

Biofuels in Mexico

ICAO Alternative Fuels Seminar

February 2017
Montreal, Canada

1. ASA´s role/responsibilities on aviation fuels
2. Biofuel experience in México
3. Results up to date
4. Challenges
5. Next steps
6. Technical development
7. New business opportunities
8. Additional key activities

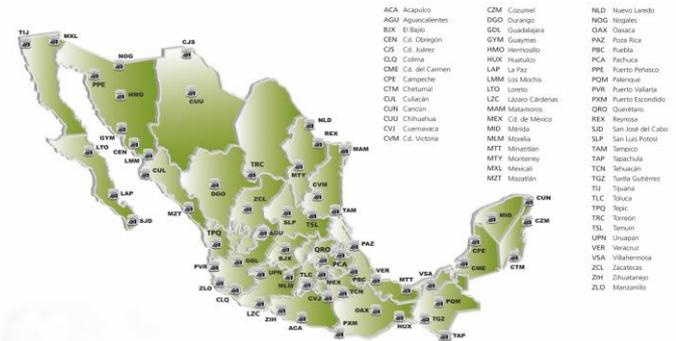
ASA is a Mexican Federal Government owned Organization, responsible for the managing and operation of:

18 owned airports and 5 as shareholder & Regional Training Centre Excellence

Aeropuertos de la Red ASA



Estaciones de combustibles

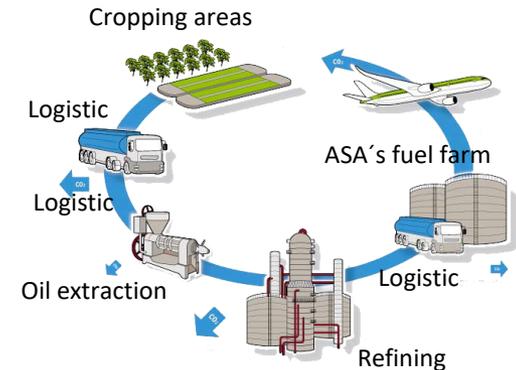


**60 Fuel farms nationwide ,
supply Jet Fuel and Avgas,
more than 50 years experience**

Since 2009 Mexico/ASA implemented a pilot plant: full value and process chain.

Results:

1. Active participation of stakeholders. (airlines, research centers, educational institutions and Entities of the Federal and State Governments).
2. Evaluate and measure the entire value chain in Mexico (selected seeds, extracted oil, refining, mixing with jet fuel, pricing).
3. To processes in blending/storage/into-plane services (México City Airport).
4. Promotion and implementation of 36 "green flights" (domestic and international): 110,000 liters supplied.



1. Mexican Government to develop a “Program for Sustainable and renewable fuels, including technology development”.

The logo for SAGARPA, featuring the word "SAGARPA" in a bold, serif font with a horizontal line underneath.SECRETARÍA DE AGRICULTURA
GANADERÍA, DESARROLLO RURAL,
PESCA Y ALIMENTACIÓN

2. Strategic plan, 4 main directives:

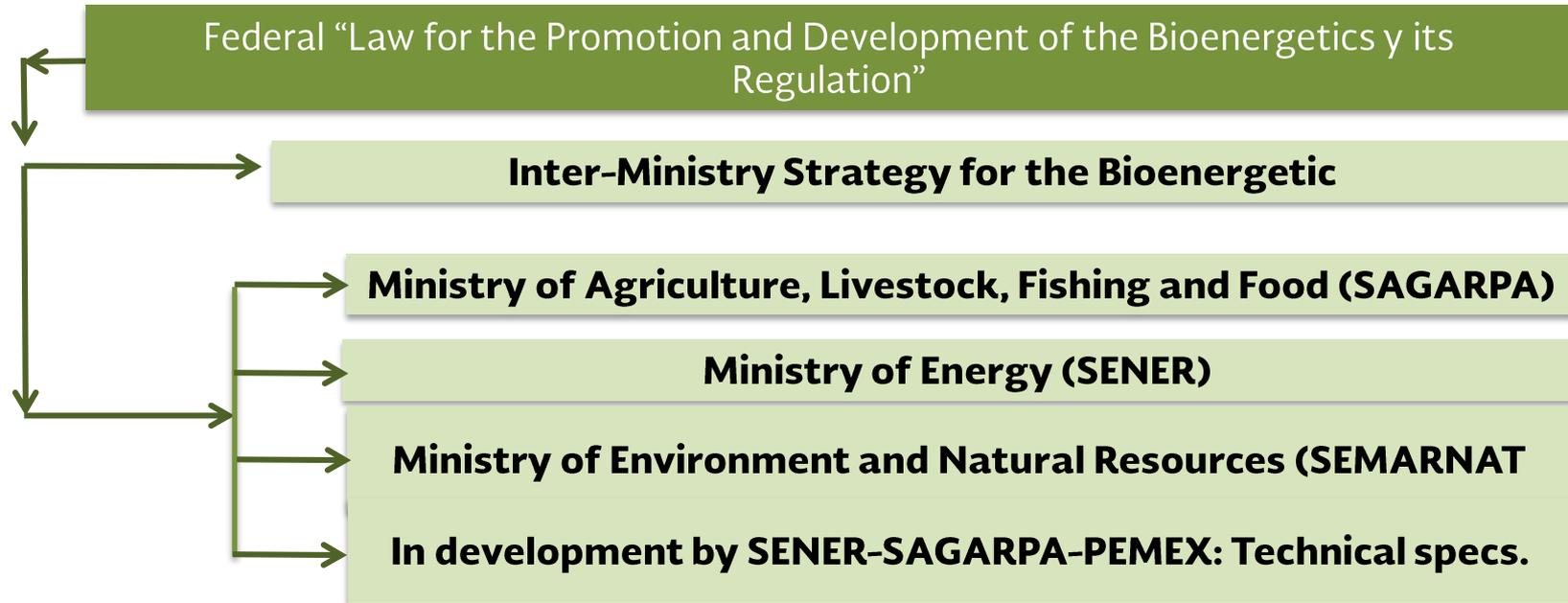
- Develop an information system for the stakeholders and public.
- Develop R & D and technology transfer.
- Promote and advise farmers associations.
- Implement production and commercialization of biomass in the mid and long term to provide certainty to investments.

3. Principles:

- Avoid cropping substitution on fields devoted to human consumption.
 - Evaluate hydric use, not to affect other available (existing) crops in the area.
-

Results up to date:

A) LEGAL FRAMEWORK:



The Law/Regulation and different activities developed by the Federal Government Ministries provided legal assurance for investors.

Results:

B) INFORMATION SYSTEM:

1. Biomass to be used in the Mexican Republic:

Jatropha



Higuerilla



Microalgae



Camelina



Used vegetable oil

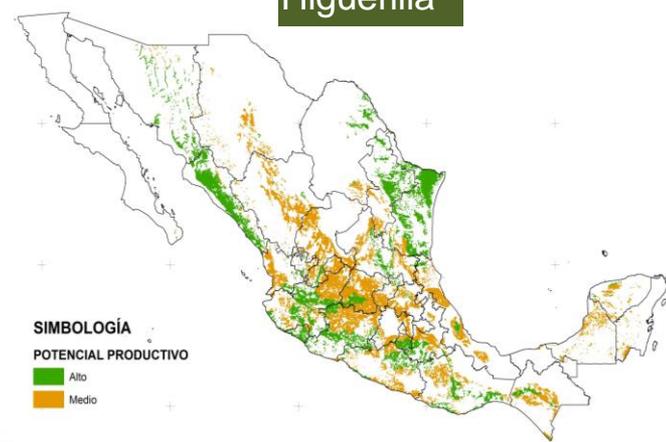


2. Mapping of crops:

Jatropha

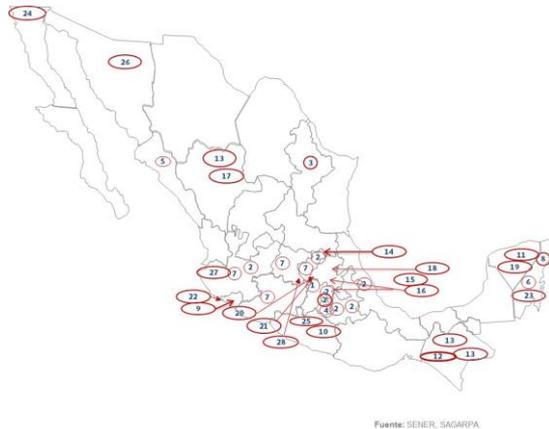


Higuerilla



B) INFORMATION SYSTEM:

3. Producers for Bio-diesel:



Producers supported by the Mexican Government:



C) R & D and Technology Transfer:

- Technology packages”: cropping, plague control, diseases, etc.
- Registration of 8 types of seeds.
- Development of 4 hybrid seeds.
- Dedicated machinery for cropping of Higerilla.
- By-products use: pasta, bio-oil.
- Yields tons/ha, etc.....

In order to cope with some restrictions, ASA needs:

Certainty on each step for the value chain

- Improve feedstock model (social development) & yields....
- Production model in large quantities (min-max)
- Supply contracts and profitability oriented/step

Environmental Schemes

- Application of CORSIA
- Domestic Regulation comparison/impact
- Sustainability programs with airlines

Fuel Price

- Price model for balancing value chain (step by step)
- Affordable price for industry (i.e. mix-%)
- Review potential incentives: environmental,

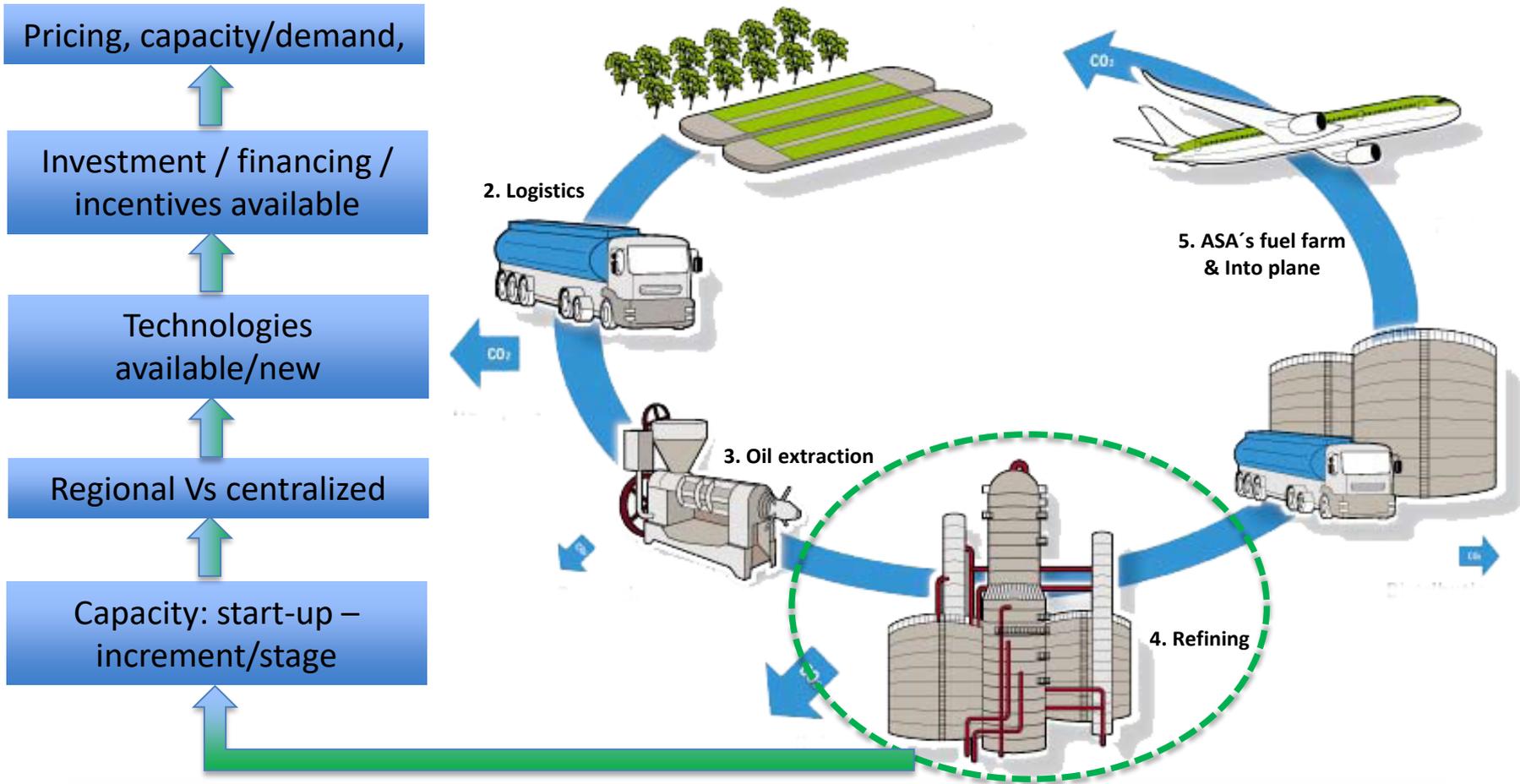
Supply model

- Standardized supply chain (step by step)
- Standardized logistic & distribution model
- Optimized supply model at airport, devoted tanking system

Long term investment & funding available

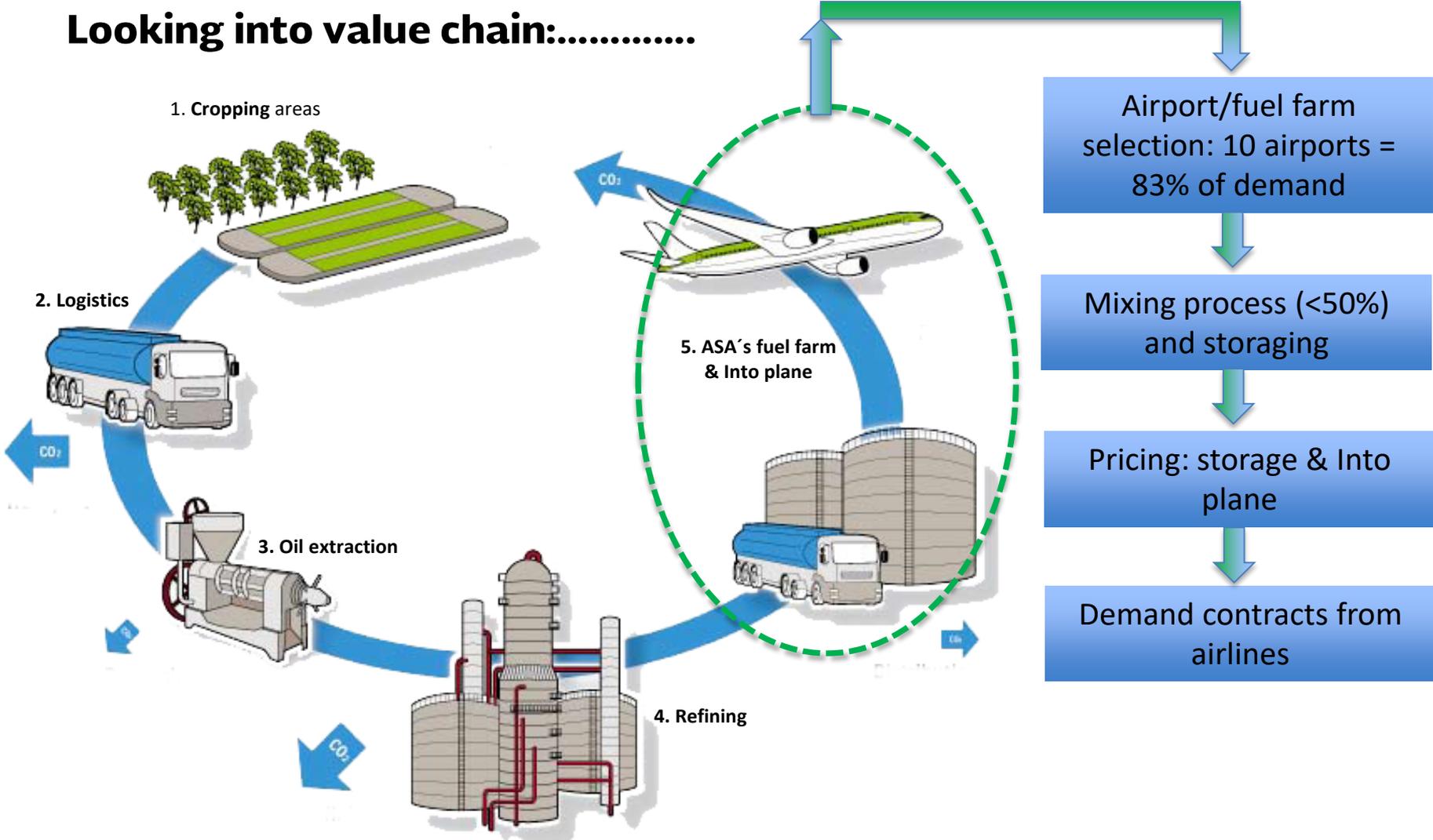
- Price model for balancing value chain
- Profitability for final product & payback period
- Risks and continuity of the supply chain

Looking into value chain:.....



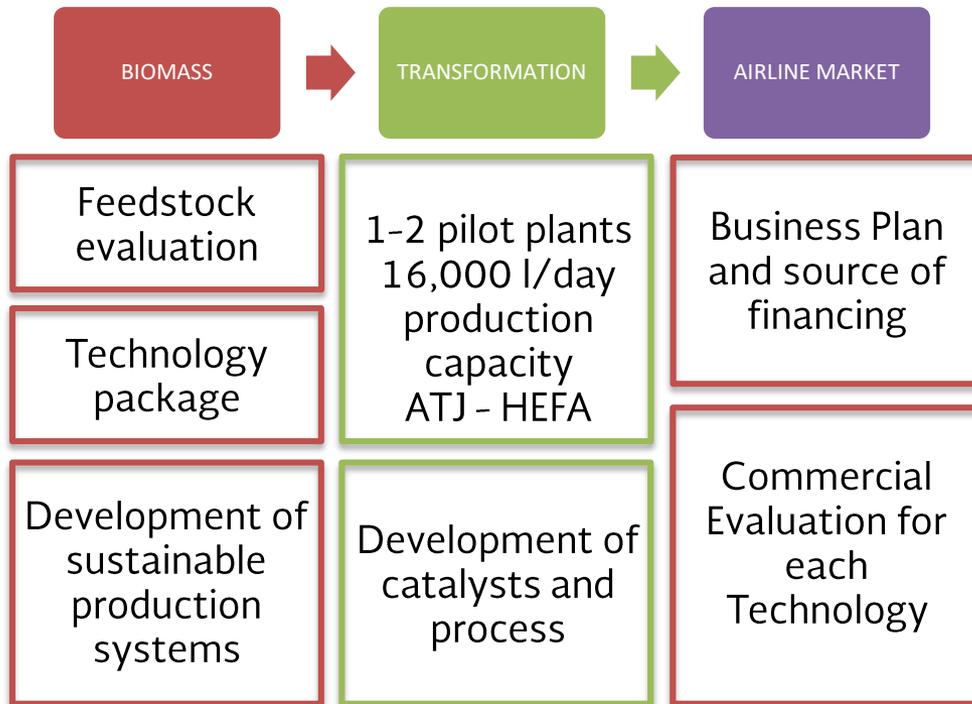
5. NEXT STEPS

Looking into value chain:.....



Joint effort: Mexican Federal Government and R&D organizations:

CEMIE BIO – BIOJET CLUSTER



- ✓ **Financed and Supported by the Government – Ministry of Energy and CONACYT (Sc. & Tech Agency) allocated USD17 million.**
- ✓ **Institutions allocated USD41 million**
- ✓ **R & D plan: 4 years.**
- ✓ **17 Institutions involved.**

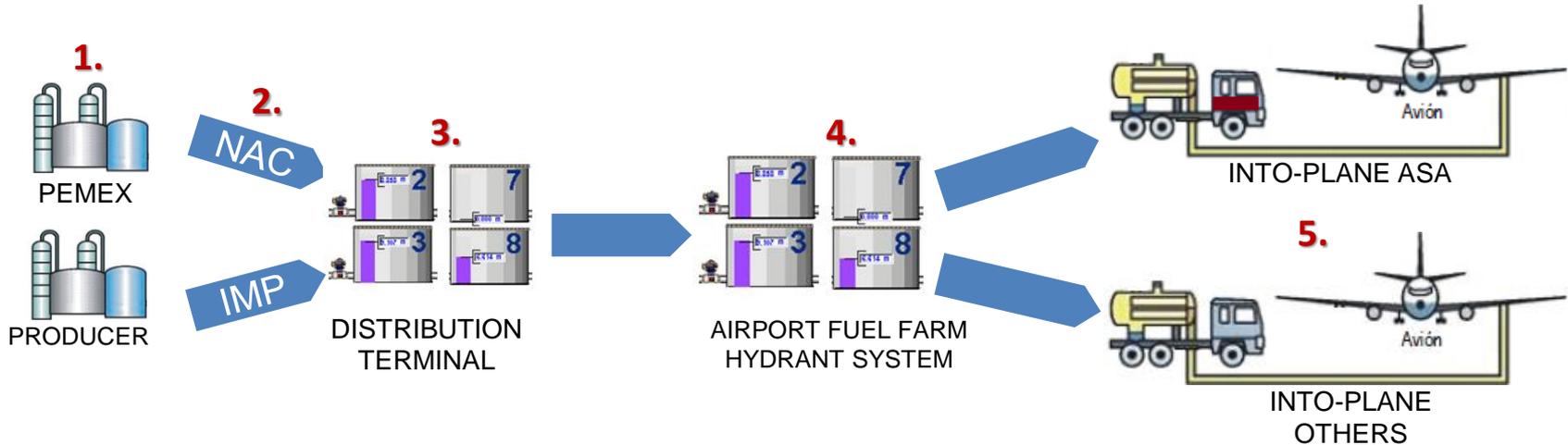
Private Companies
•Boeing Support

National Research Centers

Foreign Research Centers
•MASDAR
•JBEI

ASA

1. Energy Reform: new supply chain for jet fuel, open market.



IMPORTED BIOFUELS:

- ✓ New companies can import Biofuel (not only PEMEX) to Mexico/ASA.
- ✓ ASA can sign a contract to sell Biofuel to airlines.
- ✓ Depending on the logistics, ASA can assign storing capacity/airport.
- ✓ Capacity in F.F. to be allocated: 100 – 500 m³ in Mexico City, Cancún y Guadalajara airports, for Biofuel.

2. Investment opportunities:

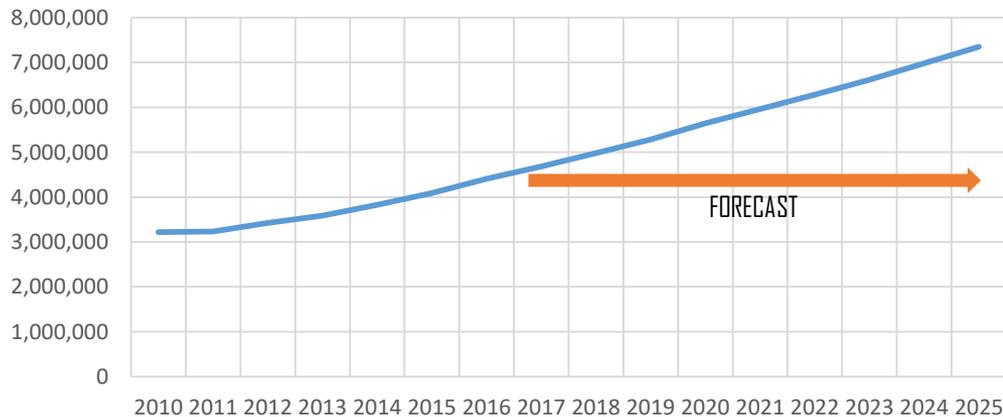
JOINT VENTURES:

- ✓ Private-public association (PPP's): with ASA as partner/purchaser.

3. Demand:

- ✓ ASA sold 4.4 billion liters in 2016 and growing.

JET FUEL DEMAND (M³)



**CONSISTENT GROWTH
OF THE JET FUEL MARKET
SINCE 2010**

- Develop the implementation plan for the ICAO CORSIA scheme with the Domestic Aviation Authority .
 - Continue with the promotion and development of "green flights".
 - Evaluate the impact of the use of biofuels in air operations.
 - Assess the impact of green diesel (HEFA +) for the Mexico operations
 - Review competitiveness of biofuels based on international practice (new alliances and technological developments).
 - Review experiences and support in other countries towards renewable aviation fuels.
 - Participate actively in international forums on the subject.
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SCT

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COMUNICACIONES
Y TRANSPORTES



Aeropuertos y
Servicios
Auxiliares



BIOFUELS IN MEXICO

HOPE TO SEE YOU
IN OCTOBER!!!

THANK YOU!!!