



Biofuels in the EU: a visión for 2030 and beyond

An Oil Company perspective

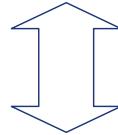
*Luis Cabra, Director Technology
Repsol YPF*

Brussels June 8, 2006

1. Contribution to the Vision Report

- Ambitious vision for 2030 and beyond
- Complete review of biofuels options, no pre-judgement on winners-loosers
- Most of the relevant technology challenges addressed

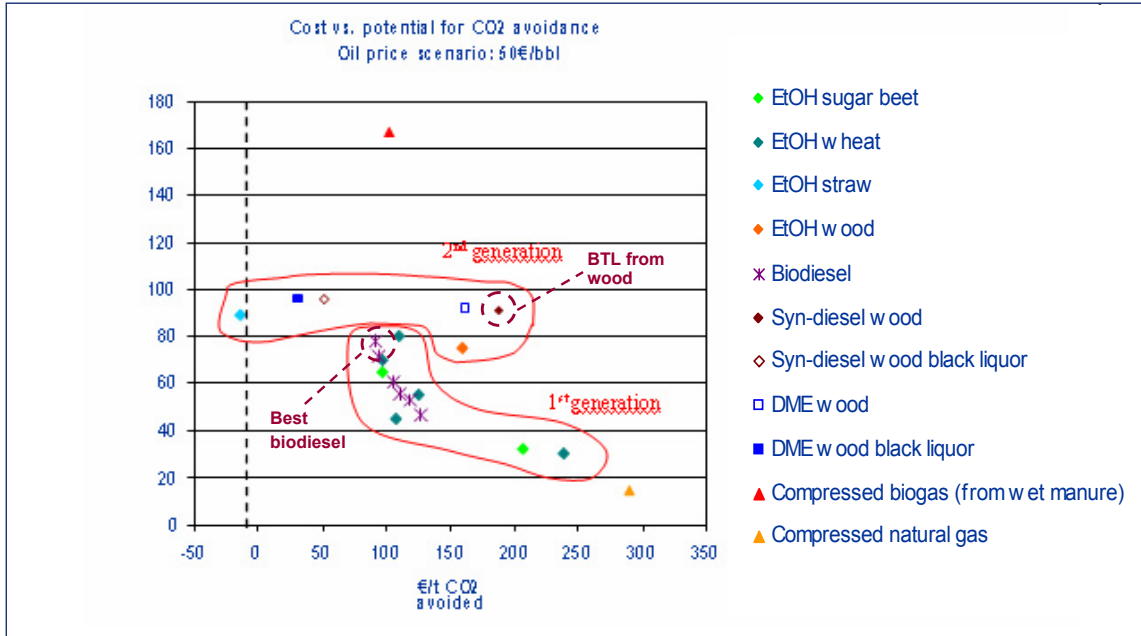
TECHNOLOGY



DRIVERS

- CO2 avoidance
- Diversification of energy sources and reducing dependence on Oil
- Need to reduce costs and widen raw material availability for biofuels

1st generation vs 2nd generation biofuels: a sound evolutionary vision that may turn into longer term co-existence?



So-called 2nd generation biofuels show better “average potential” but a number of 1st generation pathways look promising, also

- Biodiesel from lower quality-cost feedstocks (used oils, animal fats)
 - Feedstock characterization and quality control
 - Pre-treatment processes
 - Biofuel may be used for less stringent applications (e.g. stationary applications, asphalt)

- Oily material can be co-processed in existing oil refineries
 - Hydrotreating, thermal and catalytic cracking
 - Oils, fats, pyrolysis oil from biomass



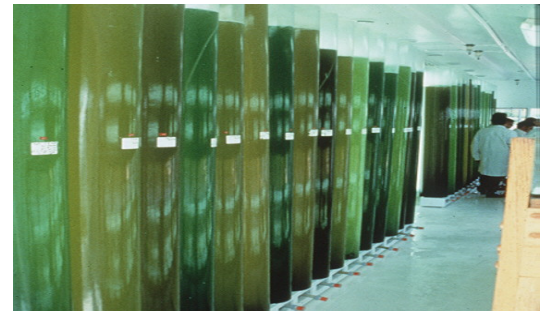


- From food crops to true energy crops
 - Higher yield
 - Better adapted to local conditions within EU (and outside)
 - Improved culture rotation

- Radically novel approaches
 - e.g. marine crops



Experimental rapeseed field in León (Spain)



Experimental photobioreactors for algae growth

The European Biofuels Technology Platform needs a strong presence of the “Upstream Sector”

- Member States

- EU-accession countries

- US of America

- Developing regions with biofuel potential
 - Latin America

 - Asia

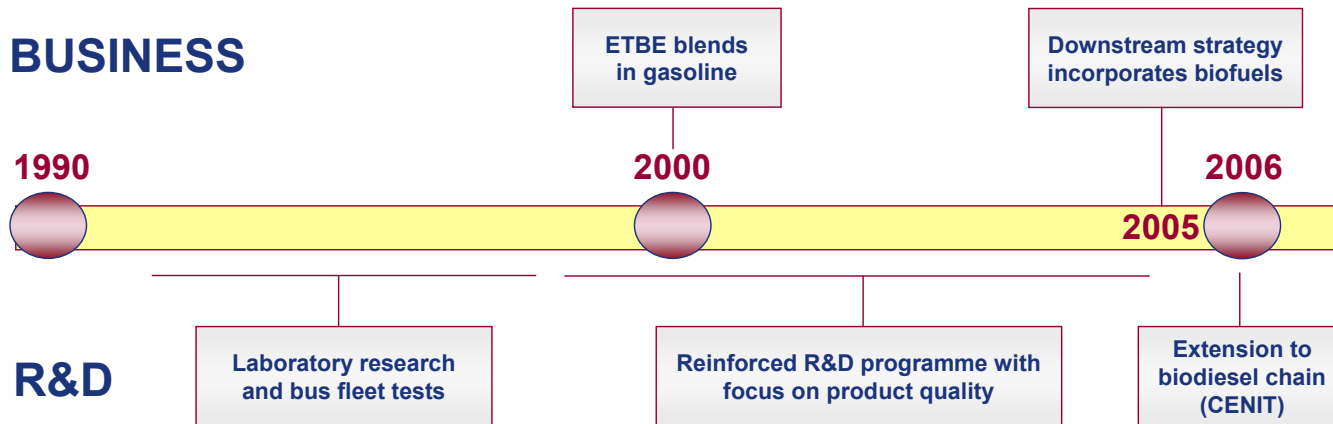


Soy field in Santa Fe province, Argentina

2. Repsol YPF: positioning and R&D

- Repsol YPF presence in biofuels markets started in 2000 by blending of bioethanol-derivative ETBE with gasoline (n° 1 blender of bioethanol in EU with 150,000 ton/year)
- In 2005, a Downstream strategy is announced dealing with the growing demand of clean motor fuels (diesel oil mainly), including investments in Spanish refineries and diversification of energy sources through **biodiesel**. Biodiesel will be produced in a sufficient amount to reach the Biofuels Directive 2010 target for our sales (more than 40% market share)
- Further plans on biodiesel are underway in Argentina, which would proceed as far as sound support legislation is approved
- Business development is supported by an intensive RTD&D programme

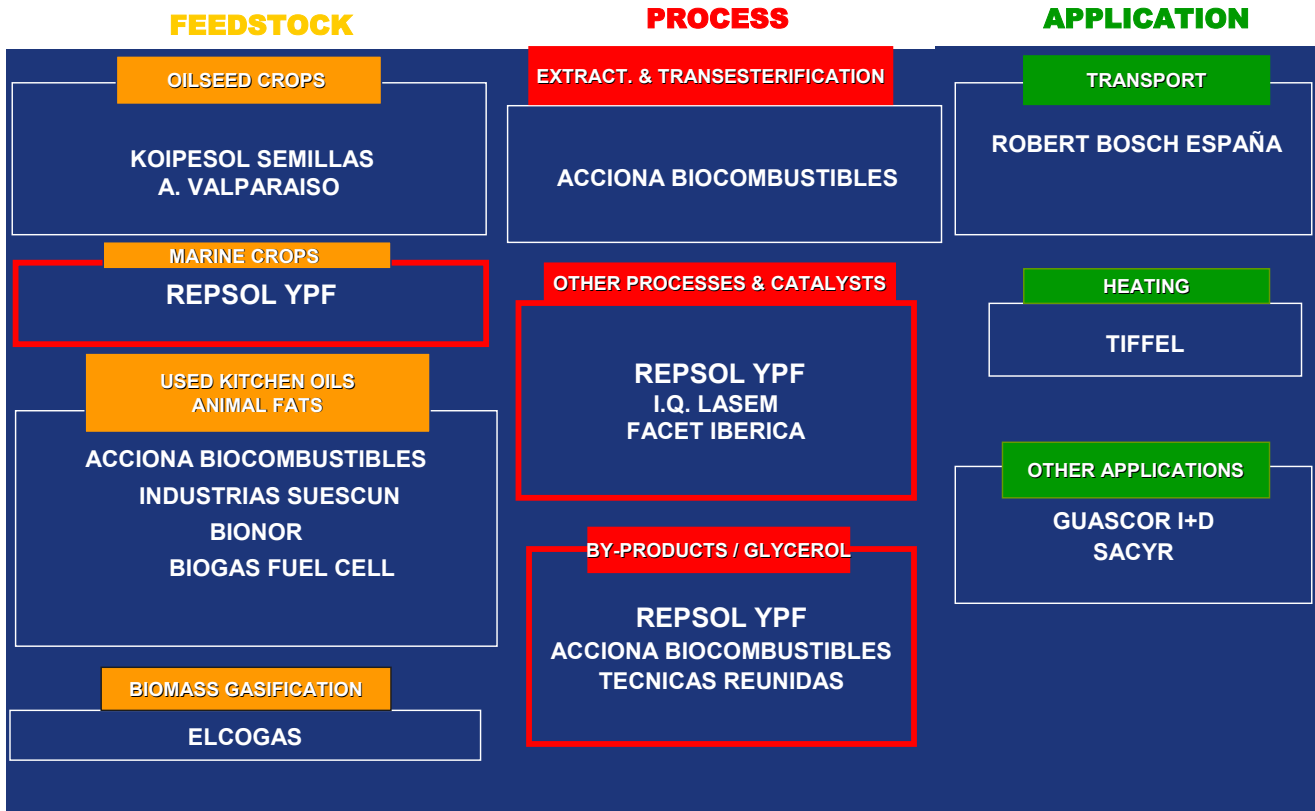
- The World biggest company agreement on biodiesel signed to date
- Business development along all the value chain from production to commercialization of 1,000,000 ton/year biodiesel before 2010: 6 plants (5 near refinery sites plus one in León as a reference integrated project), capex 300 million €, operation 2007-2009
- Further figures: 200 direct jobs plus 5.000 indirect jobs, 200 to 300 thousand ha of irrigated land already identified as suitable for rapeseed or sunflower plantation, reduction of 1,8 million ton/year of CO2 emissions
- A decisive step towards compliance with the European Biofuels Directive and Spanish “Plan Nacional de Energías Renovables” 2010 targets, which calls for a total of 2.2 million toe/y of biodiesel



- ✓ 15 companies, 23 contracted R&D centres, 23 million € 2006-2009
- ✓ Co-financed by public funds under the CENIT programme
- ✓ Development of knowledge and technology along the biodiesel chain (*) to:
 - Reduce manufacturing costs
 - Extend availability and range of local raw materials

(*) Biodiesel: product from vegetable or animal origin that can be used as automotive gasoil and other gasoil uses







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