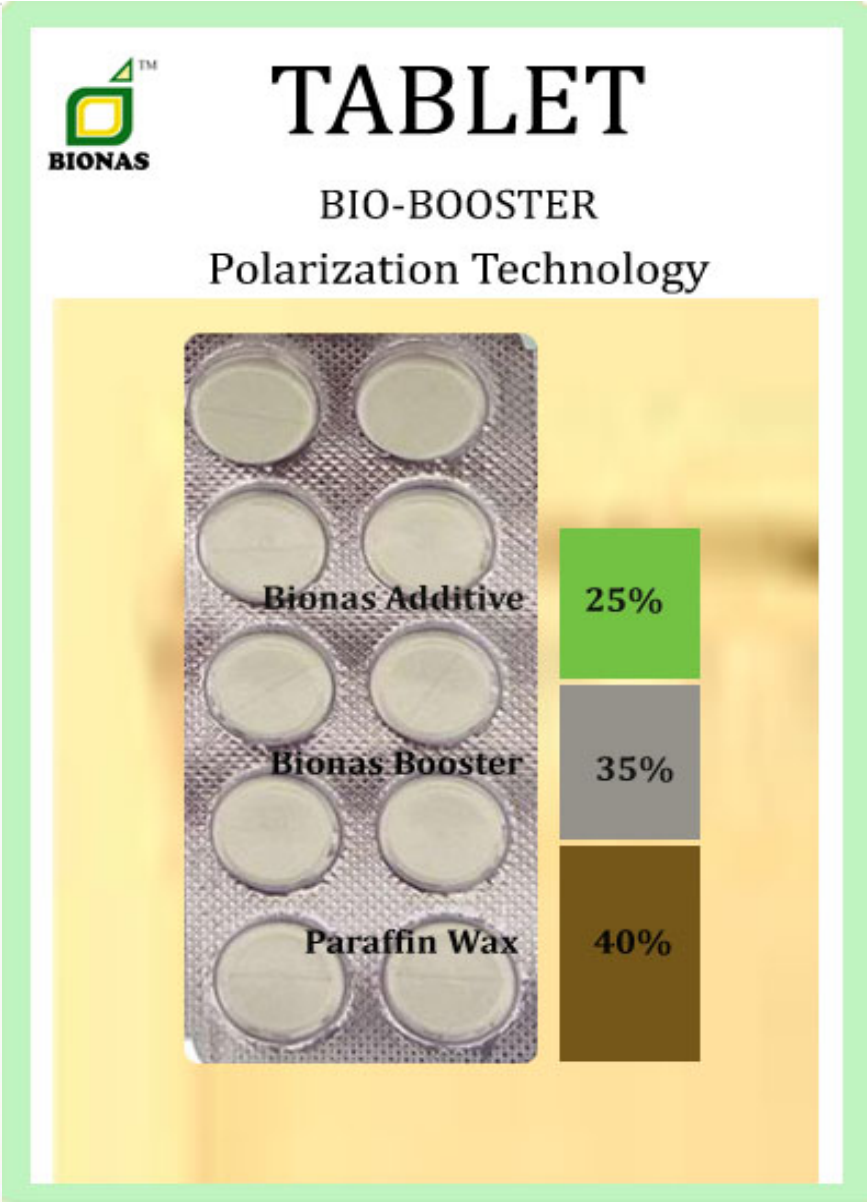
<u>Market Segmentation</u>

Coal based power generation plant & boilers.

BIONAS BIO-ENERGY EMISSION SOLUTION (BEES) SPECIFICATION

Analysis	BEES	Test Method
Melting Point (°C)	**59.7**	ASTM D87
Oil Content (%)	**0.63**	ASTM D721
Color	**+17**	ASTM D6045
Needle Penetration at 25 °C (1/10 mm)	**17**	ASTM D1321
Kinematic Viscosity at 100 °C (mm2/s)	**4.323**	ASTM D445
Odor	**2**	ASTM D1833

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 (^{o}C)	**84**	ASTM D92

PROPOSED GLOBAL CLEAN ENERGY ECONOMY DEVELOPMENT PROGRAM

THE PROPOSED 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. 2. No further investment on facilities and infrastructures. 3. Consumers save 5 – 10% on daily fuel consumption. 4. Reduce emission with minimum 60%. 5. Establish new global economy and create new employment.	B20 Bio-Petrol	10	-	10	80 (Petrol)	20	70 – 80
	M30 Petrol	-	30	3	67 (Petrol)	33	70 – 80
	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
	B10-B25 Bio-Jet Fuel	-	5 – 15	10 – 25	75 – 90 (Jet Fuel)	10 – 25	70 – 82
	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

*implementing new technology for biofuel & renewable fuel;

*formulating the new formula using non-food based multi-feed stocks, H2O & methanol;

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

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

* setting up a new standard for biofuels with emphasis on sustainability and economic development.

SOLUTION TO IP ISSUES

- Bionas offers technology collaboration.
- Offer individual product test subject to satisfy the needs of all engaged sector.
- Offer to license and register the technology and products
- Offer the standardization of production process.