

The Future of Biofuels in Colombia

Meeting of the ISCC Regional Stakeholder Committee Latin America, Bogotá 19/02/2019



Fede Biocombustibles



**TOWARDS A
CARBONLESS WORLD**

Carlos Alberto Mateus H.

WHO WE ARE

- The **Colombian National Federation of Biofuels** is the unique association of biofuels producers in the country.
- Represents the 100% of ethanol producers and 90% of biodiesel producers
- The production plants – refineries- are actually owned by different groups of sugarcane and oil palm growers.
- Until now the investment has been 100% national (around 3.800 millions of euros) .
- The technologies have been acquired from Europe for the biodiesel production and, from India, for the ethanol production.
- BLENDING MANDATES 2018 B10 E10 (B12 increasing in process).

MEMBERS

Biodiesel Producers

Ethanol Producers



FEDERACIÓN NACIONAL DE BIOCOMBUSTIBLES DE COLOMBIA



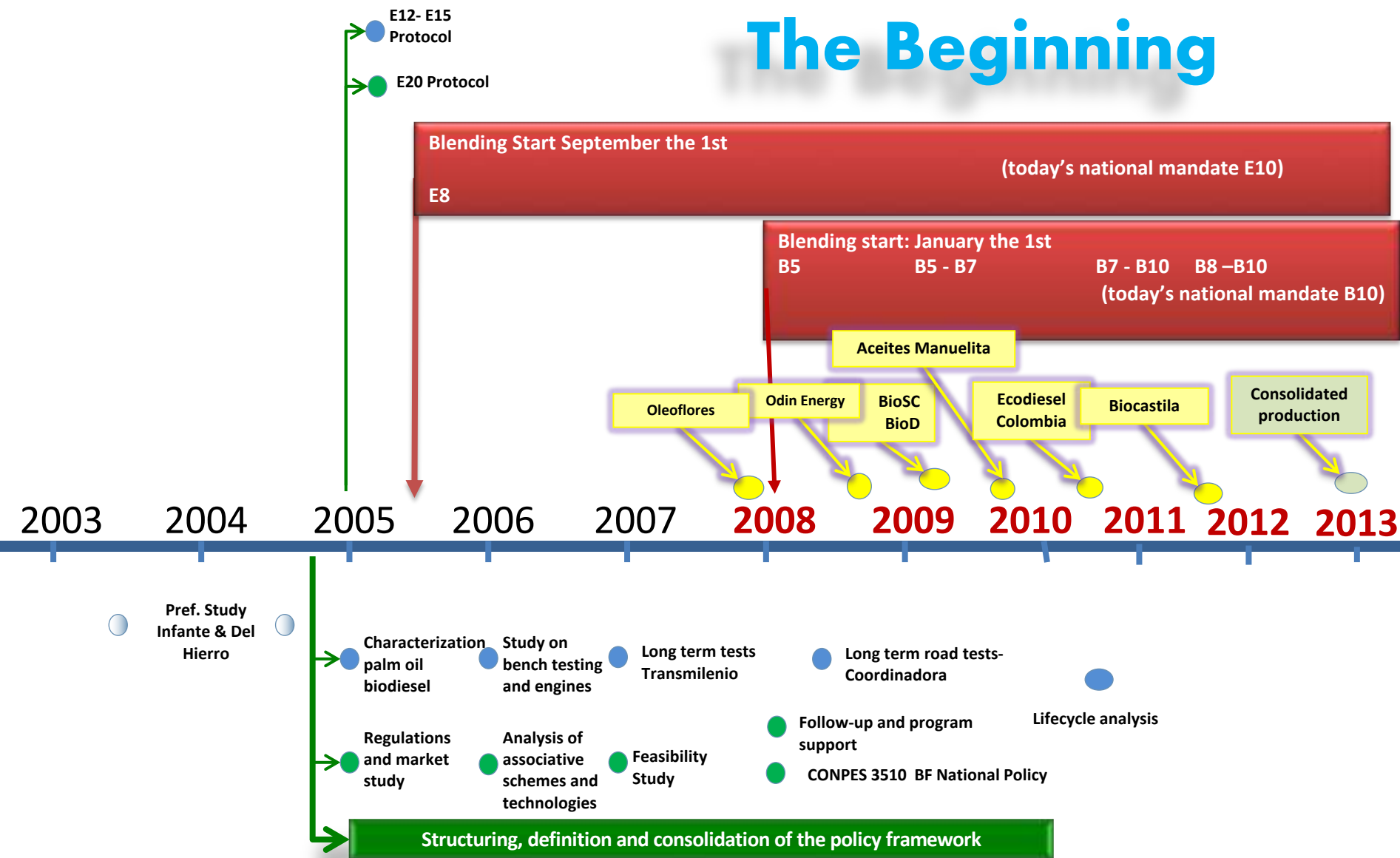
INTRO

1. The Biofuels Industry
 - a) The beginning
 - b) Today's challenges
 - c) The close future
2. The Markets
 1. Today's challenges
 2. The close future
3. The regulation
 1. Relevant Regulatory Framework
 2. Needs for the next years

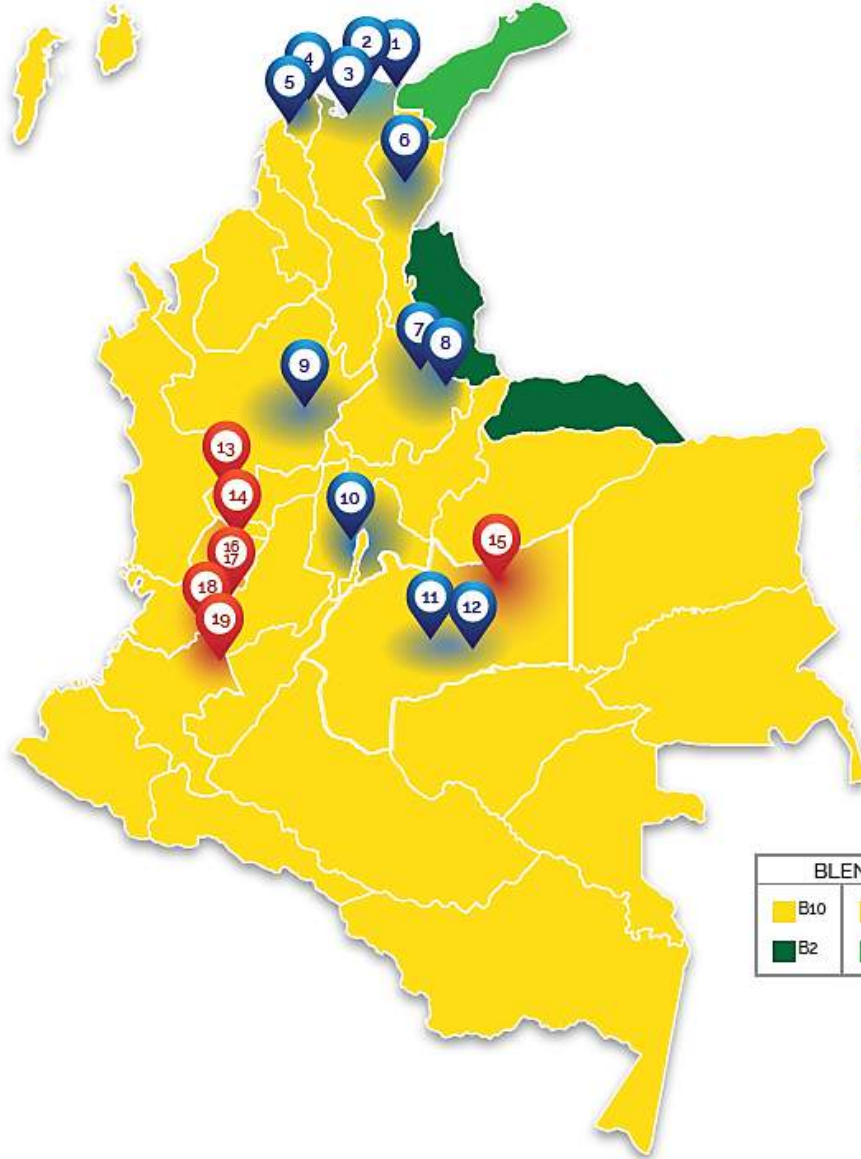
AGENDA



The Beginning



The Colombian Biofuels Industry



BIODIESEL PRODUCTION PLANTS		
1.	BIOSC	MAGDALENA
2.	ODIN ENERGY	MAGDALENA
3.	BGREEN	MAGDALENA
4.	ROMIL DE LA COSTA	ATLÁNTICO
5.	BIODIÉSEL DE LA COSTA	ATLÁNTICO
6.	OLEFLORES	CESAR
7.	ECODIESEL COLOMBIA	SANTANDER
8.	ALPO	SANTANDER
9.	BIODIÉSEL Y DERIVADOS	ANTIOQUIA
10.	BIO D	CUNDINAMARCA
11.	ACEITES MANUELITA	META
12.	INVERSIONES LA PAZ	META

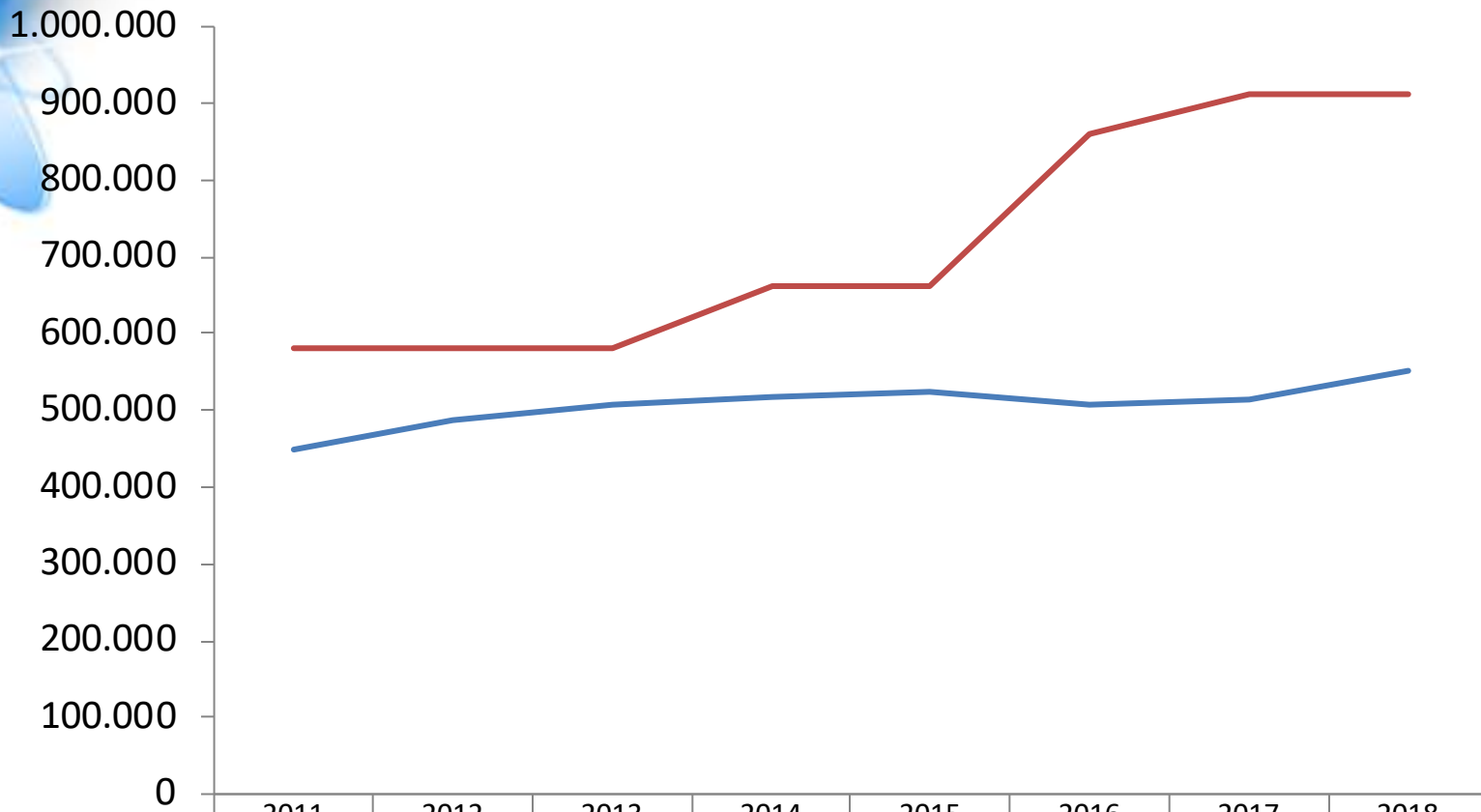


ETHANOL PRODUCTION PLANTS		
13.	INGENIO RISARALDA	RISARALDA
14.	INGENIO RIOPAILA CASTILLA	VALLE DEL CAUCA
15.	BIO ENERGY	META
16.	INGENIO PROVIDENCIA	VALLE DEL CAUCA
17.	MANUELITA	VALLE DEL CAUCA
18.	INGENIO MAYAGÜEZ	VALLE DEL CAUCA
19.	INCAUCA	CAUCA

BLENDS			
	B10		E10
	B2		E0

Biofuels in Colombia

BIODIESEL B10 TOTAL DEMAND



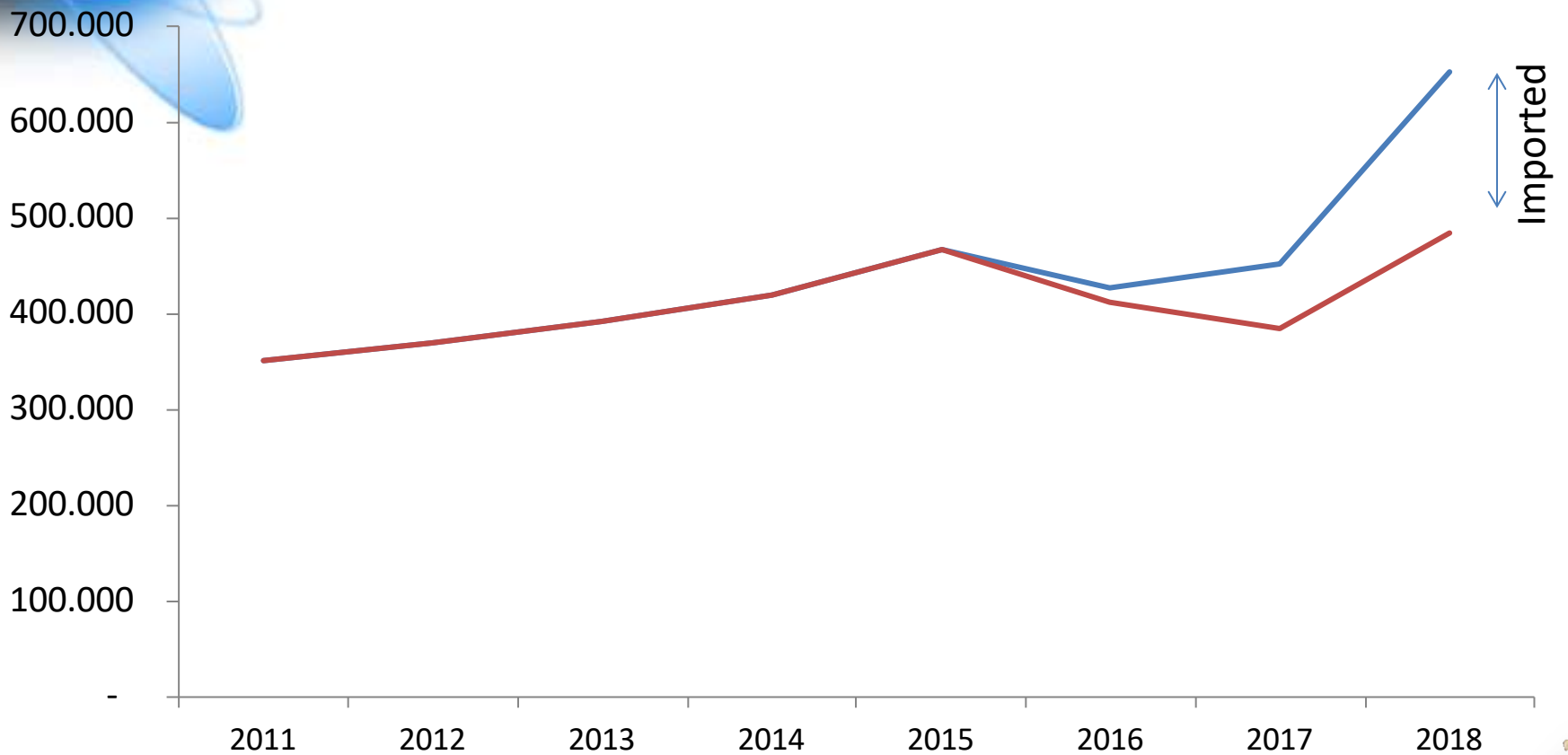
	2011	2012	2013	2014	2015	2016	2017	2018
— Capacidad Instalada	580.998	580.998	580.998	661.000	661.000	861.000	912.000	912.000
— Demanda Nacional de Biodiésel	448.934	488.191	505.896	518.745	523.403	506.990	513.297	551.629

Source: FNB



Biofuels In Colombia

BIOETANOL E10 TOTAL DEMAND



Source : FNB

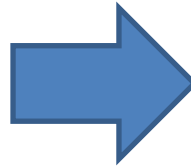


Today's Challenges

2004-2014

A few products

- POME
- SCBE
- Gliceryn

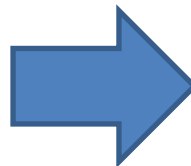


2015-2020

Products & byproducts basket

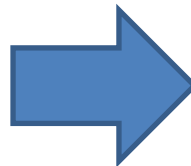
- Energy
- Biodiesel
- Bioethanol
- MES
- Glicerol + refined + USP
- Chain byproducts basket
- Etc.

**Transesterification plants &
Distilleries Building**



Biorefineries development

**Basic models of raw material
provision**



Clusters development

The Close Future

2004-2014

A few products

- POME
- SCBE
- Gliceryn



2015-2020

Products & byproducts basket

- Energy
- Biodiesel
- Bioethanol
- MES
- Glicerol + refined + USP
- Chain byproducts basket
- Etc.



2020-2030

Innovation + competitiveness in specilaized sector at global level:

- 2G Biofuels:
 - Nartional mandate B20+ voluntary higher blends in close fleets.
 - Waste & surBiomass .
- Other biofules (3G) and bioenergy production
- Power generation.

Transesterification plants & Distilleries Building



Biorefineries development



Value chain integrated production.

(Food, Feed, Cleaning supplies, Beauty & Cosmetic products. Oleo chemistry, alcochemistry etc)

Basic models of raw material provision



Clusters development



Region developent with visión & structure of Biobased Economy

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NEW MARKET FRAMEWORK

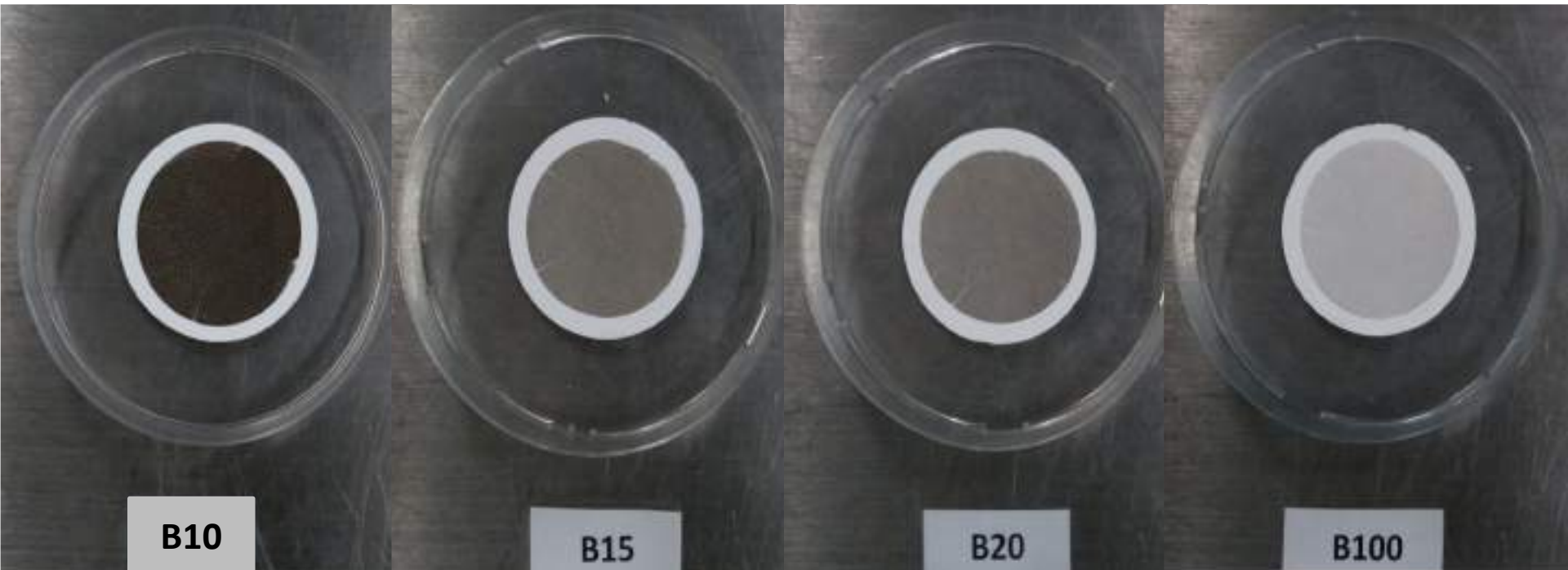
- Environmental Drivers
 - Climate Change: GHG Emissions
 - Public Health: PM Emissions
- Transport & Mobility Policies
 - New transport model for Big & Middle sized Cities
 - New urban development (smart cities)
 - Promotion of zero emissions vehicles
- New technologies for vehicles
 - Electric & hybrid mobility
 - High efficiency engines
 - Smart vehicles
- Changes on consumers profile
 - Share property – Vehicle rental by minutes/hours - Carpooling
 - Vehicle is no more an asset but a cost

EFFECTS: GREENHOUSE GASES REDUCTIONS

The use of biofuels (biodiesel 83% and bioethanol 74% of GHG savings), with mandatory blends of 10% in volume, reduces 3,3 million tons per year of CO₂.

Increasing blends (2019-2022) around 20% could reduce more than 6 million tons per year of CO₂.

EURO3 ENGINE FILTERS PARTICULATE MATTER



The Colombian Market

New Public Policy: Increasing mandatory blends: from 10% to 20% at 2022.

- Privates Challenges:
 - Increasing production
 - Increasing quality
 - Increasing efficiencies
 - Improve processes
 - New investments



Today's Exporting Goods From Colombia

- Palm methyl ester (POME)
- Crude Glycerin, Refined & USP
- Advanced Sugarcane ethanol



Biodiesel SPECs

PROPIEDAD	UNIDAD	REQUISITO	MÉTODO	RESULTADO
Densidad a 15 °C	kg/m ³	860-900	ASTM-D4052-16	875,4
Gravedad API a 60 °F	°API	Reportar	ASTM-D4052-16	30,0
<u>Humedad Karl Fischer</u>	mg/kg	250 máx.	ASTM-E203-16	167
Número ácido	mg KOH /g	0,50 máx.	ASTM-D664-17a Método B	0,28
Punto de fluidez	°C	Reportar	ASTM-D97-17b	12
<u>Monoglicéridos</u>	% en masa	0,40 máx.	ASTM-D6584-17	0,365
Diglicéridos	% en masa	0,10 máx.	ASTM-D6584-17	< 0,092
Triglicéridos	% en masa	0,08 máx.	ASTM-D6584-17	< 0,060
Glicerina libre	% en masa	0,02 máx.	ASTM-D6584-17	< 0,010
Glicerina total	% en masa	0,25 máx.	ASTM-D6584-17	0,124
Contenido de metanol	% en masa	0,2 máx.	EN-14110:2003 Método B	< 0,03
Contenido de FAME	% en masa	96,5 mín.	EN-14103:2003 (excluyendo numeral 10,2)	98,0
Viscosidad cinemática a 40 °C	mm ² /s	1,9-6,0	ASTM-D445-17a	4,492
Destilación	°C	360 máx.	ASTM-D86-17	345,7
Contaminación total ²	mg/kg	15 máx.	EN-12662:2008	< 6,0
Índice de yodo	g de yodo / 100 g	120 máx.	EN-14111:2003	53,8
Punto de nube	°C	Reportar	ASTM-D2500:2017a	12
<u>CSFT</u> ^{1 3}	s	360 máx.	ASTM-D7501-18 Modificado	93

Glycerin SPECs

PROPIEDAD	UNIDAD	REQUISITO	MÉTODO	RESULTADO
Apariencia	Visual	Reportar	Visual	Líquido viscoso de color ambar
<u>Contenido de glicerol (Assay)</u>	%	80% mín.	USP 35	83,15
Humedad Karl Fischer	%	15% máx.	ASTM E-203	10,97
pH	Unidades	Reportar	Método interno BioD S.A.	6,39
MONG	%	Reportar	ISO 2464	1,45
Cenizas	%	10% máx.	USP 35	4,42
Contenido de sales como NaCl	%	Reportar	Método interno BioD S.A.	4,40
Contenido de NaOH	mg/Kg	Reportar	Método interno BioD S.A.	No cuantificable
<u>Contenido de metanol</u>	%	0,1% máx.	ASTM-D7716-11a	<0,02

®

Advanced Sugarcane Ethanol Specs

Parameter	Units	Region/Country				
		Colombia	ASTM (USA)	Australia	Brazil	Europe
Bioethanol						
Appearance	visual	Clear and bright	Clear and bright	Clear and bright	Clear and bright	Clear and bright
% alcoholic at 20°C	% mass	99,2	92,1	-	99,3	98,7
Total acidity	mass %	0,007	0,005	0,005	0,005	0,007
pHe	pH	[7, 9]	[6.5, 9]	[6.5, 9]	-	[6.5, 9]
Ethanol content	vol %	99,5	92,1	95,6	99,6	98,7
Methanol content	vol %	0,5	0,5	1	-	1
Water content	vol %	0,5	1	0,4	-	0,2
Cu content	mg/kg	0,1	0,07	0,1	0,07	0,1
Inorganic chloride content	mg/kg	10	32	1,2	-	20
Colour		Colourless	Colourless	-	Colourless or yellow	Colourless
Density	kg/m3	791,5		800	791,5	

Colombian Main Export Markets

Destiny	Year		Variation	Participation (%)	Participation (%)
	2013	2017	(%)	2013	2017
United States	3.425	4.031	17,7	20,9	27
European Union	1.925	2.392	24,3	11,8	16
Ecuador	1.826	1.382	-24,3	11,2	9,2
Perú	1.075	911	-15,2	6,6	6,1
México	781	879	12,6	4,8	5,9
Brasil	984	677	-31,2	6	4,5
Chile	470	501	6,6	29	3,4
Japan	335	359	6,9	21	0,24
Panama	387	319	-17,6	24	2,1
Subtotal	7.358	11.451	-20,2	135,3	72,1

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4. Conclusions

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Colombian Relevant Regulatory Framework

Climate Change

- CONPES 3700
- Colombian strategy for developing low carbon
- National strategy, reducing emissions from deforestation
- National plan for adaptation to climate change
- 2018-2022 National Development Plan, chapter of "Green growth".
- National climate change policy PNCC
- Sectoral action plans PAS
- Decreto 298 of 2016 SISCLIMA

Biofuels

- Law 693 of 2001
- Law 939 of 2004
- CONPES 3510
- NTC6198 Alcohol Fuel
- NTC 5444, Biodiesel
- NTC 4231, 4983, 5365 Emissions.
- Decree 1073 of 2015
- Resolution 90963 2014 BD
- Resolution 0789 2016 AF
- Resolution 1962 2017 AF

Regulatory needs for the next future

- New Biofuels CONPES document
- Transition Policy & Regulation for new technologies.
- Control for market national and international asymmetries

But, it's needed to comply with international requirements of product and production (international standards as ISCC) and 3rd part certification as a key for markets access

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THANKS!

