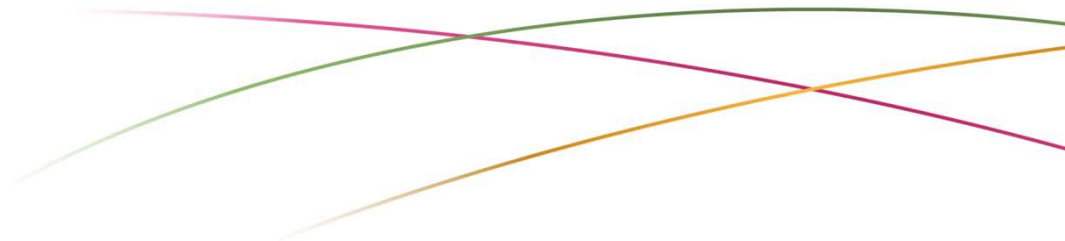




# A Long term view for Ethanol 1st & 2<sup>nd</sup> Generation

2009



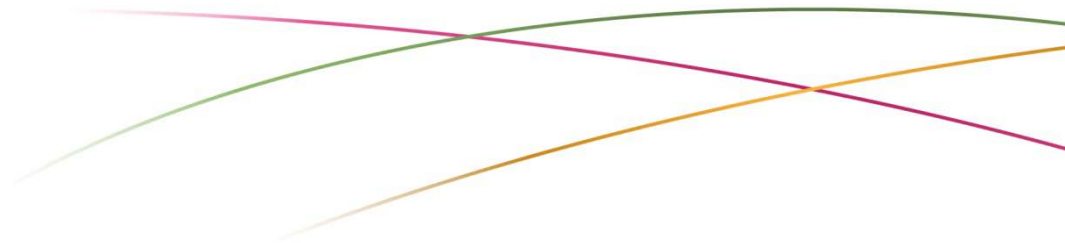
# Summary

- **TEREOS : Farming Shareholders**
- **Ethanol : Partial substitution to Petrol. (not superseding)**
- **5 Prices Ratios to look at.**
- **Conclusion : Ethanol development is sustainable.**



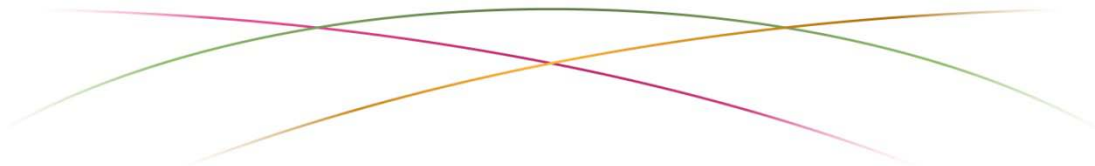


# TEREOS : Farming Shareholders





# Farming shareholders 12,000 cooperative growers



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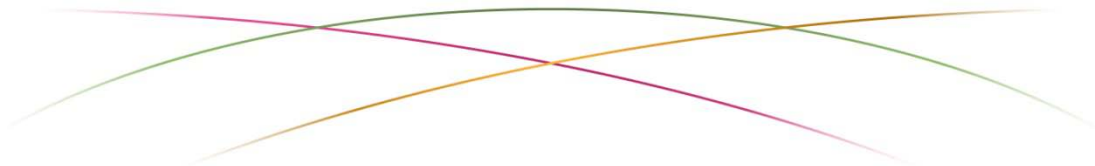
# Sugars

- Saccharose
- Starch and derivatives



# Alcohols

- Traditional markets
- Bioéthanol



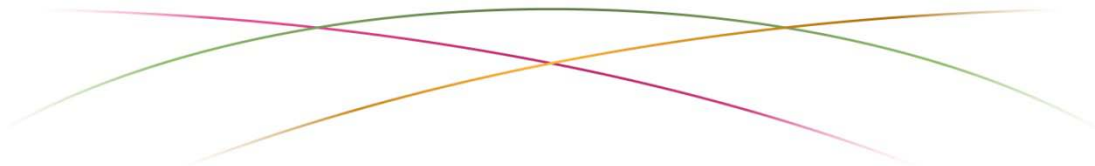
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# Sugar Beet



# Cereals

# Sugar Cane



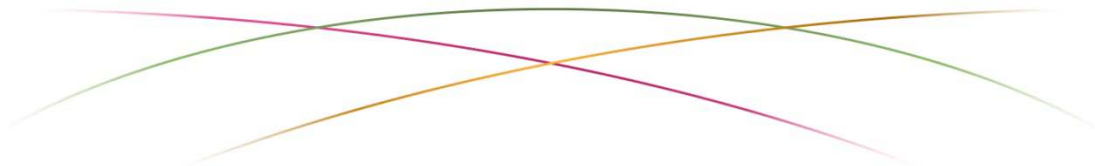
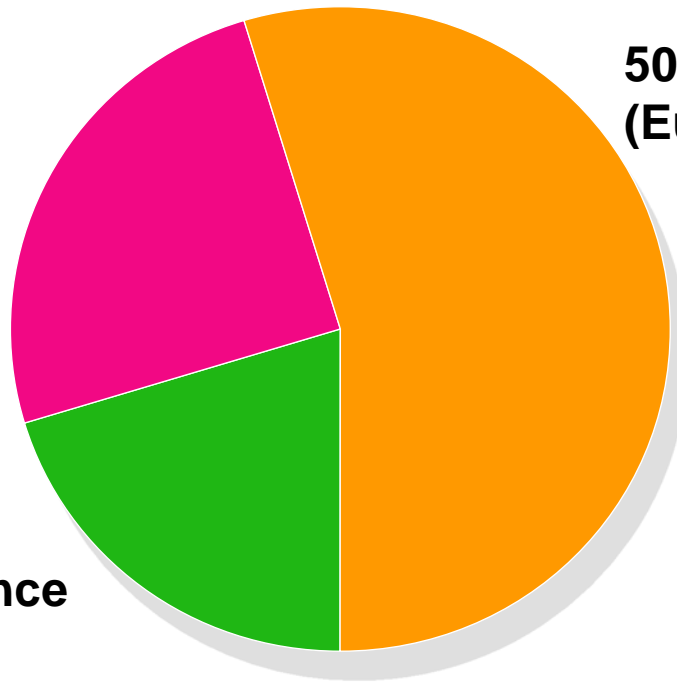
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# 920 000 hectares farmland involved

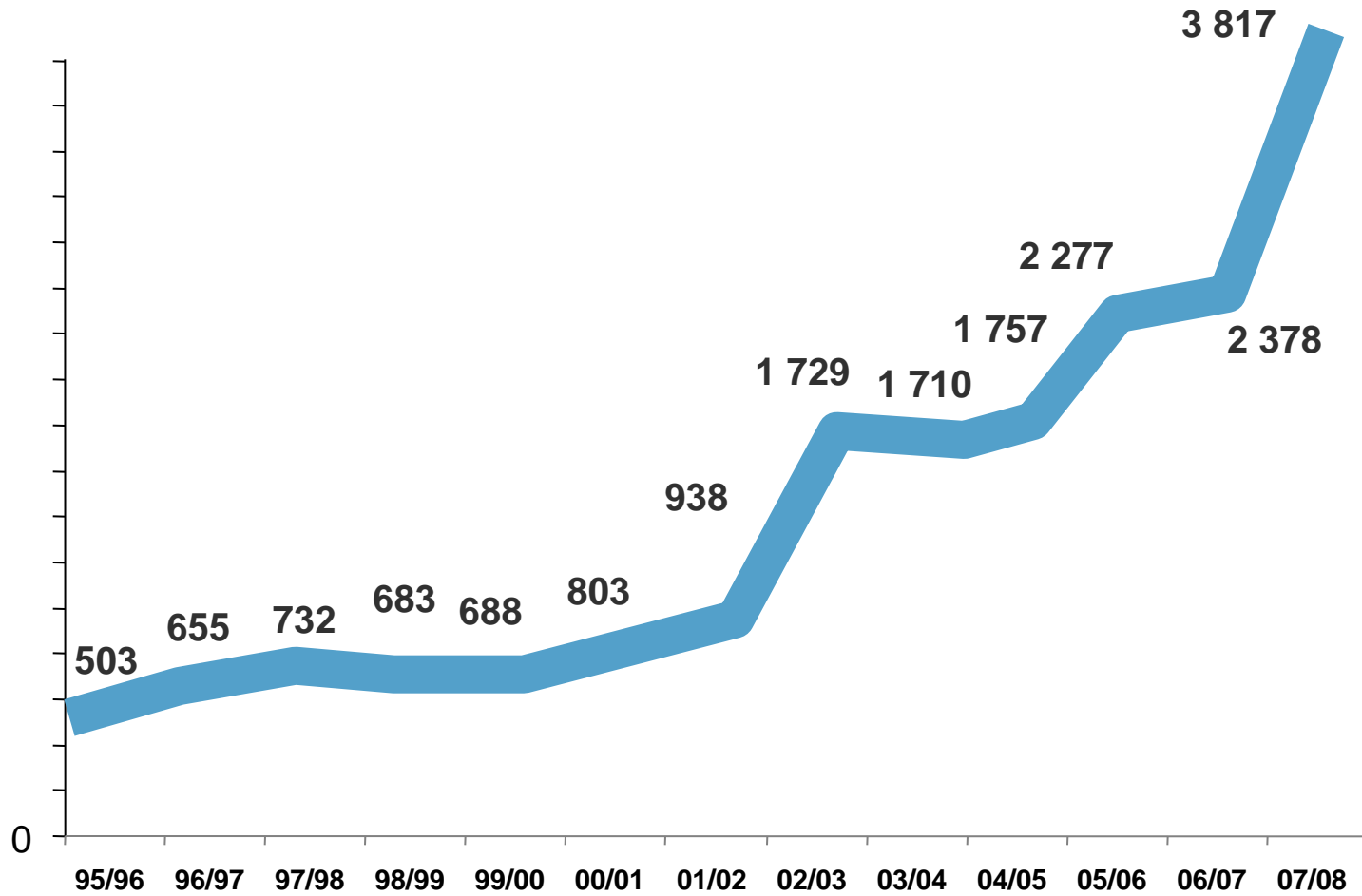
**230 000 ha de canne  
(Brésil, La Réunion  
et Mozambique)**

**500 000 ha de céréales  
(Europe)**

**190 000 ha  
de betteraves (France  
et République  
tchèque)**



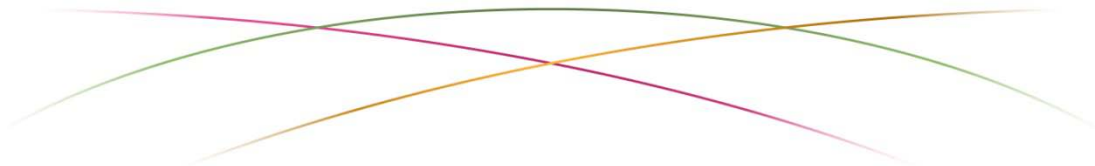
# Consolidated Turnover (M€)



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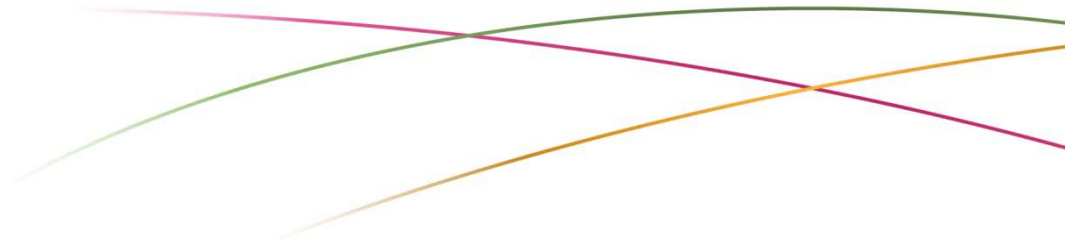
# Tereos, a global player with 2 main Subsidiaries : Guarani, Syral

- Tereos as a group ranks in the top 5 producers worldwide for Sugar as well as for Ethyl Alcohol
- Guarani ranks third in Brazil for sugar cane crushing capacity.
- Syral ranks third in Europe for starch and derivatives.





**Ethanol :**  
**Partial substitution to Petrol.**  
**(no Superseding !)**



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# 10% ethanol into World petrol market

- World Oil : 90 Million baril/day = 4 Billion tons /year
- World Grains (all) : 2 Billion tons /year
- World Petrol = 1,45 Billion m<sup>3</sup>/year
- 10% volume = 145 million M<sup>3</sup>
- 10% énergie = 220 million M<sup>3</sup>
- World Ethanol = 75 million M<sup>3</sup>

**Increase 2 or 3 folds,  
current World Ethanol production**



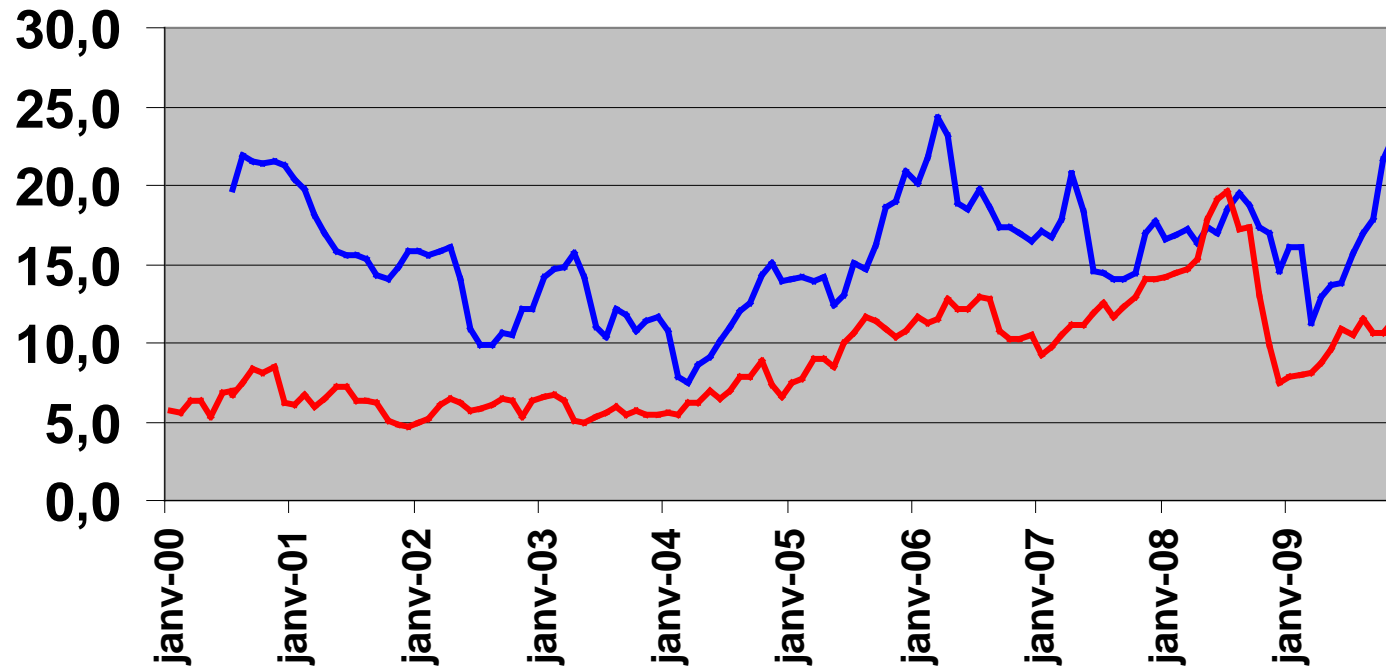


**1st Price Ratio to look at :**

**Ethanol price (€/GJ) ratio  
to Petrol Price (€/GJ)**



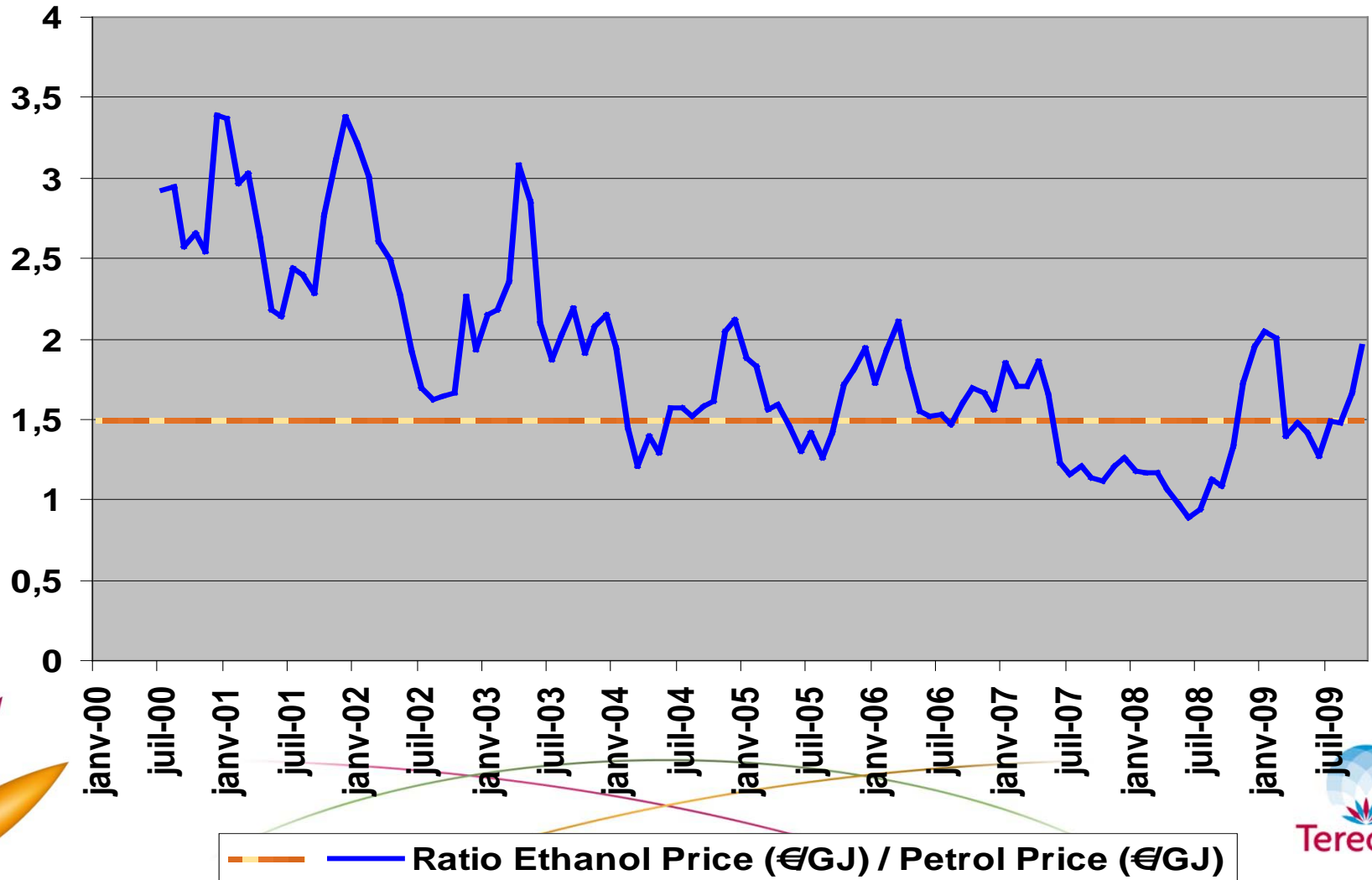
# On the basis of the Energy value, Ethanol price (before Tax) is higher than Petrol: Need for Public support.



— Ethanol Brazil ESALQ €/GJ (tax free)  
— Petrol World Price NYMEX €/GJ (tax free)



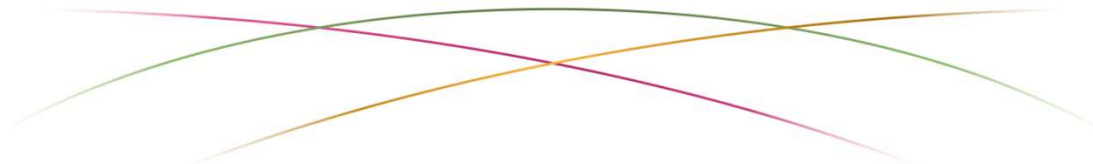
# Price ratio is stabilizing around the level of 1,5. (Volatility 1 to 2)





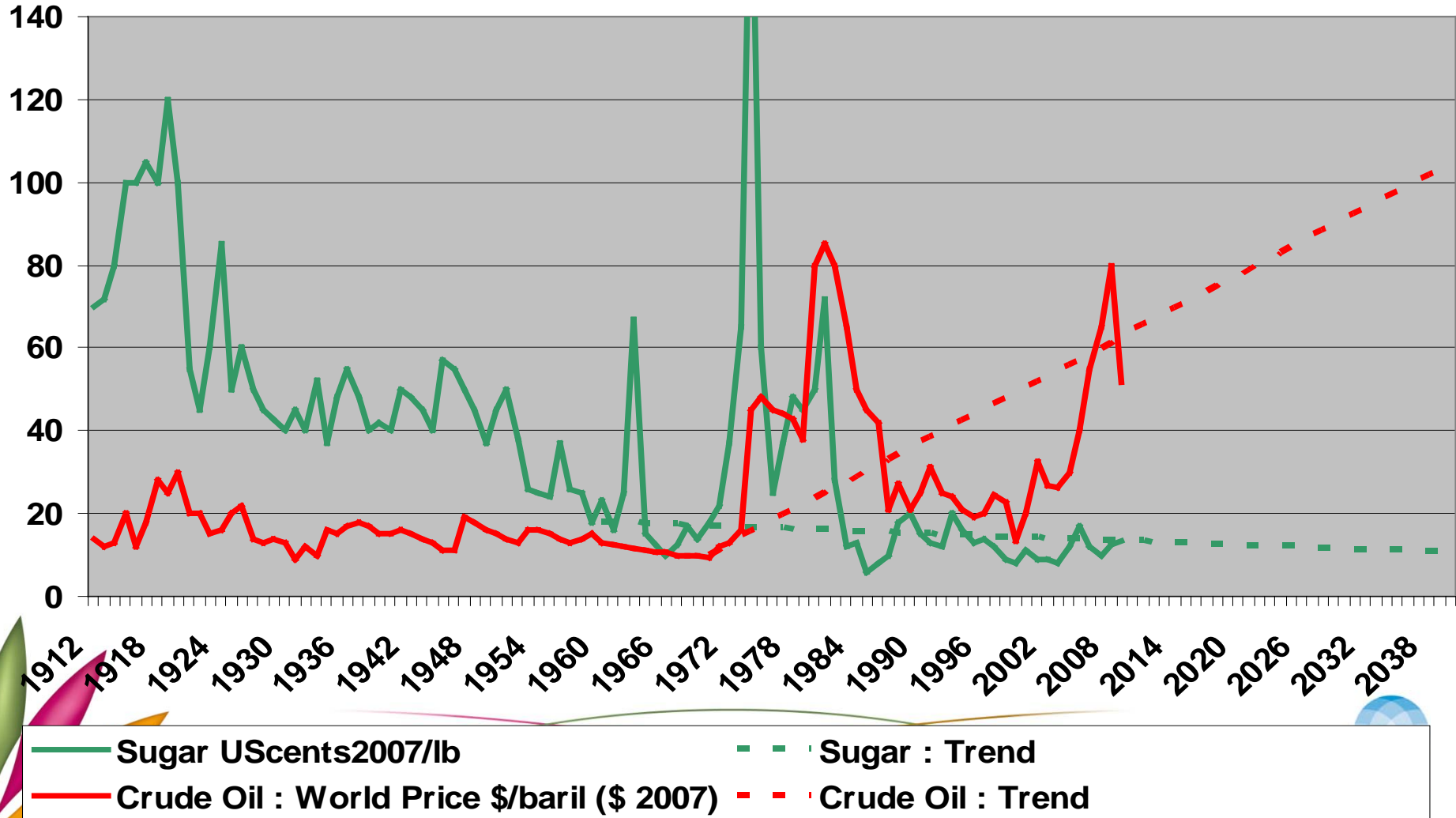
**2nd Price Ratio to look at :**

**Sugar price (\$/100lb or ¢/lb) ratio  
to Crude Oil Price (\$/barel)**



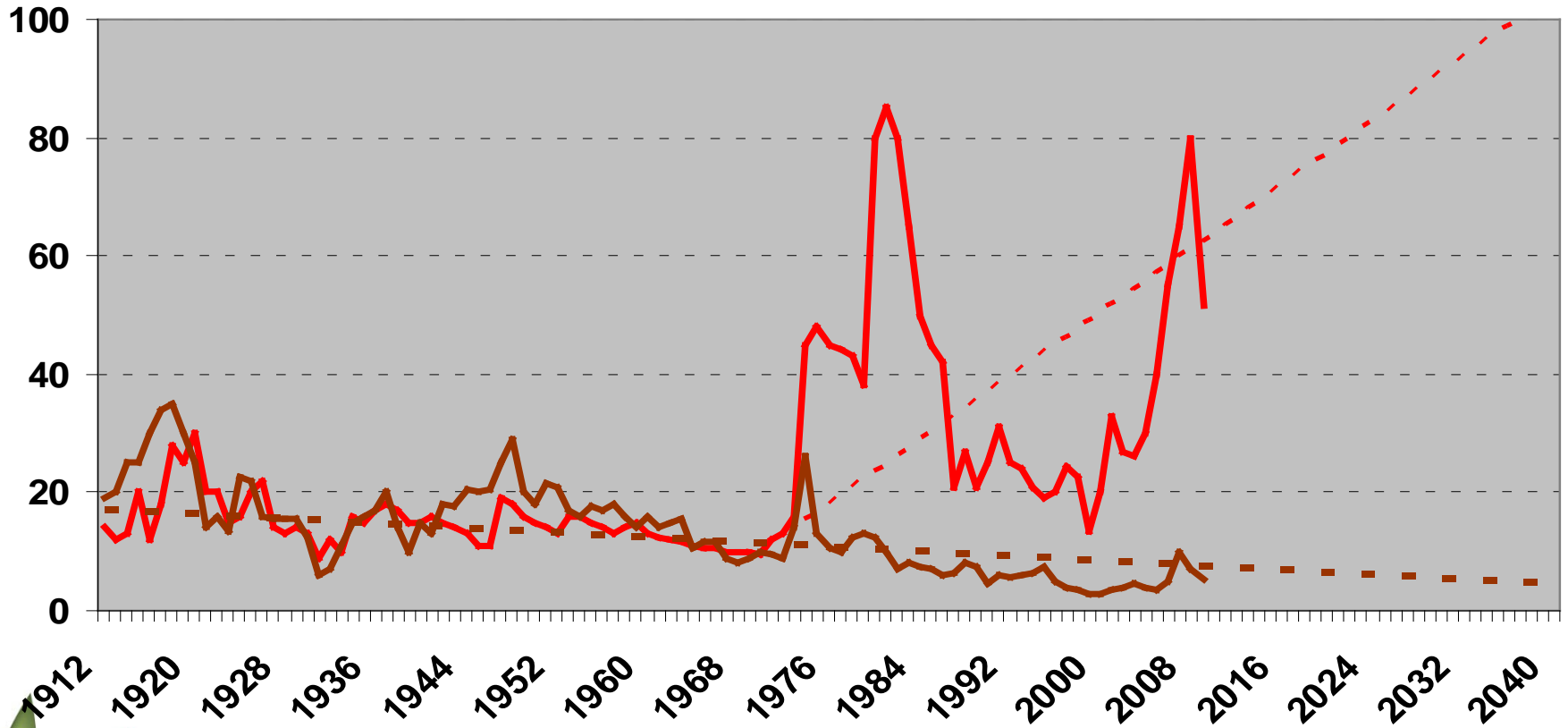
# Sugar gets more and more competitive against Crude Oil

(Source Morgan Stanley)



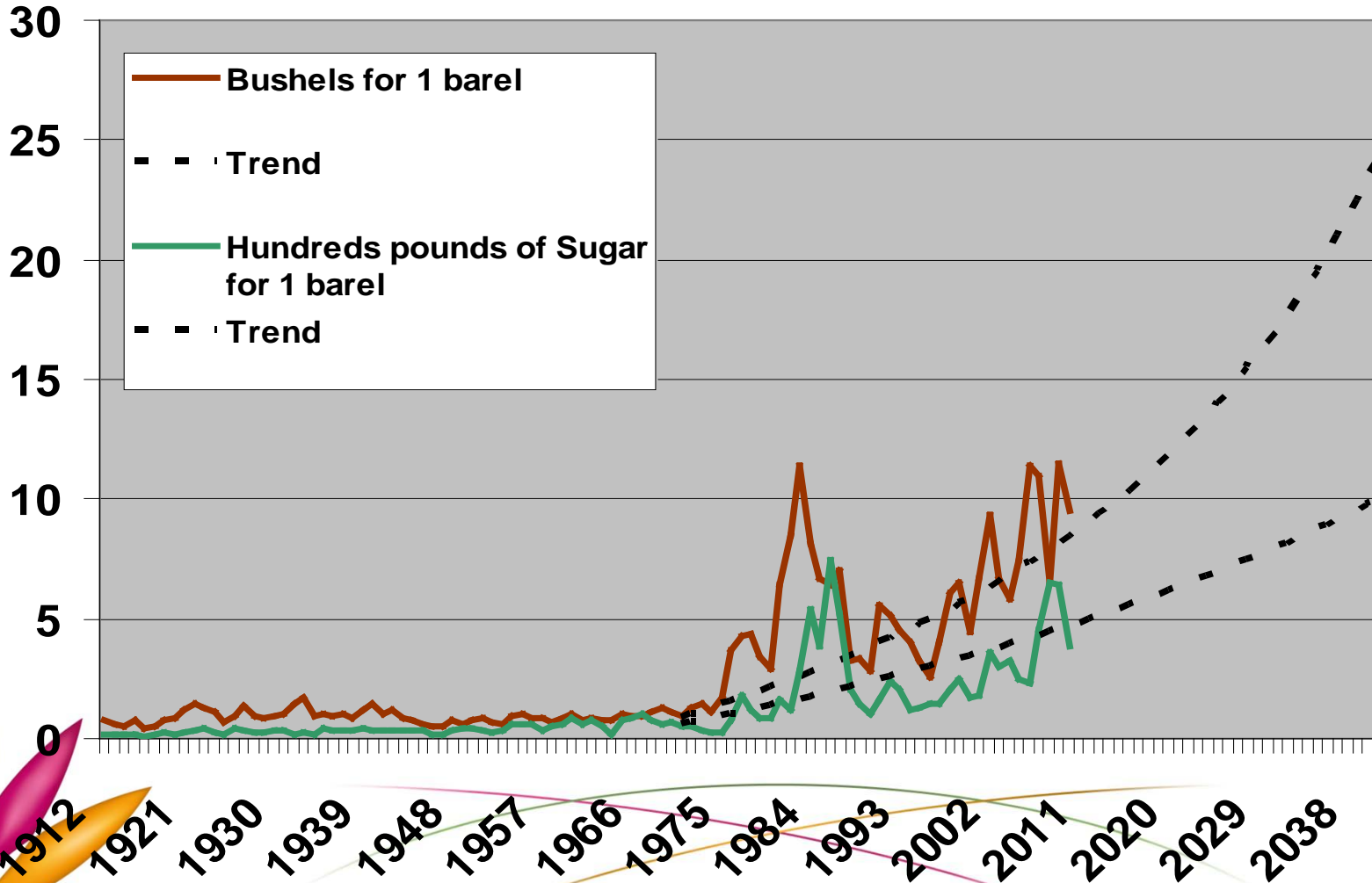
# Fodder Cereals are more and more competitive against crude oil

(Source Morgan Stanley)



— Crude Oil : World Price \$/baril (\$ 2007) - - - Crude Oil : Trend  
— Wheat : World price \$/bushel (\$ 2007) - - - Wheat : trend

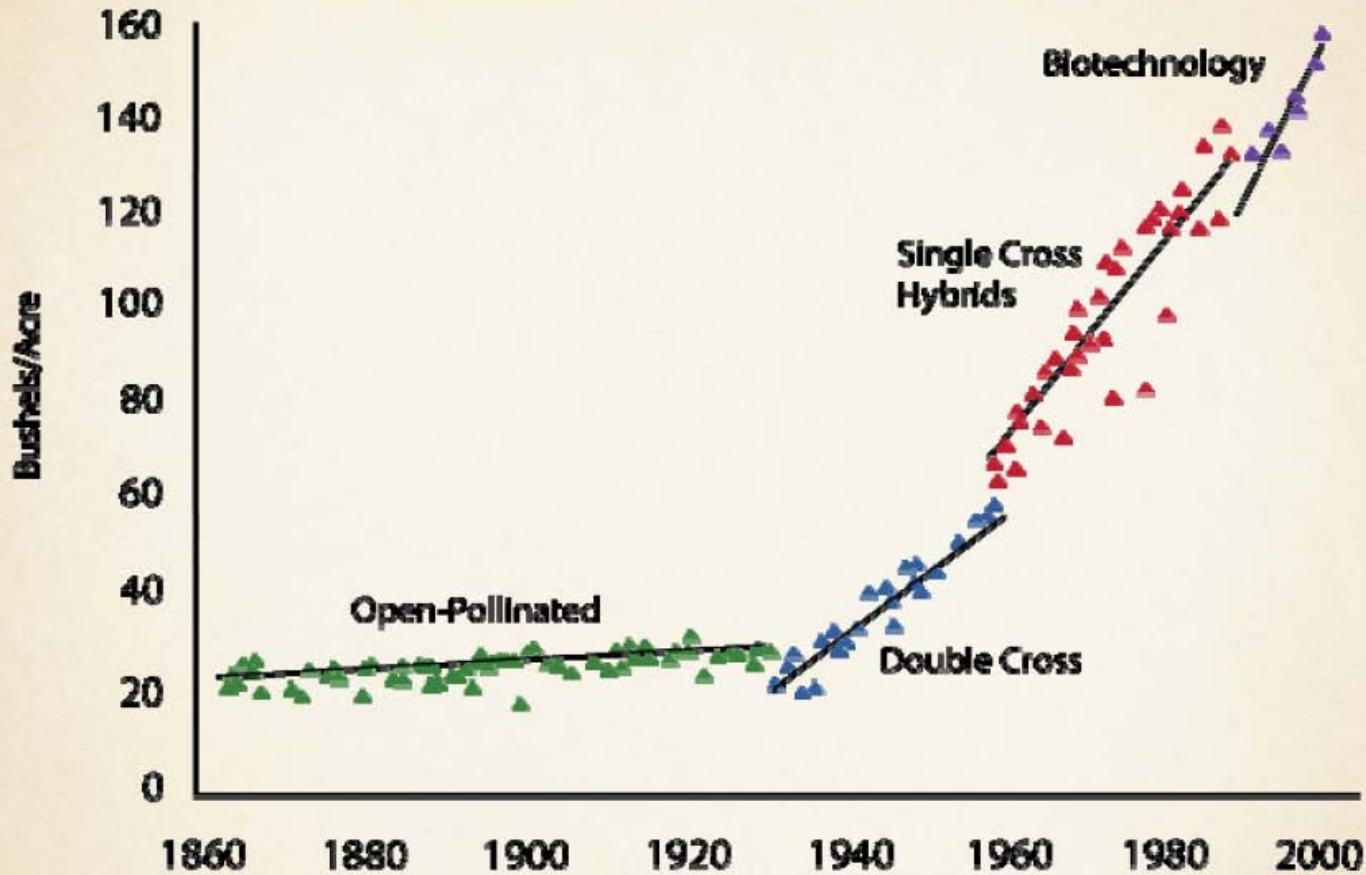
# With current Trends, Agricultural feedstock could get more competitive than Crude Oil before mid century. (Volatility 1 to 3)



# Direct influence of yield increase

## Average U.S. Corn Yields

POET™  
Energy inspired.™



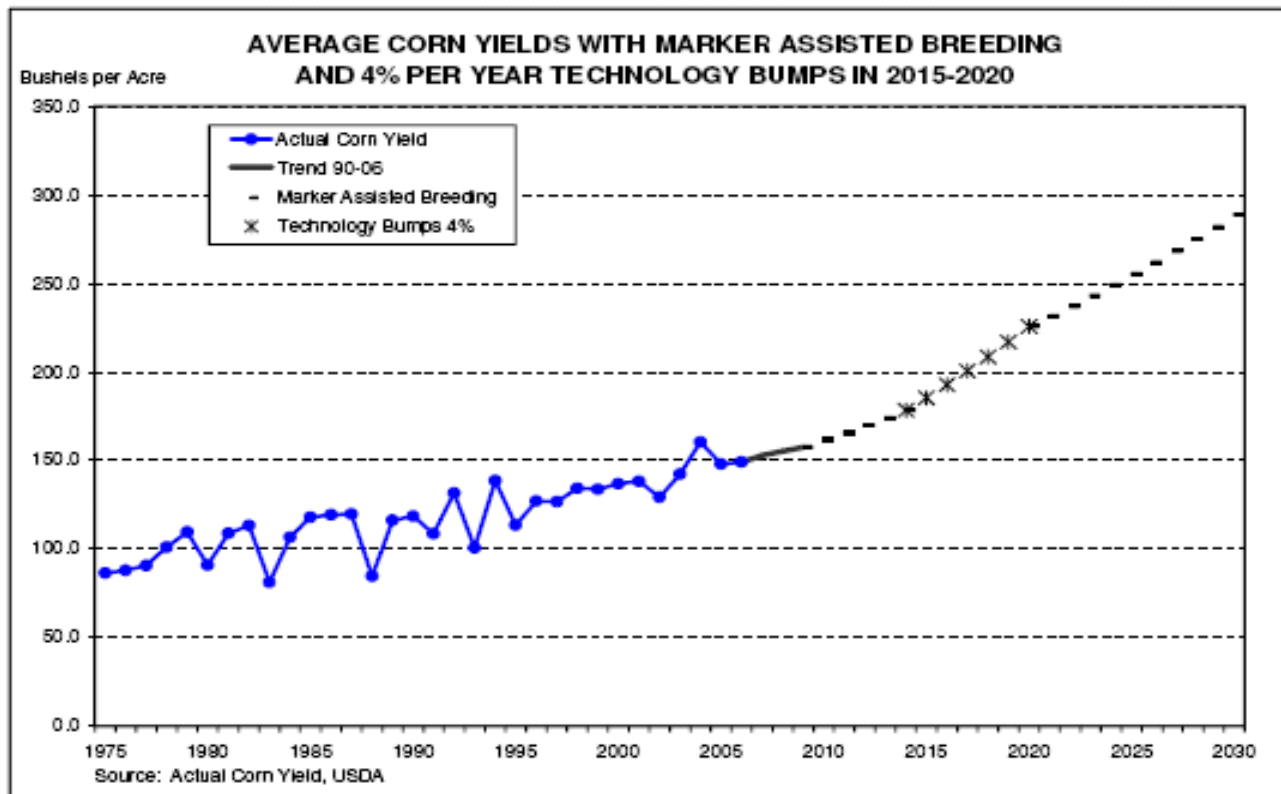
Source: Accenture

CONFIDENTIAL

# For the future, evolution of yield will remain KEY.



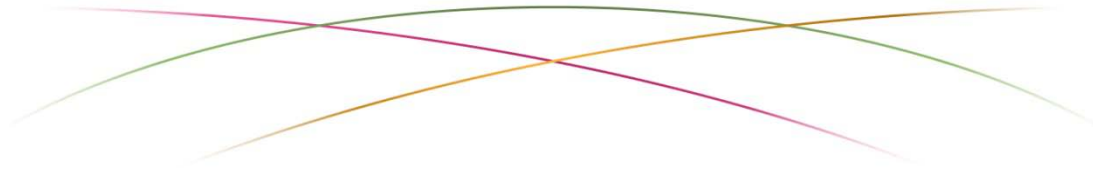
Office of the Chief Economist  
Office of Energy Policy and New Uses





**3rd Price Ratio to look at :**

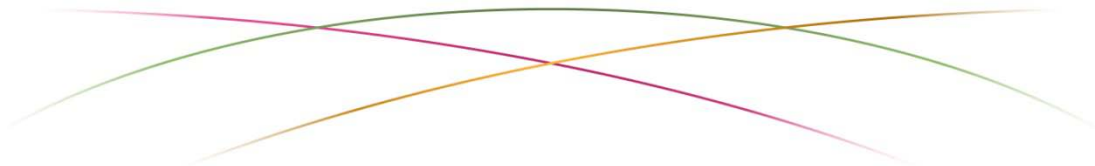
**Sugar price (\$/100lb or ¢/lb) ratio  
to Wheat Price (\$/bushel)**



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# Europe : Fodder Cereals to ethanol deliver Vegetable proteins.

- Less and less Flour wheat but Fodder Cereals.
- 100% of vegetable proteins of the fodder cereals is delivered to feed market.
- Sugar Crops do not deliver any vegetable protein.

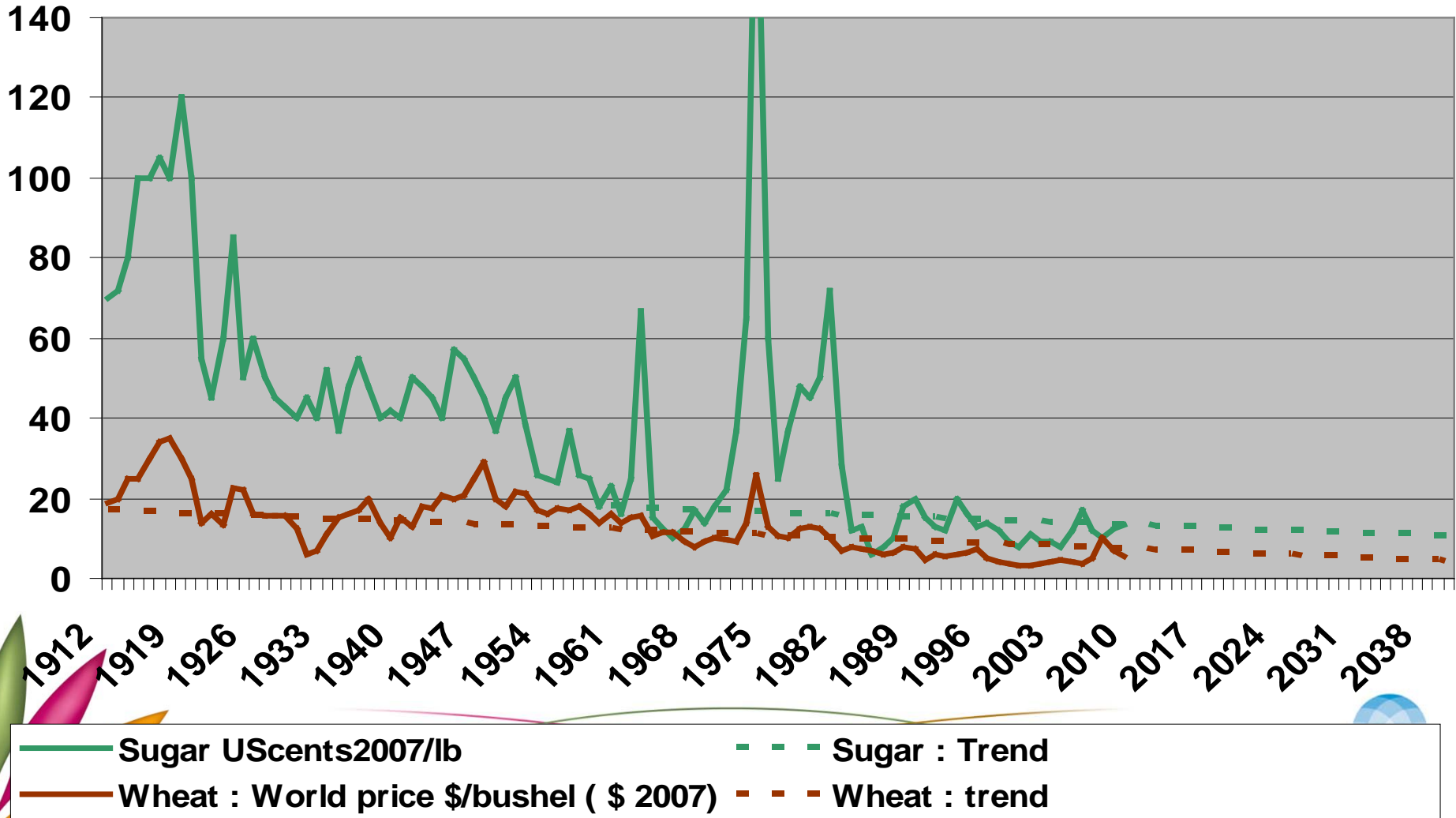


# Fodder Cereals are as efficient as Sugar Crops when bringing in Proteins.

	Energy	Yeast	Vegetable Proteins	Total
Sugar Crops	+++++	=	0	+++++
Fodder Cereals	++	=	++	+++++



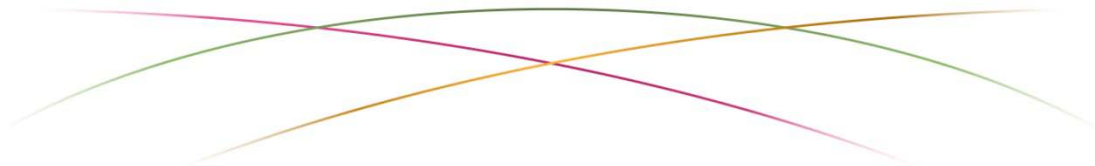
# Sugar and Wheat on the same Trend on long term.



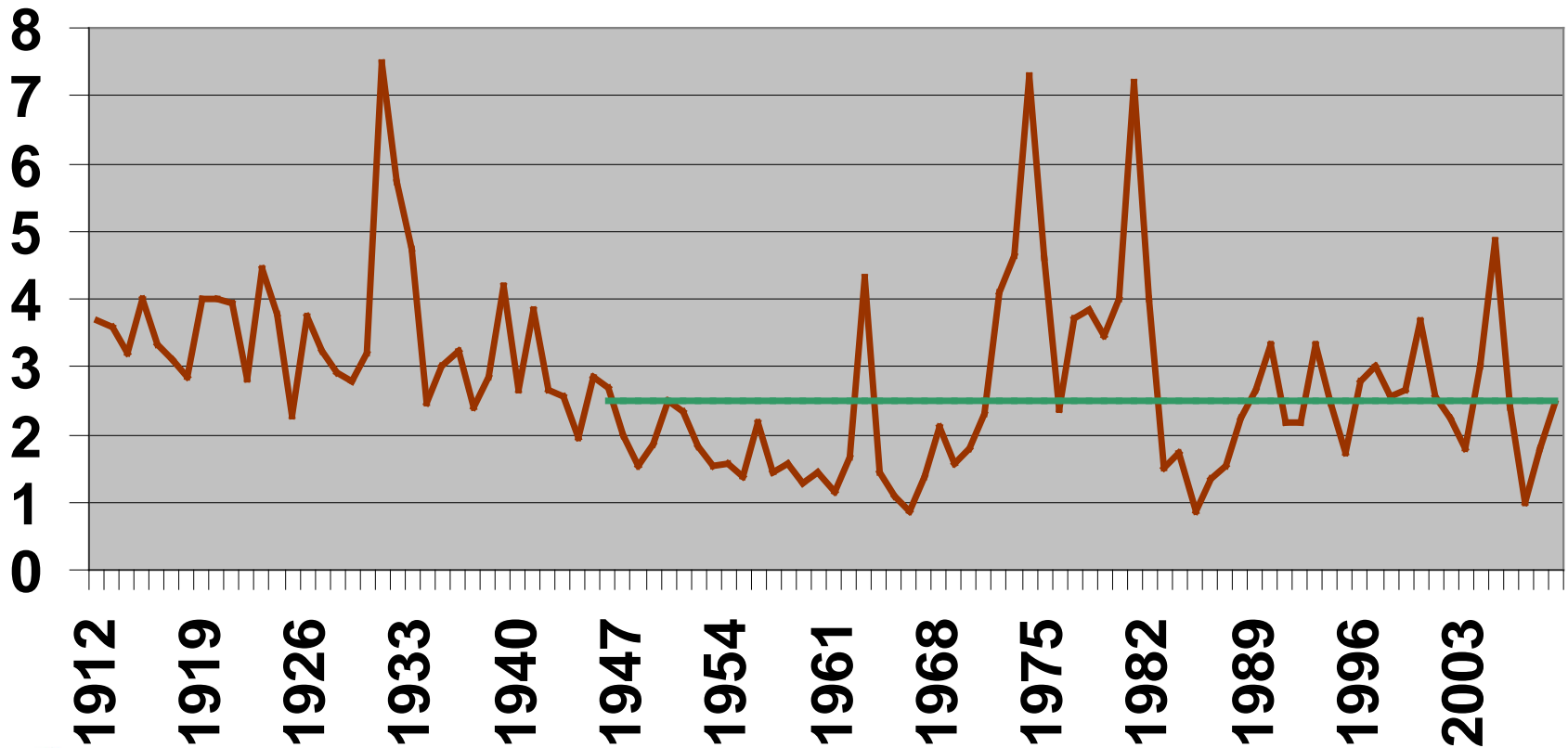
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# Cereals compared to sugar for ethanol production

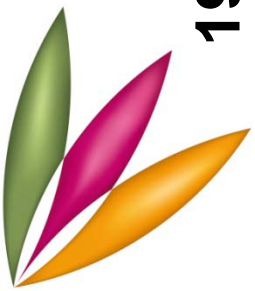
- 19 bu of wheat produces
  - Sugar equivalent 7,7 hundred lb
  - Proteins : 57 kg
- **Hypothesis** : the value of proteins compensates the difference in processing costs between wheat process and Sugar crops process,
- Equilibrium is at :
  - 19 bushels for 7,7 hundred pounds
  - $19 / 7,7 = 2,47$



The historical Wheat to sugar ratio is very close to equilibrium ratio : 2,5 against 2,47 (Volatility of 1 to 7)



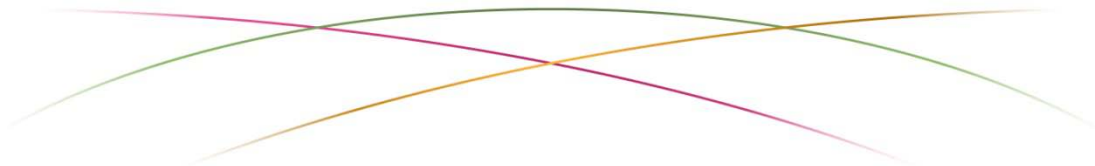
— Bushel of wheat for a hundred pounds sugar  
— Average World War II = 2,5



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# On the long term, fodder cereals are competitive against Sugar Crops

Provided that the value of proteins compensates the difference in processing costs between cereal process and Sugar crop process





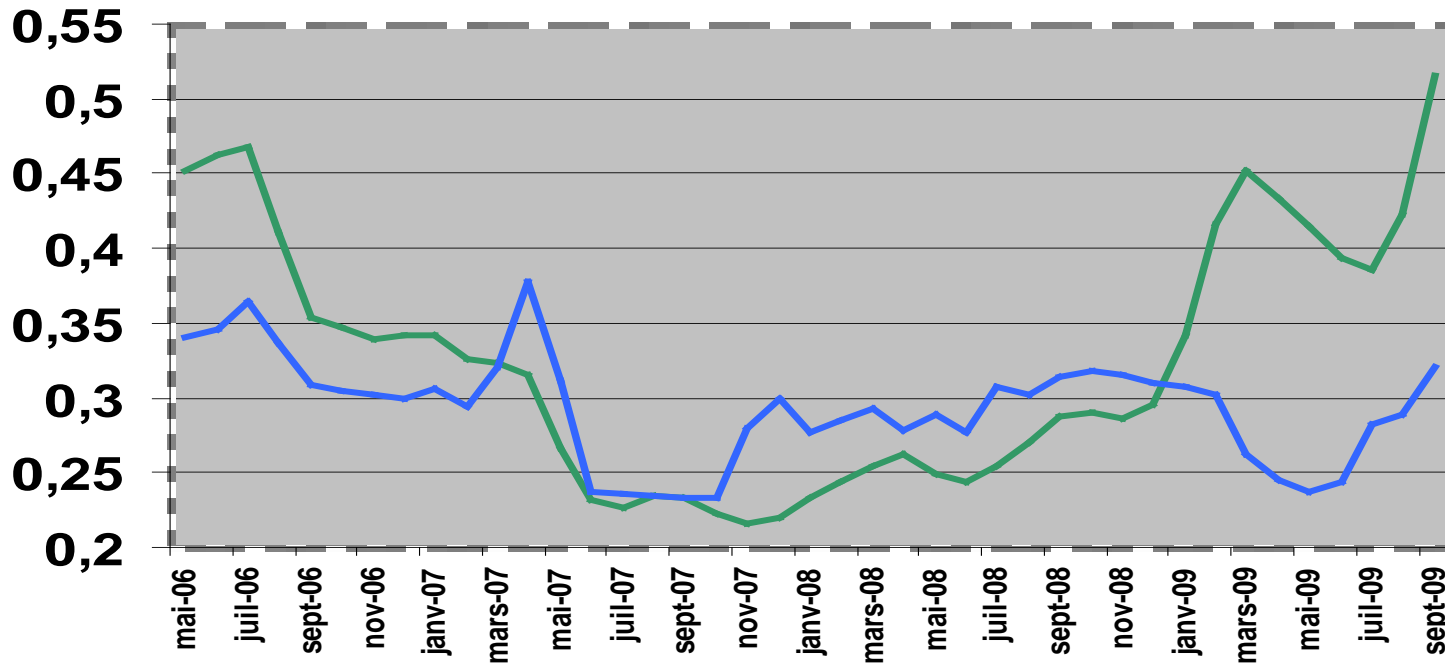
**4 th Price Ratio to look at :**

**Sugar Cane price for Ethanol ratio  
to Sugar Cane price for Sugar  
(R\$/kgATR)**



# Sugar delivers higher revenue than ethanol at present time.

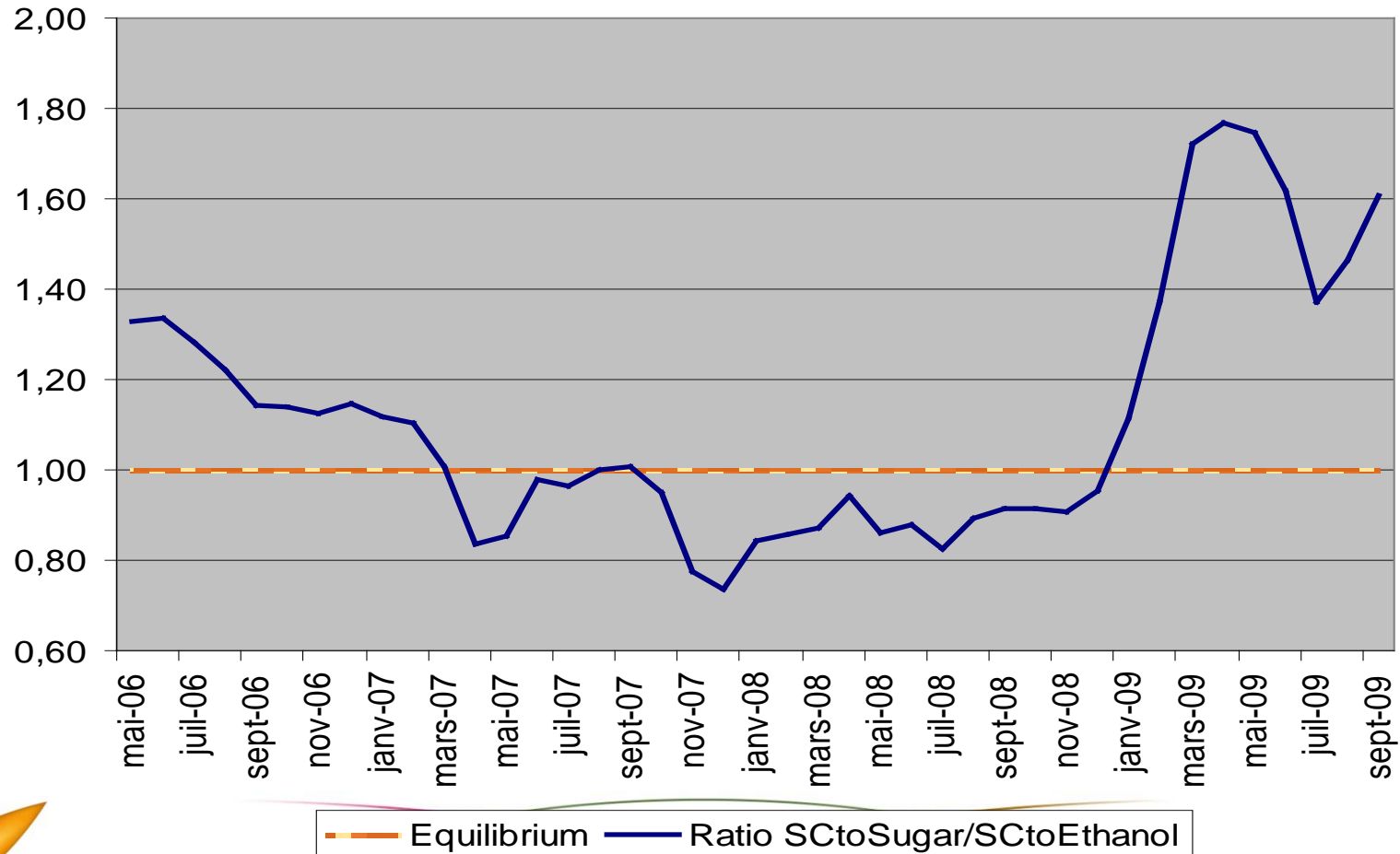
(Price, R\$ per kg ATR Consecana Formula)



— Cane for Sugar Brazilian market  
— Cane for anhydrous ethanol Brazilian market

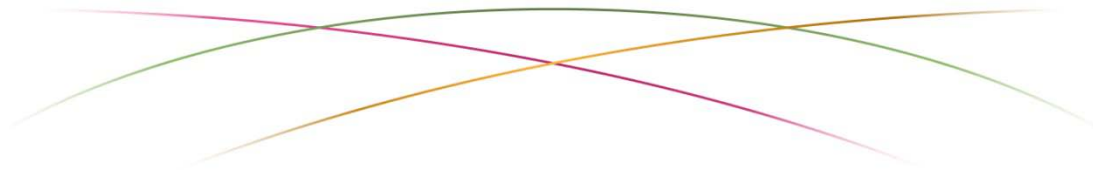


# Ratio varies between 0,8 and 1,8 : volatility of 1 to 2





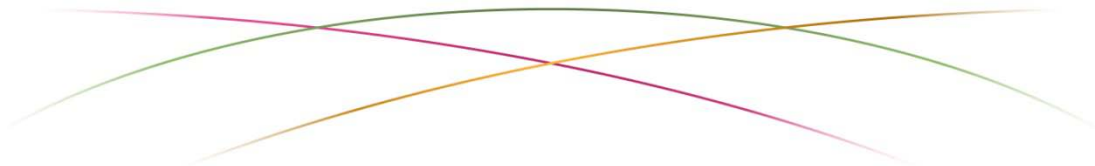
**Biomass for 2<sup>nd</sup> Gen : 5th ratio to look at  
is petrol price/ natural gaz price**



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# Biomass may be a feedstock for both 1st Gen and 2<sup>nd</sup> Gen

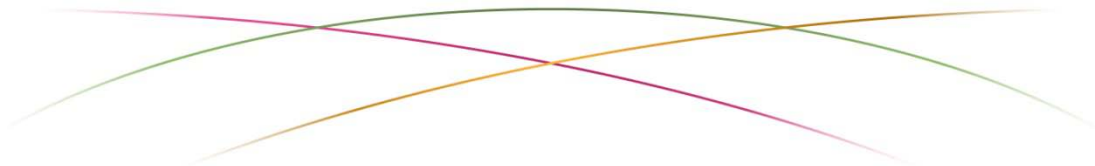
- 1st Gen crops provide with biomass : bagasse, straw, bran, cobs, pulp....
- Either Biomass may but used to provide heat for the production of 1st Gen biofuels
- Or Biomass may but used to provide Sugars or Carbohydrates to be transformed into 2<sup>nd</sup> Gen Biofuels
- Profitability of the one or the other will depend on the ratio of prices Petrol/Natural Gaz



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# Conclusion : Ethanol development is Sustainable

- Profitability depends on the combination of 5 ratios, each having a high volatility
- Combined volatility is itself high
- Combination of 1st and 2<sup>nd</sup> Gen Biofuels in one single plant.
- Need for
  - long term commitment between Shareholders and Suppliers
  - Consistency in Public Policies





**2009**

