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PRIO Energy, S.A.

June 2015 – Oleofuels 2015

prioenergy.com



Agenda

- PRIO Energy, S.A.
- Portuguese Legal Perspective for Biodiesel
- Biodiesel Challenges
- Competitive Biodiesel Production



PRIO Energy, S.A.



History

2006 • CONSTITUTION OF PRIO





History

2007 • BIODIESEL PRODUCTION PLANT



PRIO's Biodiesel Plant

- Biodiesel production capacity of 113 000 ton/year
- Accessibility: sea, railroad, road.
- Raw materials: rapeseed oil, palm oil, soya oil, used cooking oils.



History

2008 • TANK FARM – S&H



LOGÍSTIC CENTER FEATURES

- Bulk Storage: 2010 - 76.000 m³;
- Licensed future expansion for 96.000 m³
- Secondary Supply: 4 Loading Bays
- Sea Port (Aveiro): Jetty equipped with loading; Loa 150 m, Draft 9 m
- Road (North, South, Spain): North and South: A1 and A17; A25 Spain
- Rail: Goods terminal, North railway connections



History

2008 • PRIO BRANDED NETWORK

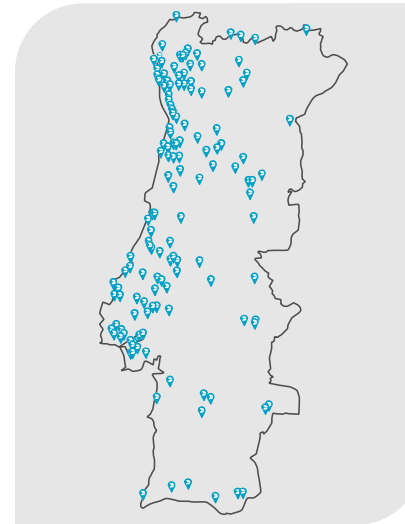




Prio's Petrol Station

Global Petrol Station Network

- 52 PRIO's "COCO" Petrol Station
- 47 PRIO's Express "CODO" Petrol Station
- 51 PRIO's "DODO" Petrol Station
- 16 PRIO's "DOCO" Petrol Station



166
Sites



COCO – Company Owned, Company Operated
CODO – Company Owned, Dealer Operated

DOCO – Dealer Owned, Company Operated
DODO – Dealer Owned, Dealer Operated



Portuguese Legal Perspective for Biodiesel



Biofuels Portuguese Legislation

- **Portuguese biofuels legislation until 2020** (DL n.º 117/2010, from 25/10)
 - a) Transposition of European Directive 2009/28/EC
 - b) Definition of the mandatory incorporation limits of biofuels, in transport, from 2011 to 2020 – **Limits in Energy**

2011 e 2012	— 5 %
2013 e 2014	— 5,5 %
2015 e 2016	— 7,5 %
2017 e 2018	— 9 %
2019 e 2020	— 10 %
 - c) Establishment of a **mandatory incorporation** for a minimum **6,75% (in volume)** of Biodiesel in transport diesel, from 2011 to 2014



Biofuels Portuguese Legislation

- **Sustainability**

- a) Since 2013 all biofuels used in Portugal for transport, must have a certification for sustainability
- b) All biofuels to be consider sustainable, must achieve a **GHG reduction of 35%**, compare to diesel GHG emissions

- **After 2014**

- c) Biodiesel mandatory incorporation is dropped
- d) Mandatory incorporation limits of biofuels, in transport, increase in **2% (from 5,5% to 7,5% in energy)**
- e) Mandatory incorporation of biofuels, in **gasoline** for transport, in energy **2,5%**



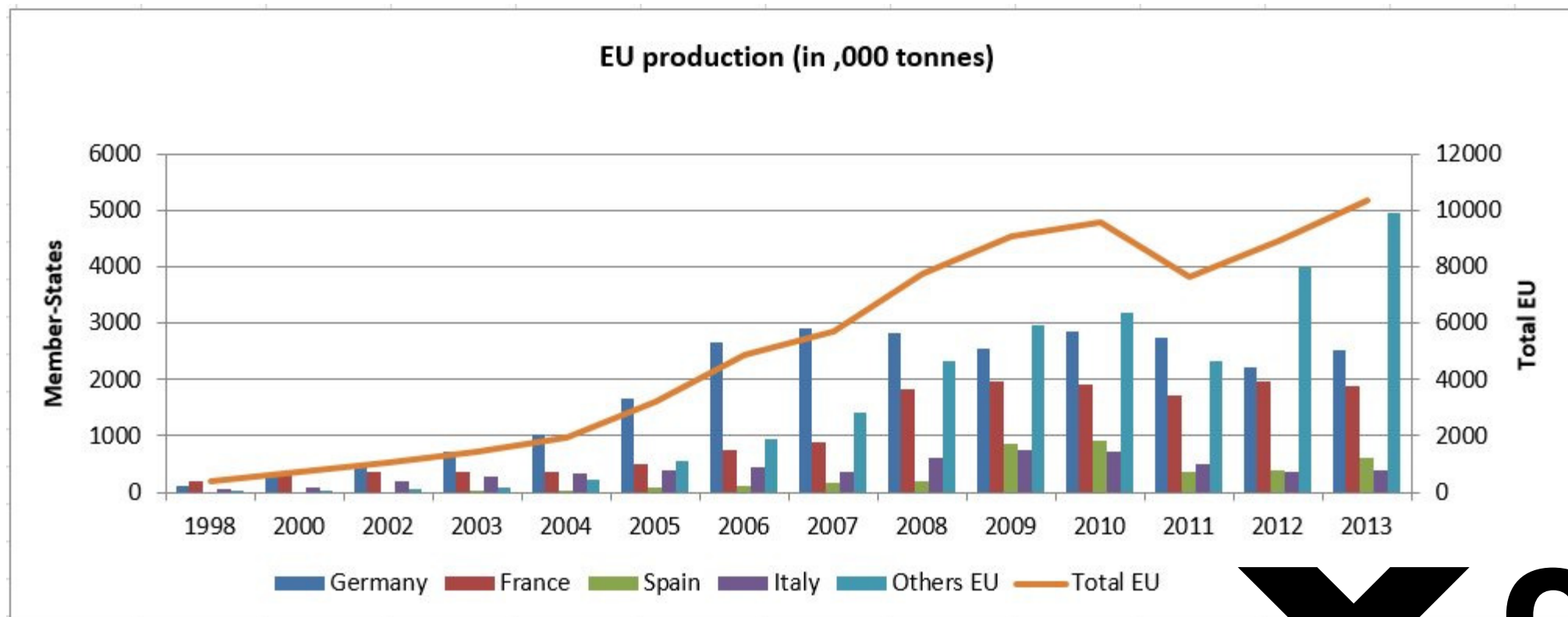
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Biodiesel challenges



Biodiesel Production Scenario

Europe Biodiesel Production



Since 2006

X 2



Biodiesel Production Scenario

Portuguese Biodiesel Production Capacity in 2014 was proximally 731 000 ton

Portuguese Biodiesel Incorporation in Diesel was, in 2014, proximally 305 000 ton

◀ **42%**

Europe has used less than **50%** of is Biodiesel Production Capacity in
2014



Biodiesel Sustainability

Biodiesel Production and GHG savings

	Typical GHG ¹ savings	Default GHG ² savings
Rape seed biodiesel	45%	38%
Soy bean biodiesel	40%	31%
Sun flower biodiesel	58%	51%
Palm oil biodiesel (Process not specified)	36%	19%
Palm oil biodiesel (process with methane capture at oil mill)	62%	56%
Corn ethanol, Community produced (natural gas as process fuel in CHP plant)	56%	49%
Sugar beet ethanol	61%	52%
Sugar cane ethanol	71%	71%
Waste vegetable or animal oil biodiesel	88%	83%

Source: European Commission, RED (Indirect land use is not included)

(1) Typical implies an estimate of the representative greenhouse gas emission saving for a particular biofuel production pathway.

(2) Default implies a value derived from a typical value by the application of pre-determined factors and that may, in circumstances specified in this Directive, be used in place of an actual value.



Biodiesel Challenges

- **European Producers Competitors** – South America, Indonesia and Malaysia
- **Biodiesel Production and GHG savings** – ILUC and GHG emissions from vegetable crops
- **Biodiesel Competitors** – HVO, algae and biofuels from biomass

Europeans wants for the future a biodiesel that is:

- **Cheap**
- **More environmental friendly**
- **Brings consensus to car and diesel manufactures**




Competitive Biodiesel Production



Competitive Biodiesel Production – Energy Consumption

Energy Consumption Reduction is a major factor for being competitive. Prio has embraced this objective by:

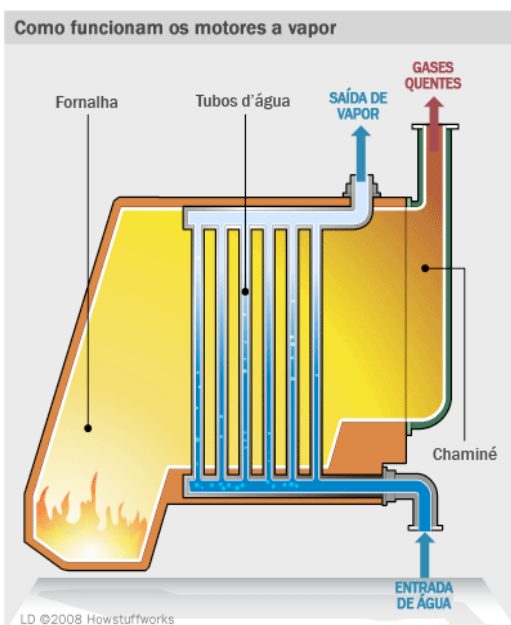
- 
- Optimizing the Thermal Flows (heating and cooling system)
 - Optimizing the Steam System
 - Reviewing the Electrical Equipment (pumps and illumination)
 - Reviewing the Compressed Air System



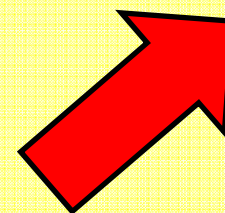
Competitive Biodiesel Production – Energy Consumption

Energy Consumption Reduction: GAS and ELECTRICITY

By optimizing Steam and Electricity
consumption...



Energy Price in
the last 5 years



21%


... Prio saved **12%** of total Energy Consumption, which represents savings of 100 K euros/year.



Competitive Biodiesel Production – Process Modelling

Process Modelling is crucial for an optimization of the Production Control System.

This represents savings in:

- 
- Methanol Consumption
 - Steam Consumption
 - Production Quality

COST SAVINGS


EFFICIENCY

QUALITY



Competitive Biodiesel Production – Modelling the Reaction

Modelling the Chemical Reaction and understanding the reaction kinetics for biodiesel production (transesterification) allows to:

- 
- Optimize Methanol Consumption
 - Optimize Catalyst Consumption
 - Optimize the use of different Oil Origins




Competitive Biodiesel Production

It's important to Save Cost by Saving Energy Consumption

But is mandatory to adapt to new challenges and the new challenge to 1st generation biodiesel plant is to produce biodiesel with higher GHG savings.

For that we need to:

- 
- Reduce Energy Consumption
 - Use GHG saving Raw Materials (Oils)



Competitive Biodiesel Production

UCO – Used Cooking Oils for Biodiesel Production

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- Non crop Raw Material for Biodiesel Production
- Minimum GHG savings of 83%



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