

**BIOFUELS : POTENTIAL FOR GROWTH**

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**SUMMARY**

- TOTALFINAELF : Picture of the Group
- BIOFUELS : Some definitions and why ?
- TOTALFINAELF : A biofuels wide experience
- BIOFUELS : The reasons of the choices
- BIOFUELS : The different situations in the world, the demand, the answer.
- BIOFUELS : The potential for farming activity
- AS CONCLUSION

## BIOFUELS : Potential for Growth

### TOTALFINAELF : Picture of the Group

- The 5th largest oil company in the world  
(Supplier of sulphur to the fertilizer producers)
- The 5th largest chemical company in the world  
with a fertiliser activity : AZF - Grande-Paroisse S.A.
- Operating in more than 100 countries
- Workforce : 123 000

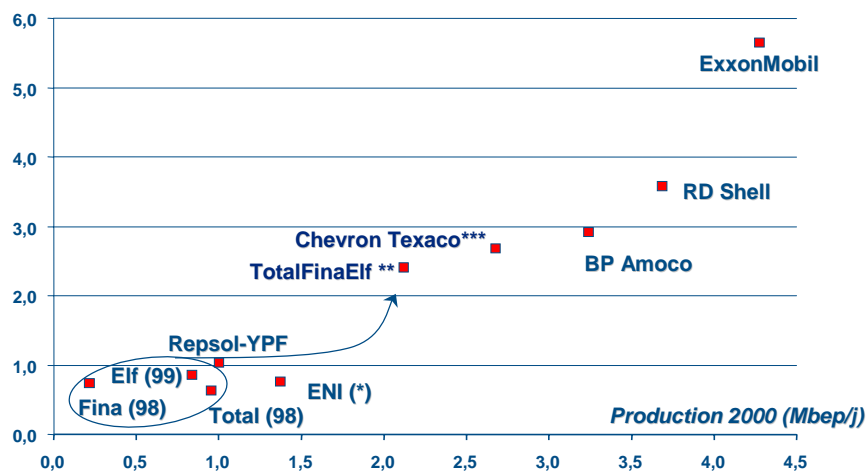
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## BIOFUELS : Potentials for Growth

Refined products 2000 (Mb/d)



\* ENI: estimation incl. Lasmio  
 \*\* TotalFinaElf: Incl. CEPSA 45.6%  
 \*\*\* Chevron Texaco : Proforma

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## BIOFUELS : Potential for Growth

### TOTALFINAELF : Picture of the Group

#### ↳ Exploration - Production (UPSTREAM)

- Reserves well balanced across major oil basins
- 70% of reserves concentrated in 7 countries.

#### ↳ Refining and Marketing (DOWNSTREAM)

- Refineries 27 (15 directly-run)
- Network 17 700 service-stations
- European and African leader

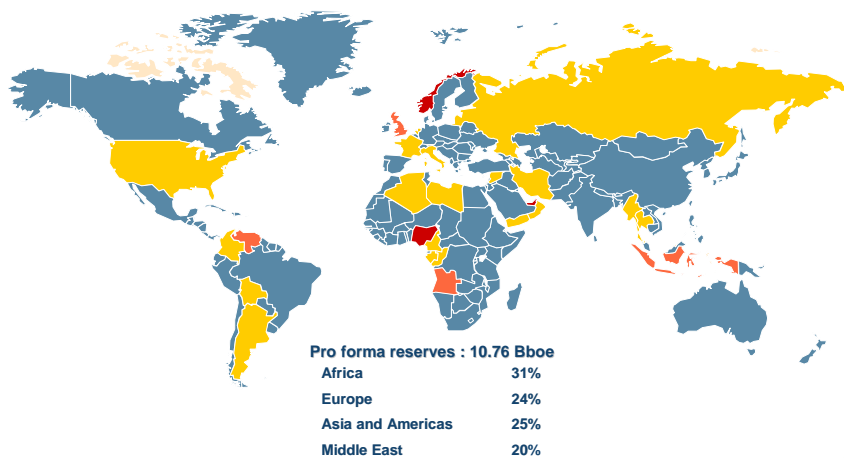
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## BIOFUELS : Potential for Growth

### E - P : Balanced reserves



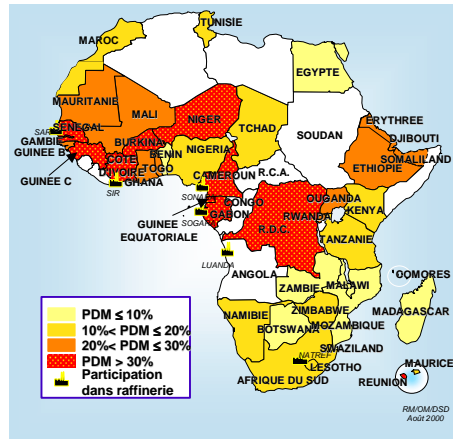
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## BIOFUELS : Potential for Growth

### R and M : A leading presence in African market



A strong marketing presence in more than 40 countries

20% Retail Market Share (on international companies)

3,350 service stations

Interests in 6 refineries with technical assistance

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## BIOFUELS : Potential for Growth

### BIOFUELS : Some definitions

- ↳ BIOENERGY, BIOFUELS : made mainly from biomass (the biodegradable fraction of products from agriculture, forestry or of wastes from related industries).
- ↳ BIOFUELS : To make working a combustion engine (≠ of fuels for heating or ... wood for cooking) → Road fuels.
- ↳ BIOFUELS : Used pure or in blend with fossile fuels.

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## BIOFUELS : Potential for Growth

### BIOFUELS : Some definitions

#### ↳ BIOFUELS : Two sectors

- From vegetables oils → esterification → biodiesel → diesel fuel

Use of pure or blended vegetable oils in current motors impossible due to their physical and chemical characteristics.

- From vegetable with sugar }  
or } → ethanol } gasoline  
starch } → + isobutylene → ETBE\* }

\* Ethyl Tertio Butyl Ether

## BIOFUELS : Potential for Growth

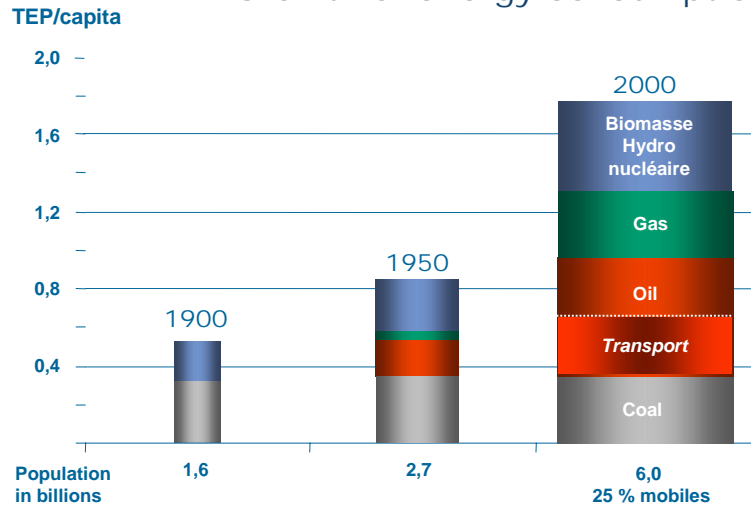
### BIOFUELS : Why ?

#### ↳ An explosive growth of energy

1900 → 2000

## BIOFUELS : Potential for Growth

### Growth of energy consumption



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## BIOFUELS : Potential for Growth

### BIOFUELS : Why ?

↪ An explosive growth of energy

1900 → 2000

↪ Road Fuels : A very different situation by the world

→ What level of road fuels consumption for the futur ?

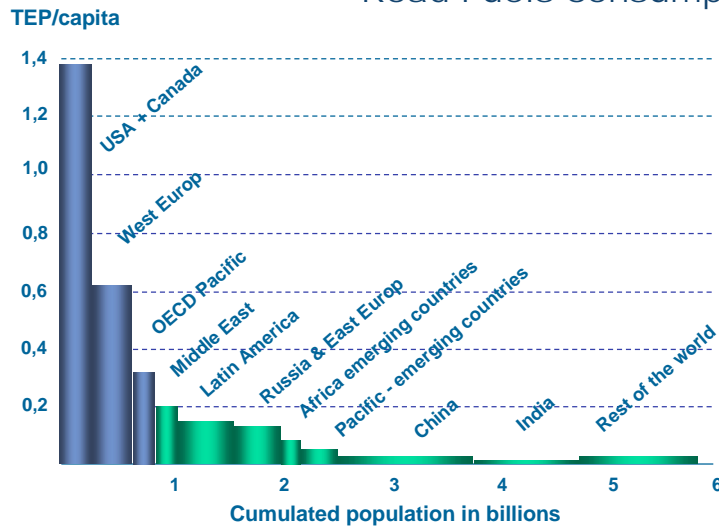
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## BIOFUELS : Potential for Growth

### Road Fuels consumption



Source IEA + IIASA  
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## BIOFUELS : Potential for Growth

### BIOFUELS : Why ?

- ↪ An explosive growth of energy  
1900 → 2000
- ↪ Road Fuels : A very different situation by the world
  - What level of road fuels consumption for the futur ?
- ↪ If wide reserves of crude oil, no change of the estimated ultimate level
  - What will be the alternatives sources of energy ...  
Biofuels ?
- A renewable energy → Better for GHG reduction

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TOTAL FNA ELF

## BIOFUELS : Potential for Growth

### World ultimate reserves



No augmentation in the estimation of the ultimate reserves

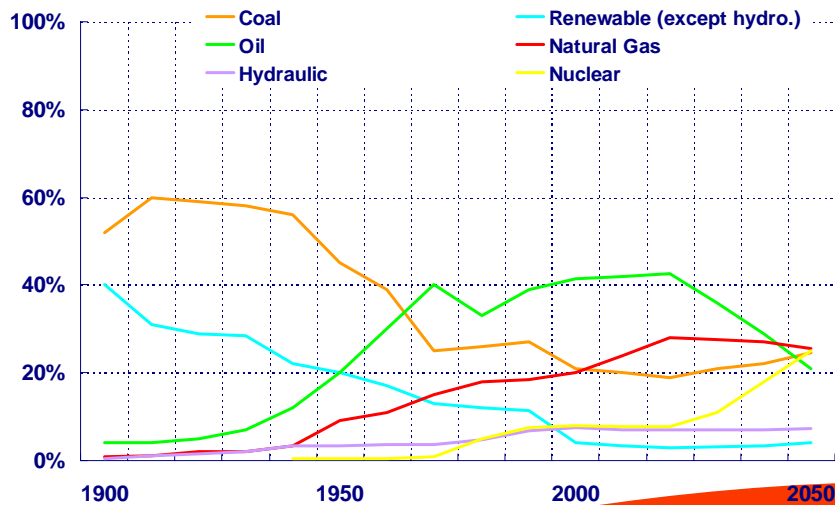
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## BIOFUELS : Potential for Growth

### Previsionnal share of the different sources of energy



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## BIOFUELS : Potential for Growth

TOTALFINAELF : A biofuels wide experience  
and an engagement in renewable energies

- ↪ Ethanol in USA since 1982
- ↪ ETBE in France since 1993
- ↪ Biodiesel in France since 1993

Now developments in Spain (ETBE, Biodiesel), Italy (Biodiesel),  
United Kingdom (Biodiesel, ETBE), Germany (Biodiesel),...

Also alternatives energies : Photovoltaic systems and wind  
electricity

## BIOFUELS : Potential for Growth

Biofuels : The reasons of the choices

### ↪ Technically

Products able to be blended with the usual gasolines	} No extra cost and technically
Transported in the existing oil logistic	} « transparent » for our
Used in the vehicles without modifications	} customer

### ↪ Commercially

The warranty of the car or truck manufacturers	} Satisfaction of
A good drivability for our customers	} our customer

### ↪ Economically

Equivalence for the oil company	} Obligation of
(references to the international market of the	} subsidies or
petroleum products).	} tax exemption
Interest for all the stakeholders	

## BIOFUELS : Potential for Growth

### Biofuels : The different situations in the world, the demand

↳ What is the need of the market ?

Gasoline or Diesel fuel  
Example of the European evolution

↳ What is the level of the car or truck manufacturers requests or the technological level of the national vehicles park?

↳ What are the obligations from the environmental regulation : tail-pipe emissions, fuels specification, etc ?

The most severe specifications : European Union in 2005

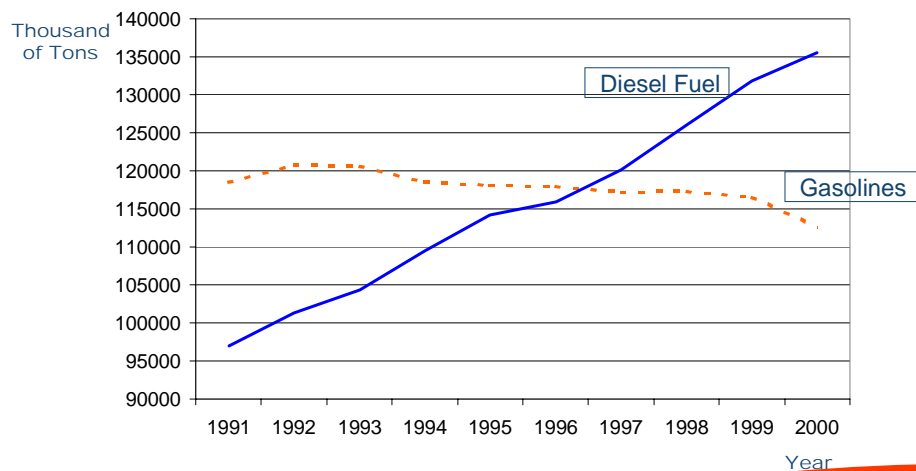
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## BIOFUELS : Potential for Growth

### The evolution of the road fuels in European Union



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## BIOFUELS : Potential for Growth

Biofuels : The different situations in the world,  
the answer

- ↪ Mainly Gasoline market countries with medium level car park : → ethanol
  - Blended with gasoline : gasohol
  - Brazil (12 Mm<sup>3</sup>), USA (6 Mm<sup>3</sup>), India from sugar cane (excess of sugar)
  - China (excess of cereals)
  - Australia, Far East, Mexico, Thailand, Ukraina,...
  
- ↪ Gasoline market countries with strong requests of the car manufacturers : → ETBE from ethanol
  - Blended in refineries in gasoline : France, Spain, Polska,...
  - (Cereal, Sugar Beets,...)

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## BIOFUELS : Potential for Growth

Biofuels : The different situations in the world,  
the answer

- ↪ Mainly diesel fuel market countries : → Vegetable Oil Methyl Ester (Fatty Acid Methyl Ester ?)
  - Pure product : Germany (400 000 m<sup>3</sup>), Austria (Rapeseed)
  
  - Blended with diesel fuel (a strong request of the car manufacturers) :
    - France (500 000 m<sup>3</sup>) (Rapeseed, sunflower)
    - Italy (300 000 m<sup>3</sup>) (Rapeseed, sunflower)
    - United Kingdom, Spain, (Rapeseed, sunflower)
    - USA, Brazil,... (Soya ?)
    - Indonesia, Malaysia,... (Palm oil?)

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## BIOFUELS : Potential for Growth

### Biofuels : The Potential

- ↪ Now, as renewable energy:
  - Possibility of GHG reduction
  - Also to reduce the fossil fuels importations, but with fiscal or other incentives to reduce the overcost in front of the fossil energy cost (~ 3 for 1)
- ↪ Later, but when ?...
  - As a necessary contribution, for the supply of the energy, so with a less overcost.
- ↪ But what will be the raw materials ?
  - Cereals, sugar cane, sugar beets or ligno-cellulose from wood...
  - Cultivated oil or something else after research...

## BIOFUELS : Potential for Growth

### For farming, what potential ?

- Mainly, the energy crops from productions in excess
- The researches to find raw materials at the lowest cost (biomass residues as forestry residues,...)
- No significantly more surfaces to cultivate, but less reduction of these surfaces instead of more set-aside (follow)
- A political decision to give the economical viability for biofuels : several possibilities to reduce the GHG emissions and for the biofuel opponents, the more expensive way. But that activity gives also others fiscal revenues to the states.

## BIOFUELS : Potential for Growth

### As conclusion

- Almost impossible to calculate the fertilizer consumption due to biofuels :
  - Political decision only
- No special farming :
  - The usual fertilizers consumption for each crop
- The future with special energy crops ?
  - If the energy demand increases, what about the food demand ?
- If fiscal incentives or equivalent, the biofuel development will be related to the demand of each market area. The obligation of use (in discussion in some countries) is the worst way for a development on solid basis.
  - But now there will be a part of biofuels for ever in the road fuels, but perhaps not with the present raw materials.