

# Waste to Energy

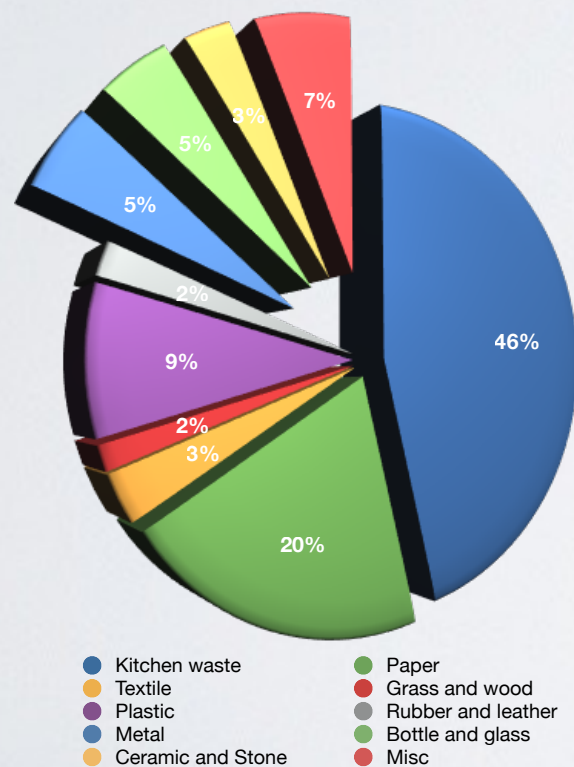
## Technology Choices

Manila 2018

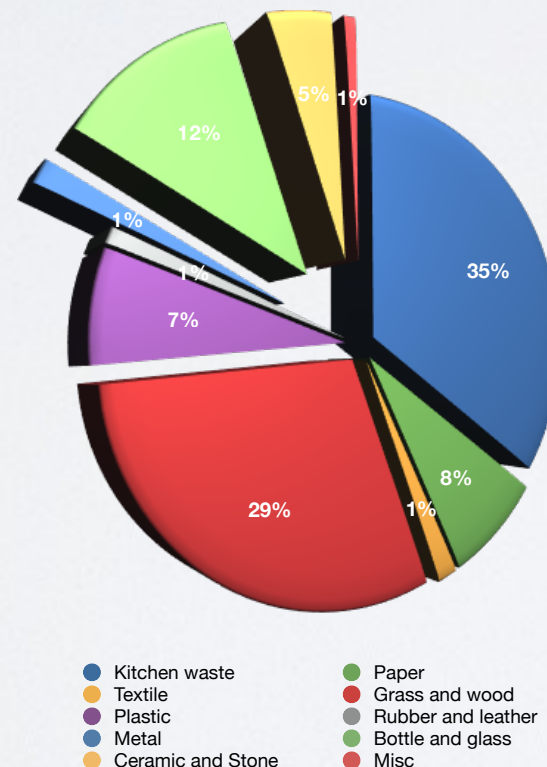


# Different markets, different needs

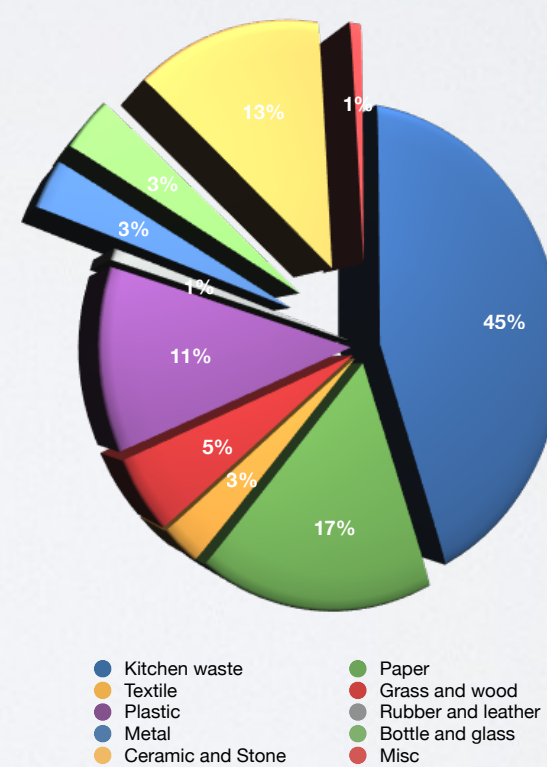
Market	MSW rate	MSW	Collect	Inerts	FE	NF	Water	Ener.	Heat	Price	Electr	Price	Income
	<i>kg/cap/d</i>	<i>tpd</i>			<i>\$180</i>	<i>\$1000</i>		<i>MJ/kg</i>	<i>MW</i>	<i>USD</i>	<i>MW</i>	<i>USD</i>	<i>USD per year</i>
Athens	1,1	110	90 %	15 %	2,6 %	0,3 %	30 %	21	8,4	0,02	<b>4,5</b>	0,2	<b>8 728 134</b>
Sofia	1	100	80 %	19 %	1,2 %	0,3 %	30 %	20	6,1	0,02	<b>3,3</b>	0,2	<b>6 409 006</b>
Montevideo	0,9	90	70 %	19 %	2,6 %	0,3 %	30 %	20	4,8	0	<b>2,6</b>	0,17	<b>3 637 826</b>
Katmandu	0,5	50	50 %	5 %	0,5 %	0,1 %	40 %	18	1,7	0	<b>0,9</b>	0,12	<b>913 541</b>



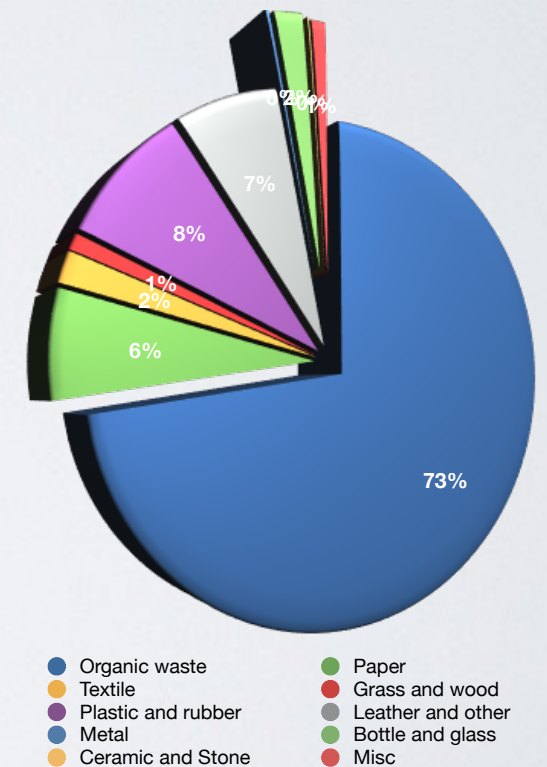
**Athens**



**Sofia**



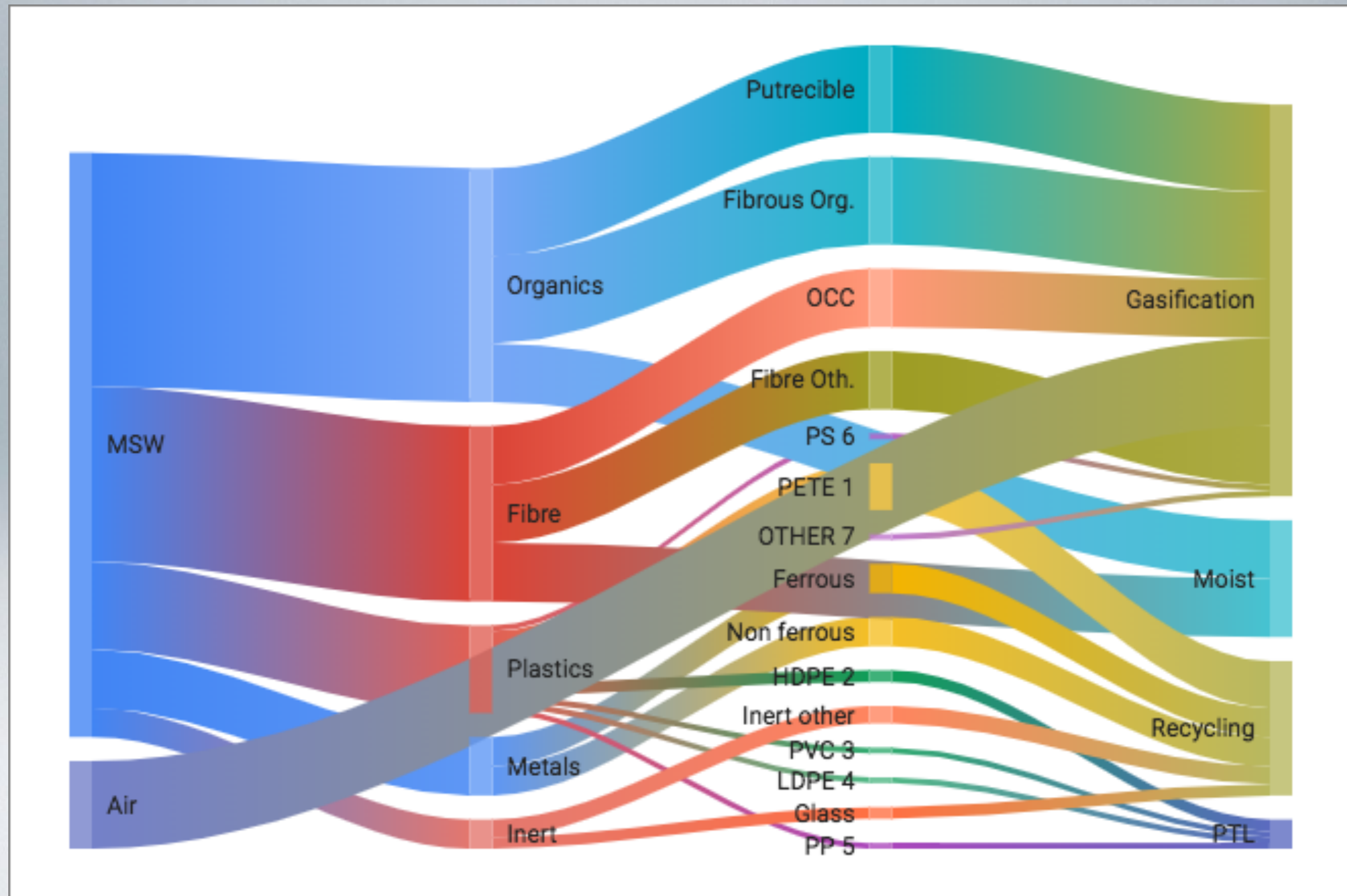
**Montevideo**



**Katmandu**



# The key to waste treatment is in the sorting



# PTL plastic-to-liquid fuels

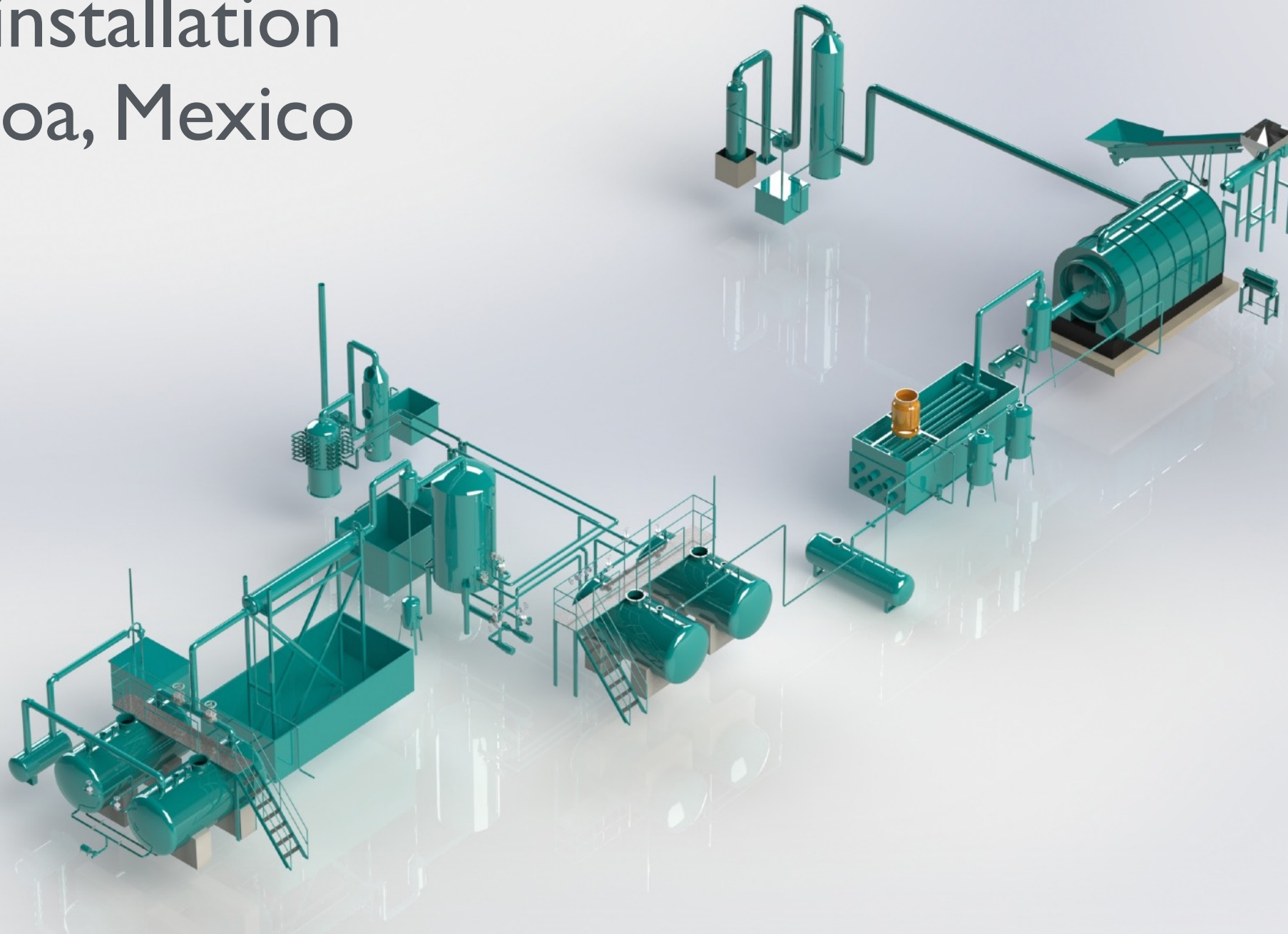
- Complement to MSW to RDF gasification
- Better use of plastic waste (CO<sub>2</sub> neutral)
- Shorter route to synthetic diesel
- Shorter return of investment - low entry threshold
- In operation Q2 2016





# FROM THEORY TO PRACTICE

First installation  
Navojoa, Mexico





# MODIFIED PYROLYSIS





# REPORT OF ANALYSIS

Date of Report	APRIL 11TH, 2017
Intertek Reference Number	MX01146-0000569
Vessel Name	NOT APPLICABLE
Port / Terminal	NOT APPLICABLE
Report Number	LAC-0474/17
Client Reference Number	NOT APPLICABLE

Customer Name
Customer Address
Customer Sample Description
Sampling Place
Drawn by
Analyzed by
Witnessed by (*)
Submitted by
Sample ID (Identification of the Sample Depending of the Customer)
Sample Number (Sequencing of Samples)
Date and Time of Sample
Date and Time of Reception
Date and Time of Analysis

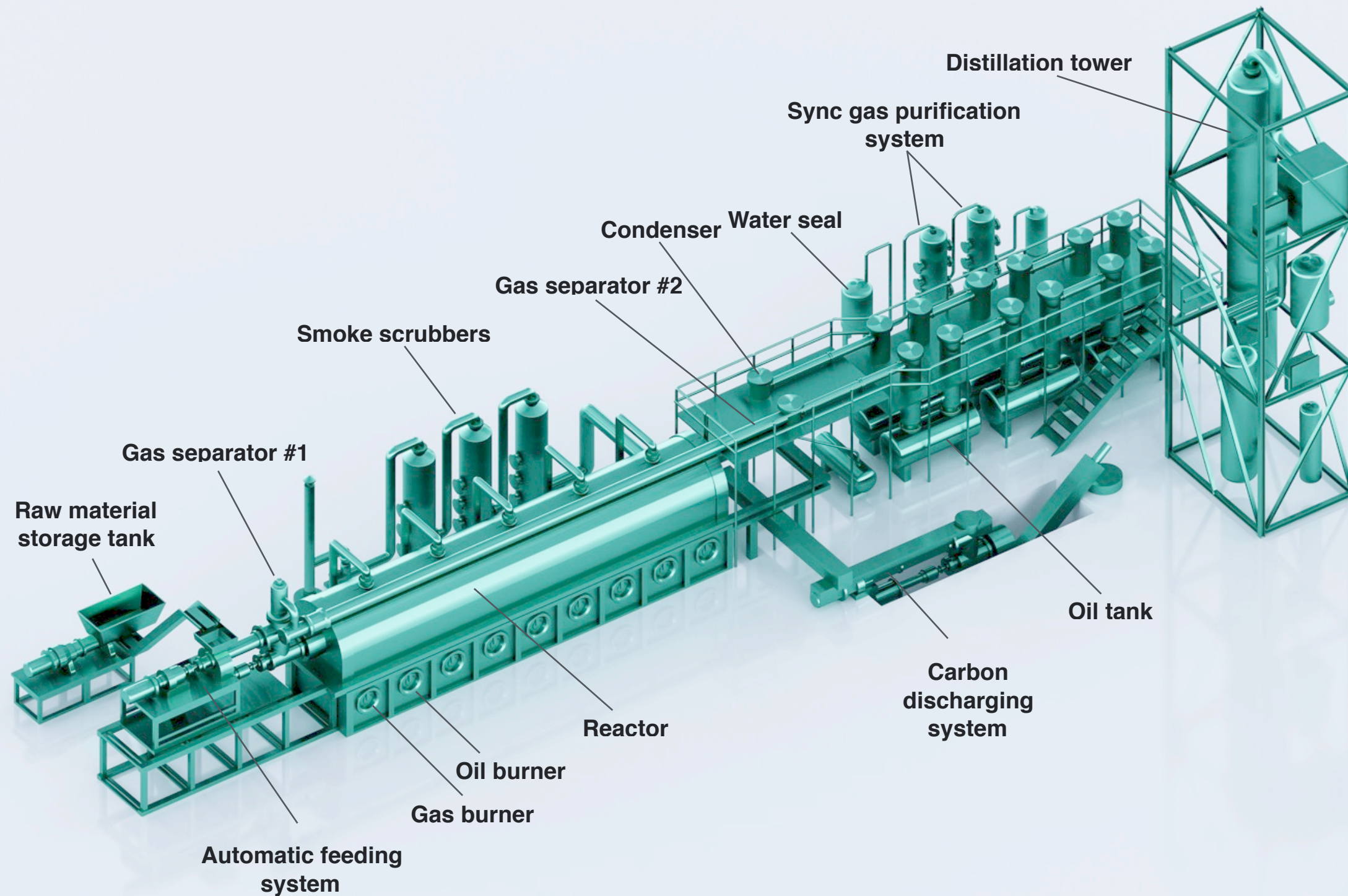
Diesel EN590 compliant  
 15–55 % less NO<sub>x</sub>  
 Less than 1 ppm SO<sub>x</sub>

DIESEL D3 (MUESTRA #03)
MX01146-0000569-C
MARCH 28TH, 2017      From: NOT DATA    To: NOT DATA
APRIL 07TH, 2017      16:00
APRIL 10TH TO 11TH, 2017      From: 09:30    To: 11:00

No.	Test Description	Method	Specification	Units	Results
1	KINEMATIC VISCOSITY AT 40°C (+)	ASTM D 445-15a	1,9 - 4,1	mm <sup>2</sup> /S	2,008
2	FLASH POINT (+)	ASTM D 93-16	45 MIN.	°C	62,0
3	SULFUR CONTENT (+)	ASTM D 5453-16	500 MAX.	mg/kg	144
4	INITIAL BOILING POINT (+)	ASTM D 86-15	TO REPORT	°C	168,4
	AT 10% (+)	ASTM D 86-15	275 MAX.	°C	202,9
	AT 50% (+)	ASTM D 86-15	TO REPORT	°C	255,5
	AT 90% (+)	ASTM D 86-15	345 MAX.	°C	302,5
	FINAL BOILING POINT (+)	ASTM D 86-15	TO REPORT	°C	333,0
	PCT. RECOVERED (+)	ASTM D 86-15	TO REPORT	-	98,4
	PCT. RESIDUE (+)	ASTM D 86-15	TO REPORT	-	1,4
5	DENSITY AT 15°C (+)	ASTM D 4052-15	TO REPORT	kg/L	0,825 6
	SPECIFIC GRAVITY AT 60°/60° (+)	ASTM D 4052-15	TO REPORT	-	0,826 0
6	CETANE INDEX (+)	ASTM D 976-06 (2016)	45 MIN.	-	52,93



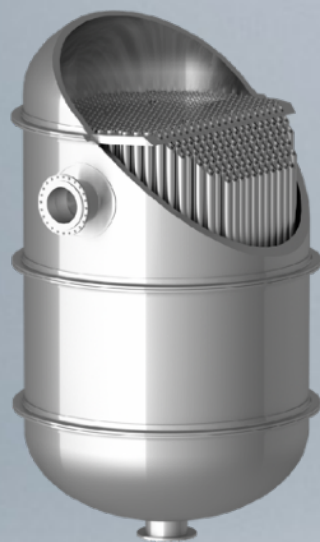
# CONTINUOUS PTL





# FUTURE APPLICATIONS

Biomass to Liquid fuels



Associated gas to Liquid fuels



Marine application, ocean plastic waste to marine diesel

