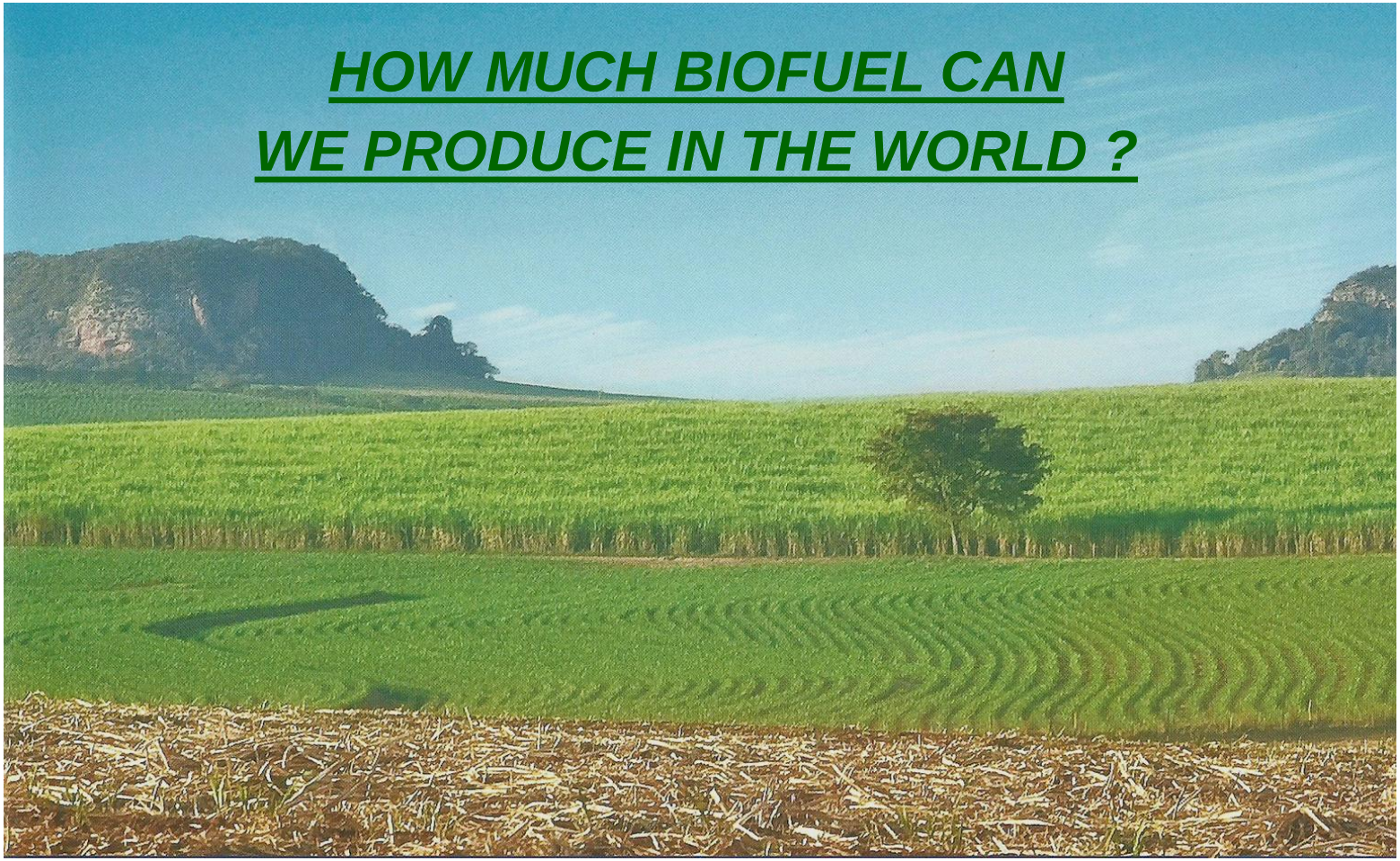


1st Brazilian BioEnergy Science and Technology Conference

LUIZ CARLOS CORRÊA CARVALHO, ABAG

CAMPOS DO JORDÃO, 15/08/2011

WORLD ETHANOL BALANCE (billion litres)

	Production			Consumption			Surplus/Deficit			Trade	Trade %
	Total	*Fuel*	*Other*	Total	*Fuel*	*Other*	Total	*Fuel*	*Other*	Total	Production
1998	33.6	*18.7*	*14.8*	32.2	*17.1*	*15.1*	1.4	*1.7*	*-0.2*	2.1	6.3%
1999	33.3	*18.0*	*15.3*	33.3	*17.7*	*15.6*	-0.1	*0.3*	*-0.3*	1.9	5.6%
2000	31.0	*16.2*	*14.8*	32.4	*17.2*	*15.2*	-1.4	*-1.0*	*-0.4*	2.3	7.4%
2001	32.7	*17.8*	*14.9*	32.5	*16.8*	*15.6*	0.2	*0.9*	*-0.8*	2.5	7.7%
2002	35.6	*20.3*	*15.3*	36.2	*20.0*	*16.2*	-0.5	*0.3*	*-0.8*	2.6	7.3%
2003	41.1	*24.7*	*16.4*	39.1	*22.4*	*16.6*	2.1	*2.3*	*-0.2*	2.8	6.7%
2004	44.1	*28.0*	*16.1*	44.7	*27.4*	*17.3*	-0.6	*0.6*	*-1.2*	4.0	9.1%
2005	48.3	*31.8*	*16.5*	49.3	*31.1*	*18.1*	-1.0	*0.7*	*-1.6*	4.7	9.7%
2006	57.9	*38.5*	*19.4*	56.4	*36.4*	*19.9*	1.5	*2.1*	*-0.5*	6.4	11.1%
2007	69.5	*50.1*	*19.4*	67.1	*47.3*	*19.8*	2.4	*2.8*	*-0.4*	6.7	9.7%
2008	85.8	*67.7*	*18.2*	83.5	*63.5*	*19.9*	2.3	*4.1*	*-1.8*	8.6	10.0%
2009	91.3	*73.7*	*17.6*	92.6	*73.5*	*19.2*	-1.3	*0.3*	*-1.6*	6.1	6.6%
2010	105.0	*86.2*	*18.8*	104.2	*84.0*	*20.2*	0.8	*2.2*	*-1.4*	5.9	5.6%
2011	109.2	*90.5*	*18.7*	110.4	*90.1*	*20.3*	-1.2	*0.4*	*-1.6*	6.0	5.5%

Source: LMC Ethanol Quartely – Second Quarter 2011.

WORLD ETHANOL PRODUCTION

	LITERS
2005	24,6 bi l
2011	106 – 113 bi l
% p.y.	27,5 to 28,9%

"I think it's fair to say that the era of cheap feedstocks for all biofuels is behind us".

Frederick L. Potter, Executive Vice President of Hart Energy, June 2011.

BIOFUELS AND STRATEGIC VIEW:

MAIN POINTS:

1. SUSTAINABILITY (Includes competitiveness)
2. SUPPLY CAPACITY (Medium, long run)
3. IS IT AN ENERGY PRODUCT ? (Or agriculture and barriers?)
4. TECHNOLOGY DEVELOPMENT (Potential rupture or not ?)

SENSE OF URGENCY:

GHG AND PROBLEMS ; PEAK OF OIL;

PRICES AND VOLATILITY

BIOFUELS GENERATIONS

1ª GENERATION : ETHANOL (ONLY CANE IS APPROVED)
BIODIESEL (?)
2ª GENERATION : PRODUCTION COST IS A PROBLEM
THE WINNERS (TECHNOLOGY) ARE.....
3ª GENERATION :
WE DON'T BELIEVE IN THE 2ª AND THEN CREATE THE 3ª.....

A POPULAR PHRASE ABOUT GENERATIONS :
" RICH FATHER, NOBLE SONS, POOR GRANDSONS "

BIOFUELS AND POLICIES
WHAT DO WE HAVE TODAY ?

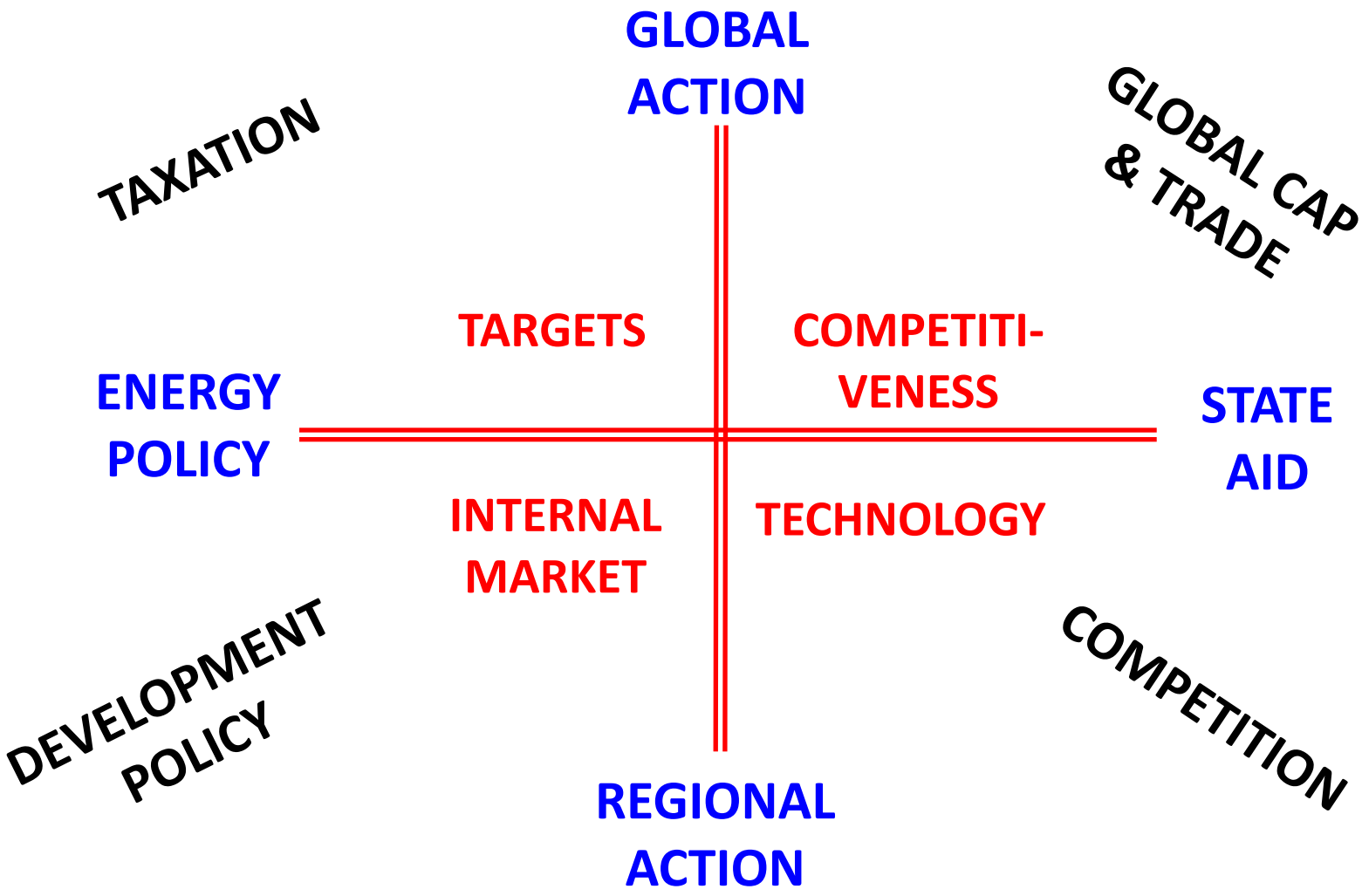
POSITIVE DRIVERS

- Scale of supply and know how
- CO_2 mitigation
- Decentralized production globally
- Investment in technology
- Global understanding
- Mandates

NEGATIVE DRIVERS

- Impacts of land use and food
- Lower grains life cycle
- Production costs
- Capital resources
- Global attitude (sense of urgency)
- No government commitments

BIOFUELS:
A COMPLEX POLICY



FOUR CRITERIA FOR BIOFUELS[1] TO MEET:

- LOW COST
- LOW CARBON
- SCALABLE
- SUSTAINABLE

"Brazil was the only place where all four could be meet. However, there are few new ethanol plants in Brazil, and it appears that the market is tightening".

(1) Philip New, CEO of BP Biofuels, World Biofuels Market, March 2011, Rotterdam, The Netherlands.

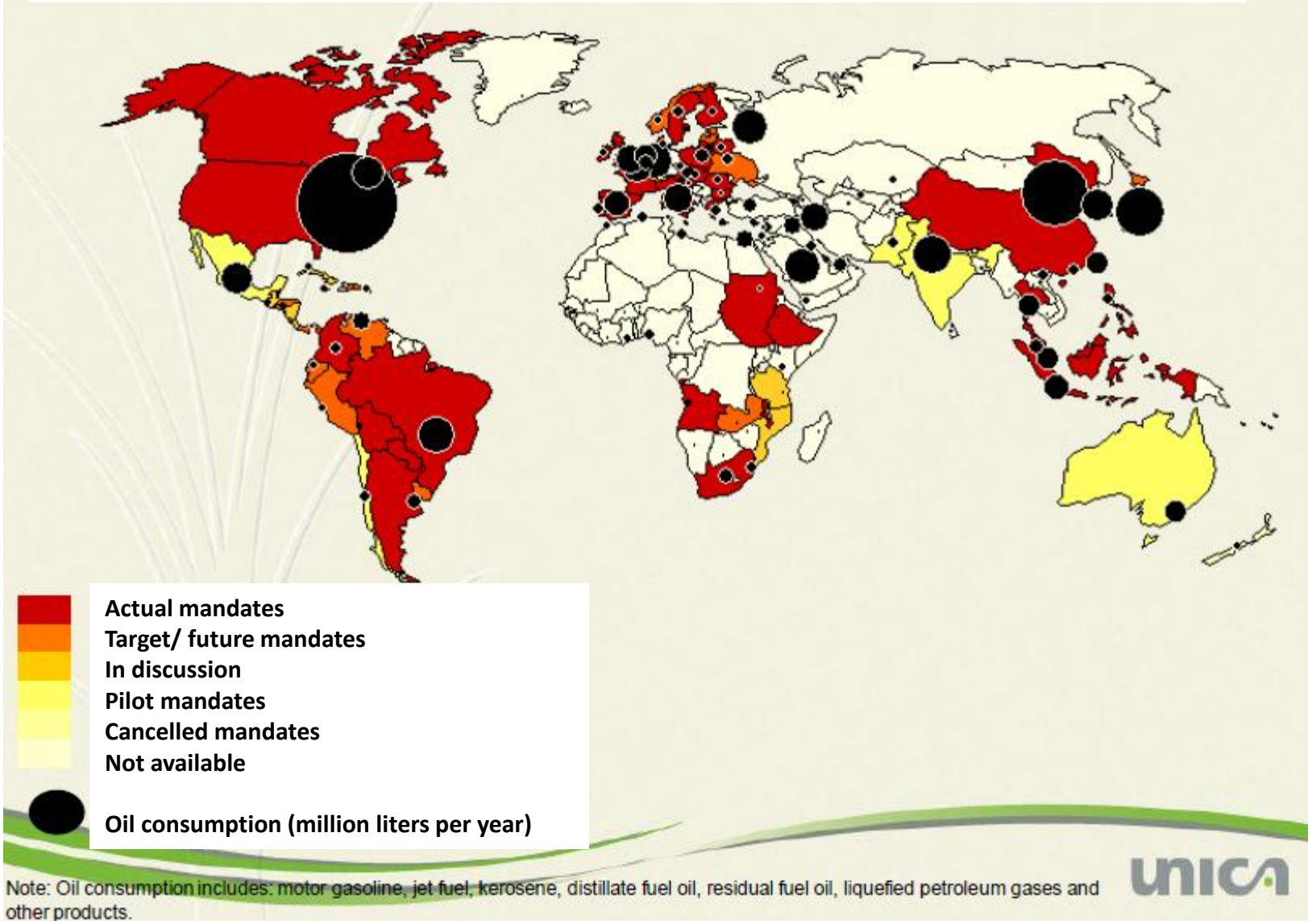
Projected ethanol production in key producing countries (billion litres)

	Total Ethanol Production			Fuel Ethanol		
	2010	2011	Change	2010	2011	Change
US	50.9	54.1	6%	49.5	52.6	6%
Brazil	28.3	27.6	-3%	26.9	26.1	-3%
EU	6.8	8.2	20%	5.1	6.5	27%
China	5.9	6.1	4%	2.0	2.1	6%
India	2.1	2.6	24%	0.2	0.6	287%
Canada	1.6	1.7	11%	1.4	1.5	12%
Russia	0.7	0.7	-6%	0.1	0.1	0%
South Africa	0.4	0.5	28%	0.0	0.1	na
Thailand	0.8	0.8	10%	0.6	0.7	16%
Colombia	0.3	0.4	33%	0.3	0.4	25%
Others	5.6	6.6	16%	1.1	1.9	64%
World Total	**103.5**	**109.3**	**6%**	**87.1**	**92.6**	**6%**

24,0 - 15%

Sources: Industry sources, LMC estimates.

BIOFUEL PROGRAMS AND OIL CONSUMPTION

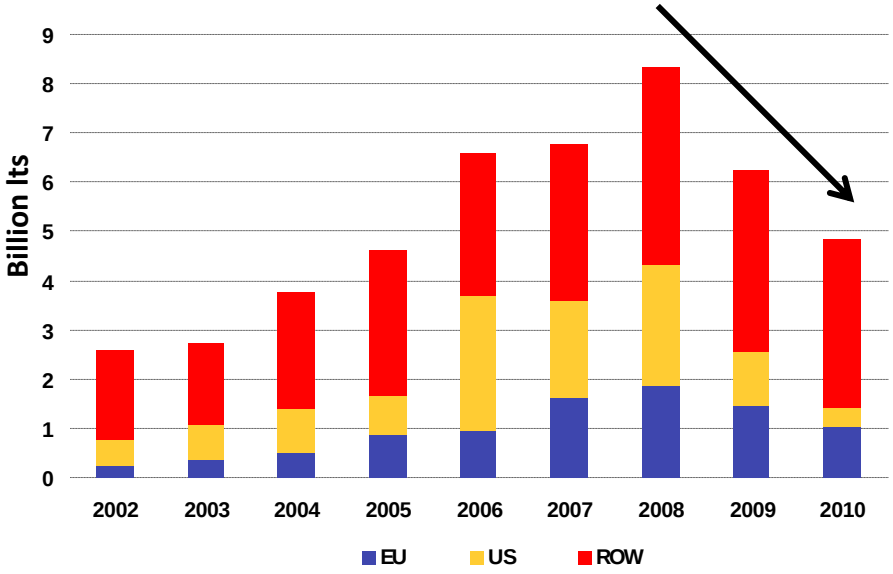


Source: ***Luiz Fernando do Amaral, Unica***

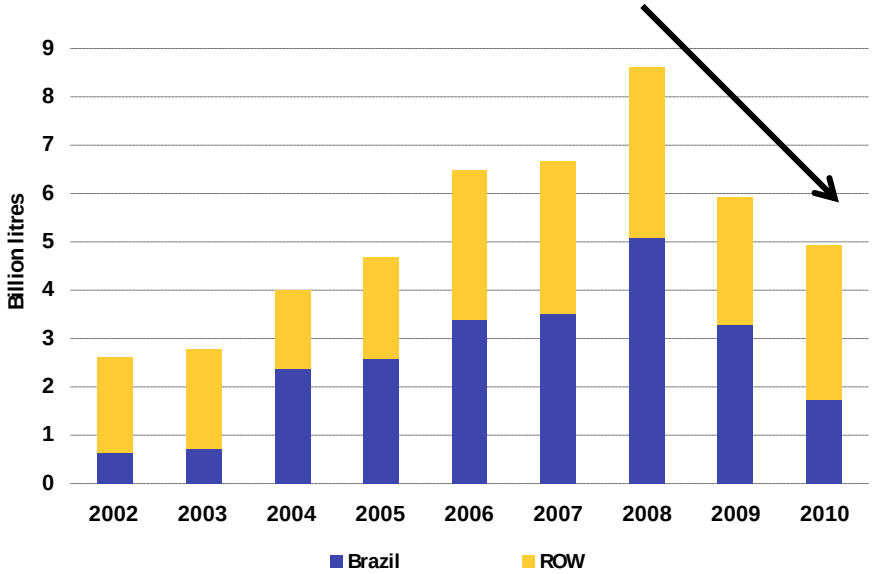
The world ethanol commerce still didn't corresponded to expectations

It come reducing since 2008

Global Imports



Global Exports



Source: LMC International.

"If the 20th century had been the century of oil, the 21st century would be the one of biology".

Alan Shaw, CEO of Codexis, **World Biofuels Market,March 2011, Rotterdam, The Netherlands.**

BIOFUEL	TOTAL TRANSPORT FUEL
TODAY	2% (IEA)
2030	20% (BP)
2050	27% (IEA)

CONTROVERSIAL PROBLEMS:

-Food vs Fuel Debate

- Biofuels' Sustainability

- Indirect Land Use Change

→ ***Answers:*** *Cane in Brazil / Next-generation biofuels*

"Until we have consistent policy that can allow business to plan over decades not over singular years then I think you're going to get stagnation in this broad renewables industry".

John McCarthy, CEO, Qteros

TRENDS
INTERNATIONAL MARKET OF COMMODITIES

"XIX to XX: 100 years of very low commodities prices, was responsible for the faster industrialization process. Now with China and India, we are remembering England domination period demanding commodities".

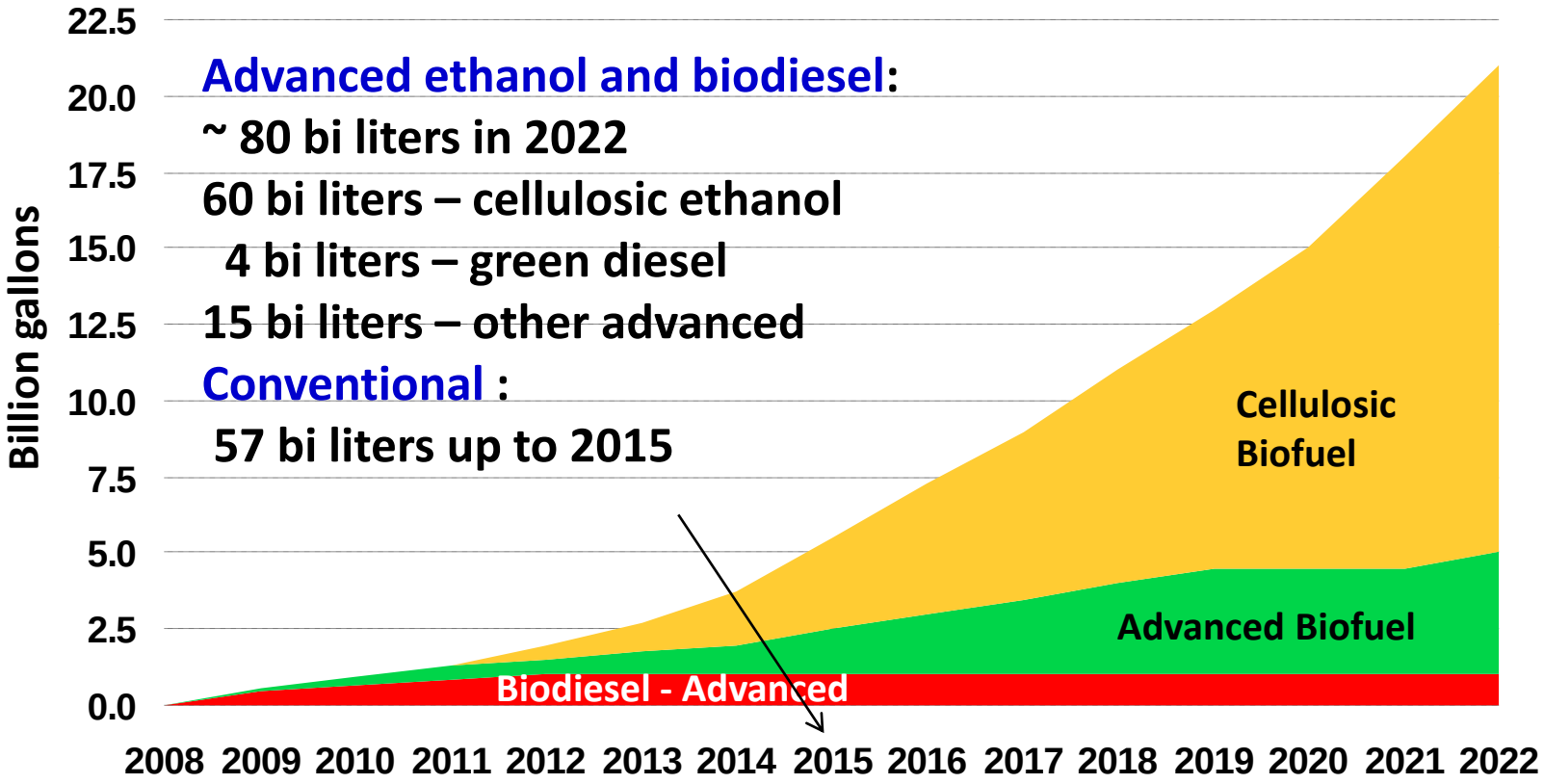
Edmar Bacha, O Valor, 22/12/10

USA AND THE RISING OF THE WORLD ETHANOL DEMAND

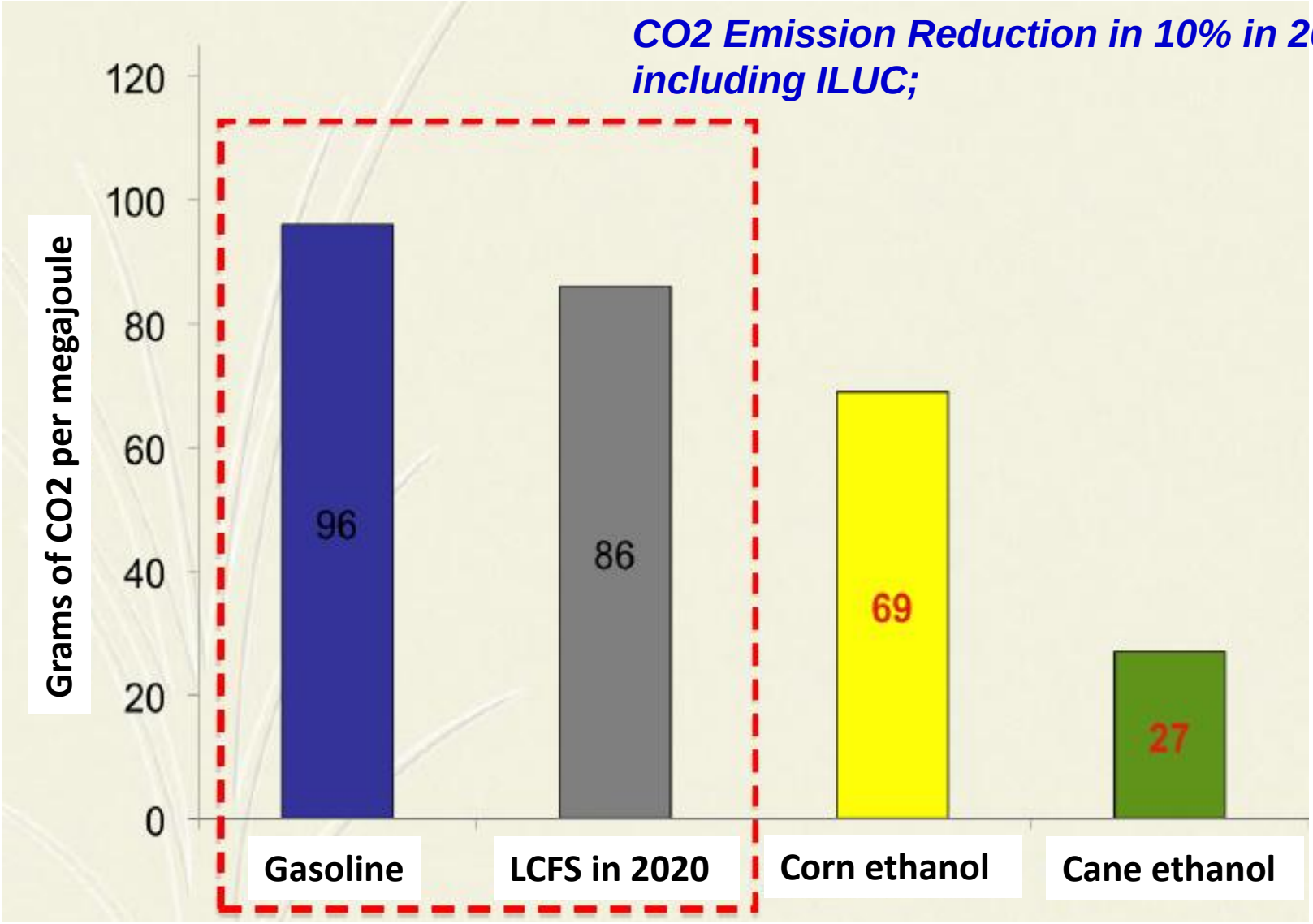
THE RFS – 2 FEDERAL MANDATE

RFS: Advanced biofuel (no differenced) Mínimum of 5 bi gallons (18 bi liters)

Cane ethanol can capture part of the cellulosis quota *(if the EPA transfer it quota or if blenders buy it out of its obligation)*



USA - CALIFORNIA
LCFS & BIOFUELS



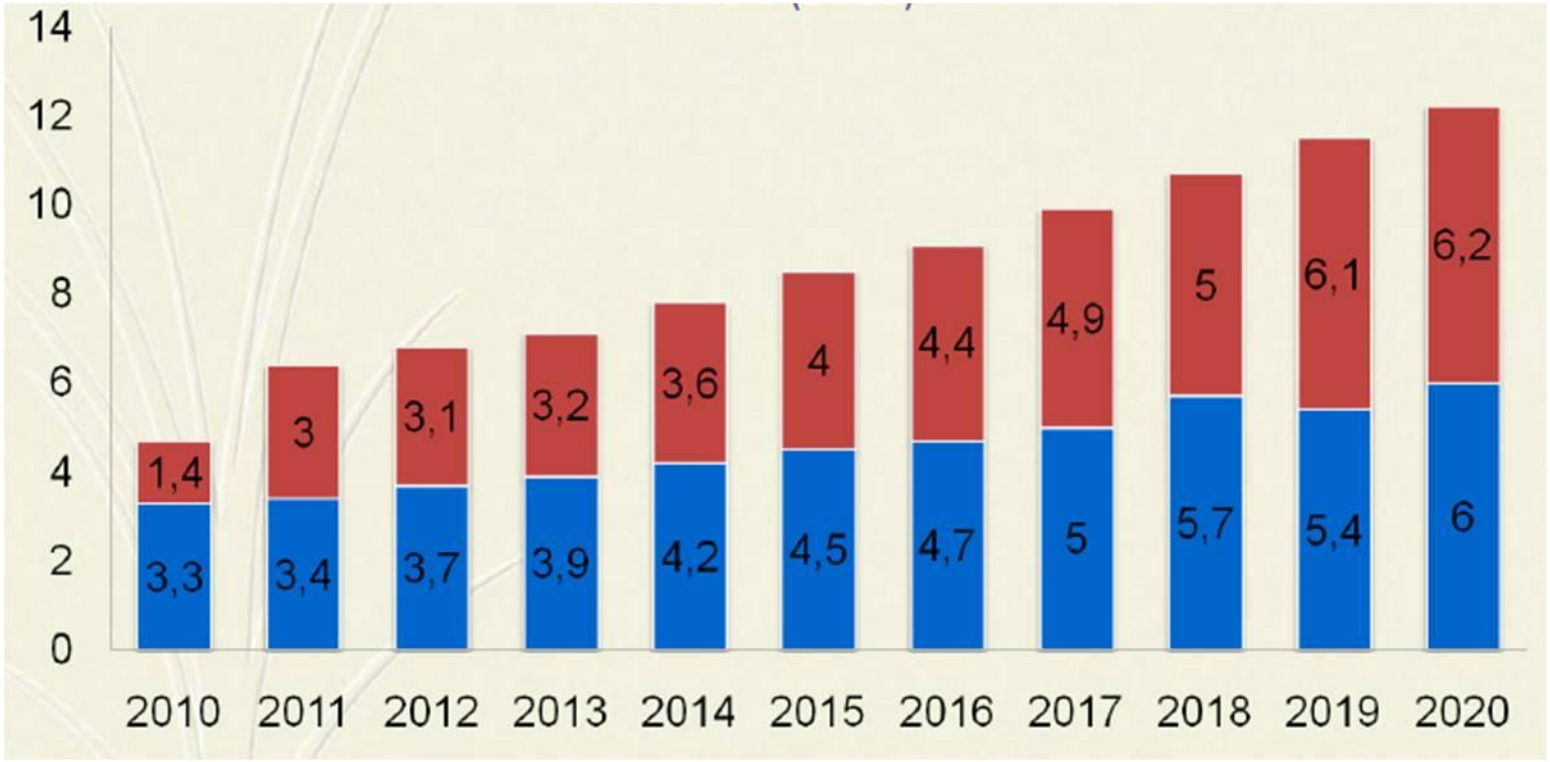
Source: California Air Resources Board´s Low Carbon Fuel Standard, march 2009, adapted by Unica

EUROPEAN DIRECTIVE FOR RENEWABLE ENERGY PROMOTION

- **Mandatory target of use :**
  10% of renewable energy in the transport up to 2020.

- **Certification for sustainability**

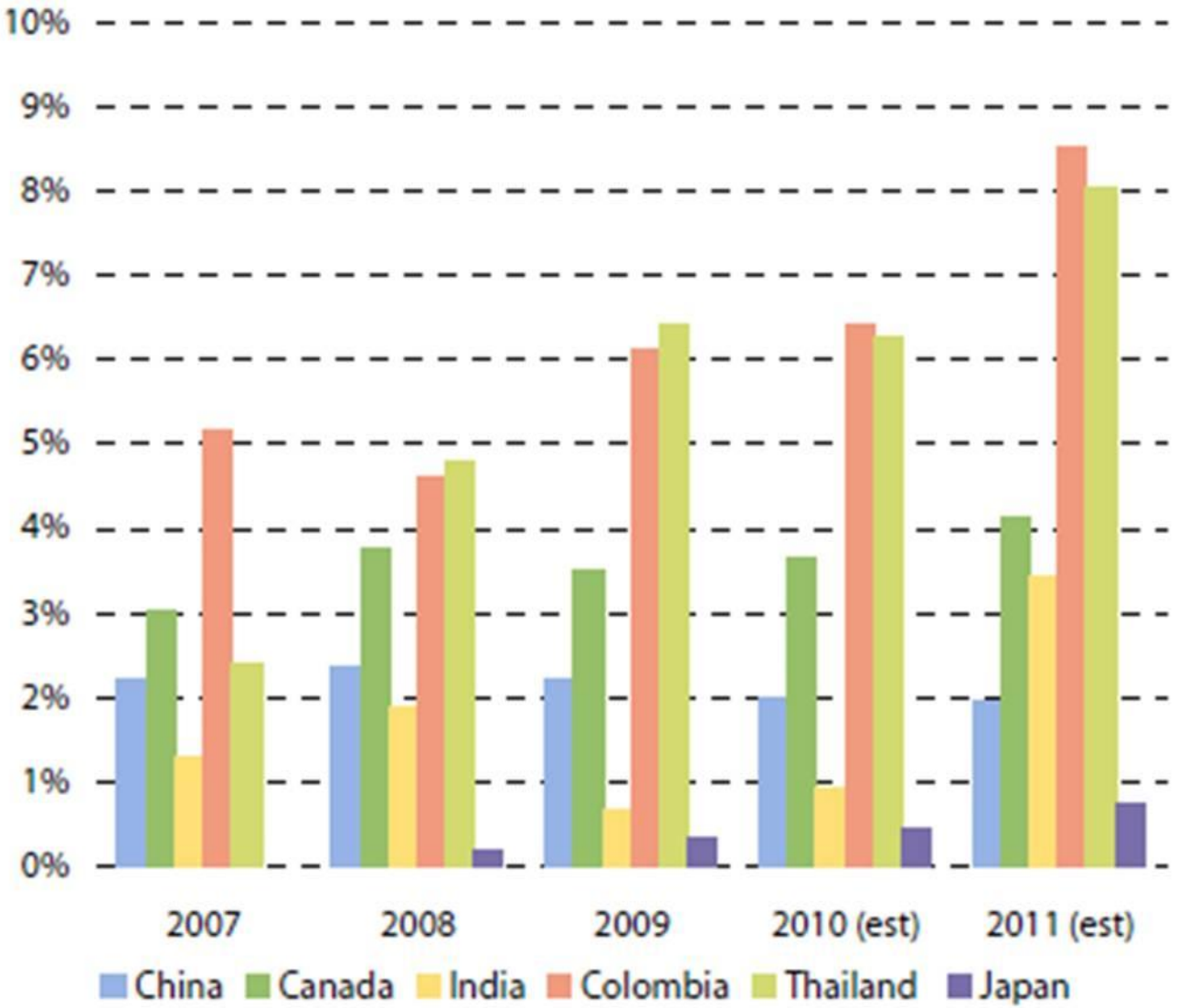
E. Union and Perspectives – Up to 2020 Production and Commercialization – Ethanol National Renewable Action Plans (EU 23)[1]



1. Belgium, Polony, Estonia and Hungary will show their plans

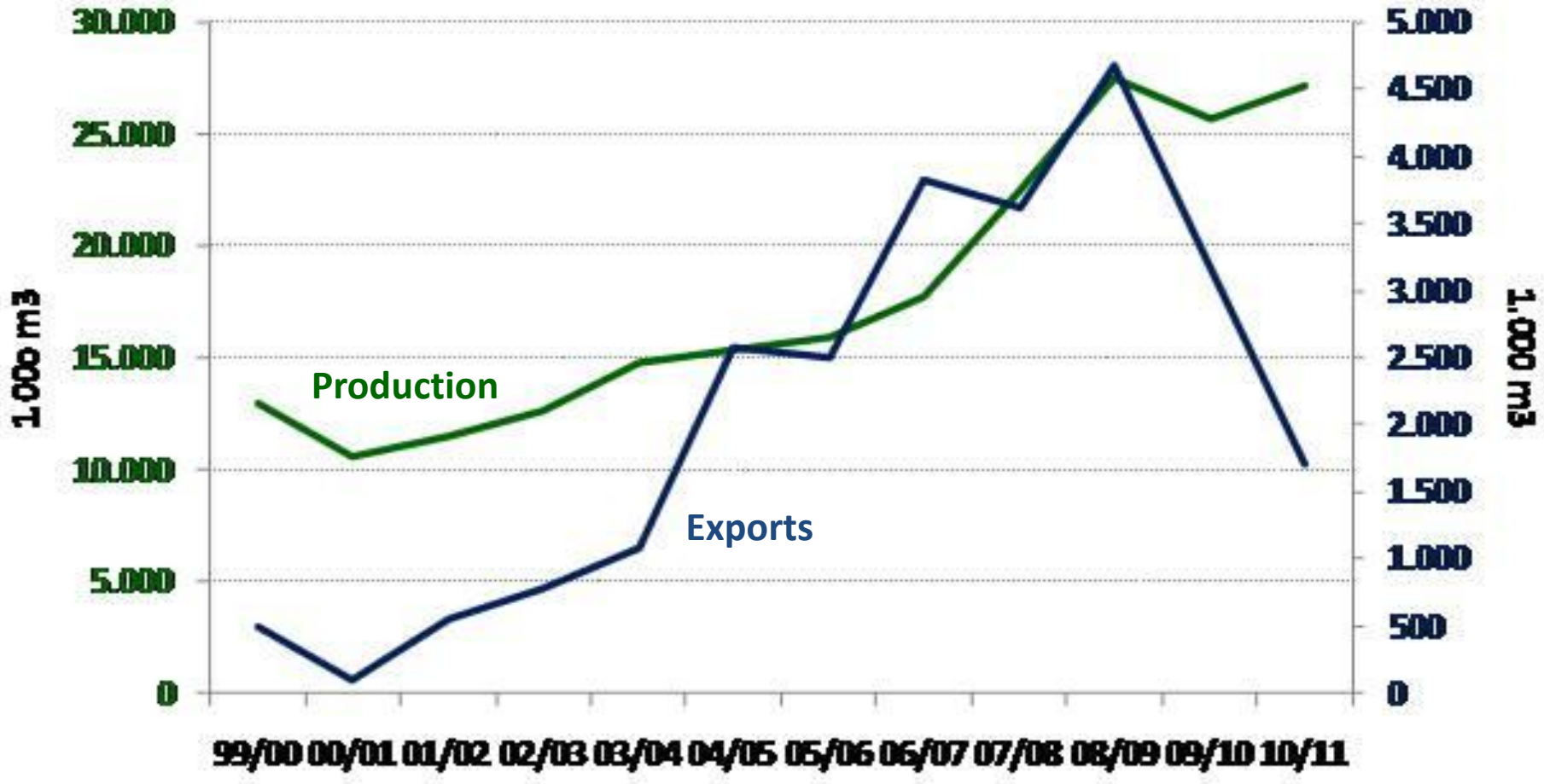
Source: NREAPs (EU 23), 2010, Elaboration - UNICA

OTHER IMPORTANT COUNTRIES
FUEL ETHANOL % GASOLINE CONSUMPTION
(BY VOLUME)



Source: LMC Internacional

Brazil: Ethanol Production and Exports

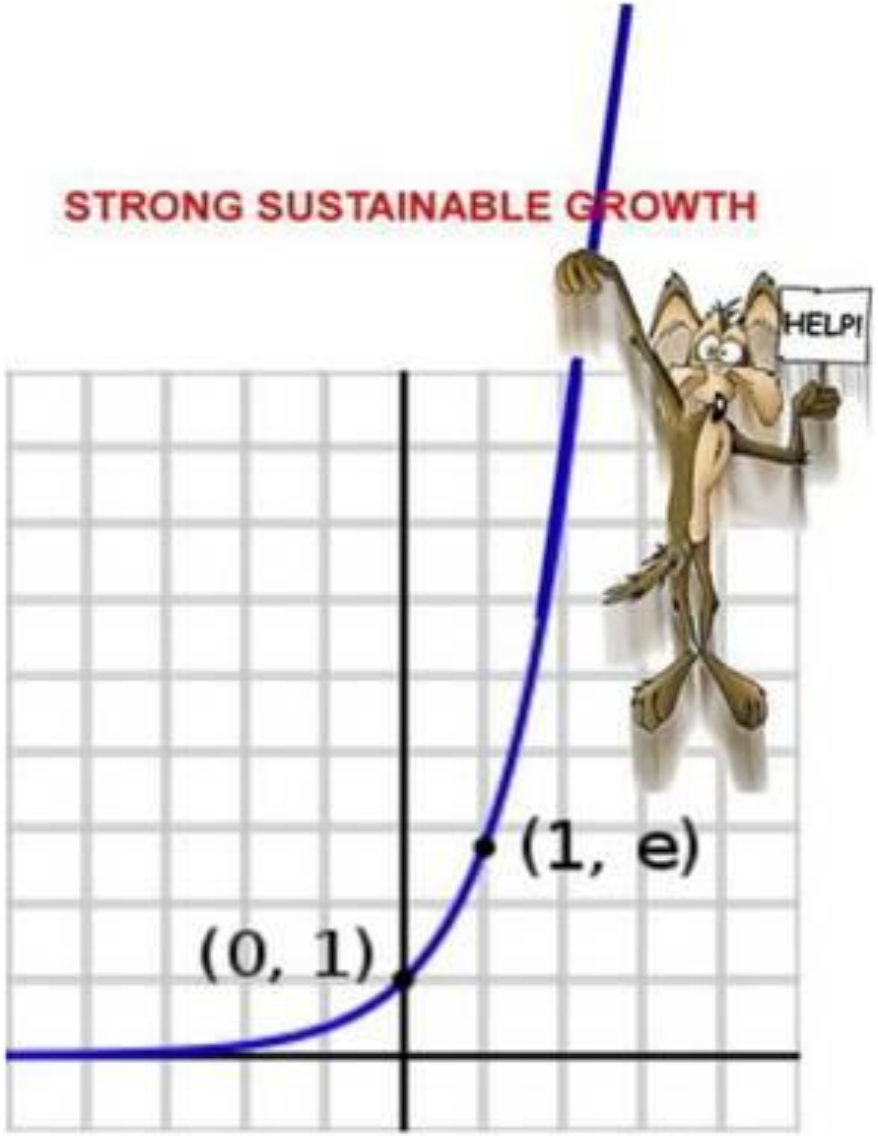


Source: UNICA and AliceWeb/MDIC, Elaboration Canaplan

BRAZIL:

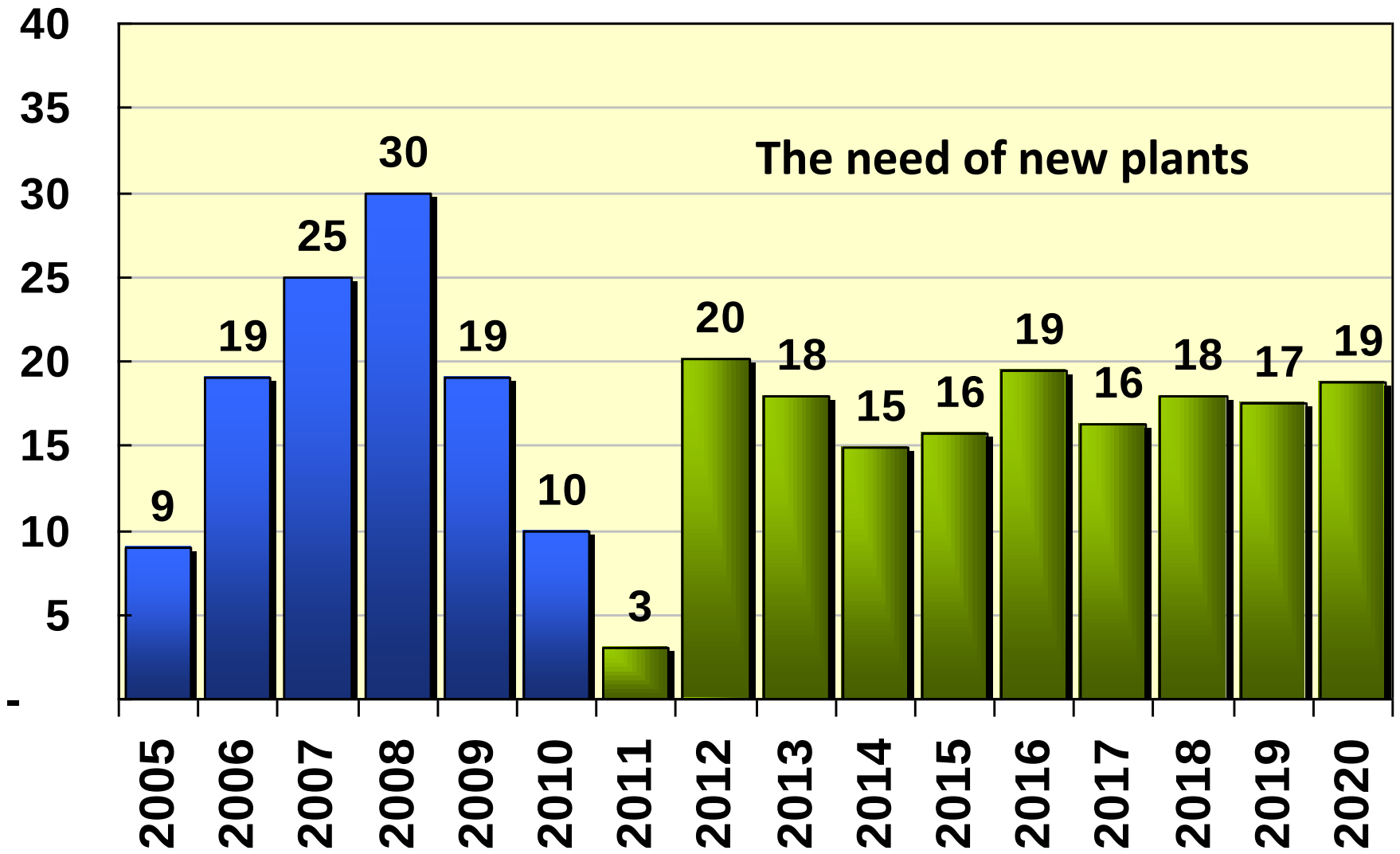
Extraordinary rise in ethanol demand by FFVs fleet;

Tight ethanol S & D balance by gasoline price´s policy; low investments > 2008; Old age of cane fields

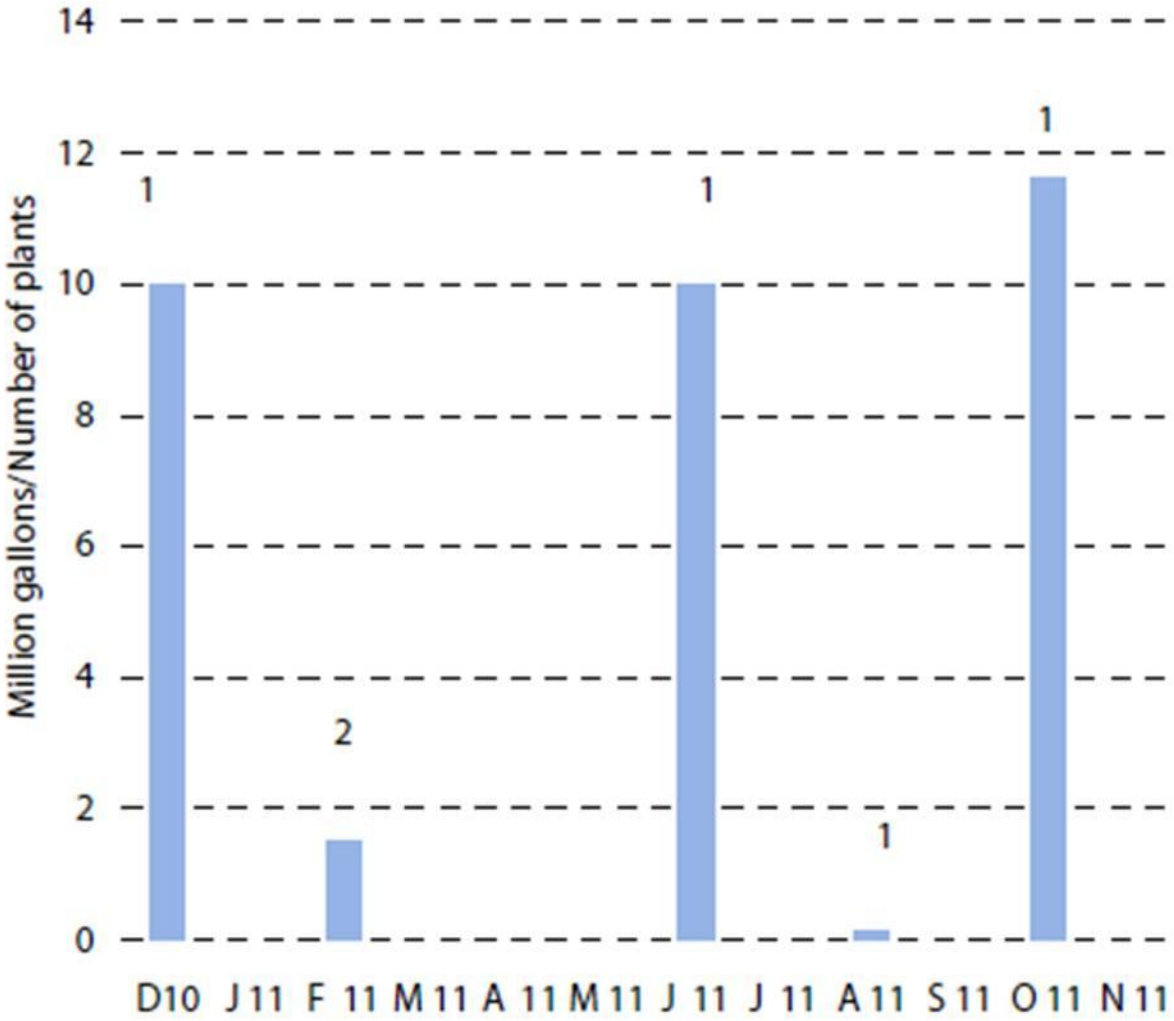


The greatest shortcoming of the human race is its inability to grasp the implications of the exponential function
Dr. Albert Bartlett

SUGARCANE AGRIBUSINESS IN BRAZIL..
LAST 5 YEARS AND POTENTIAL DEMAND



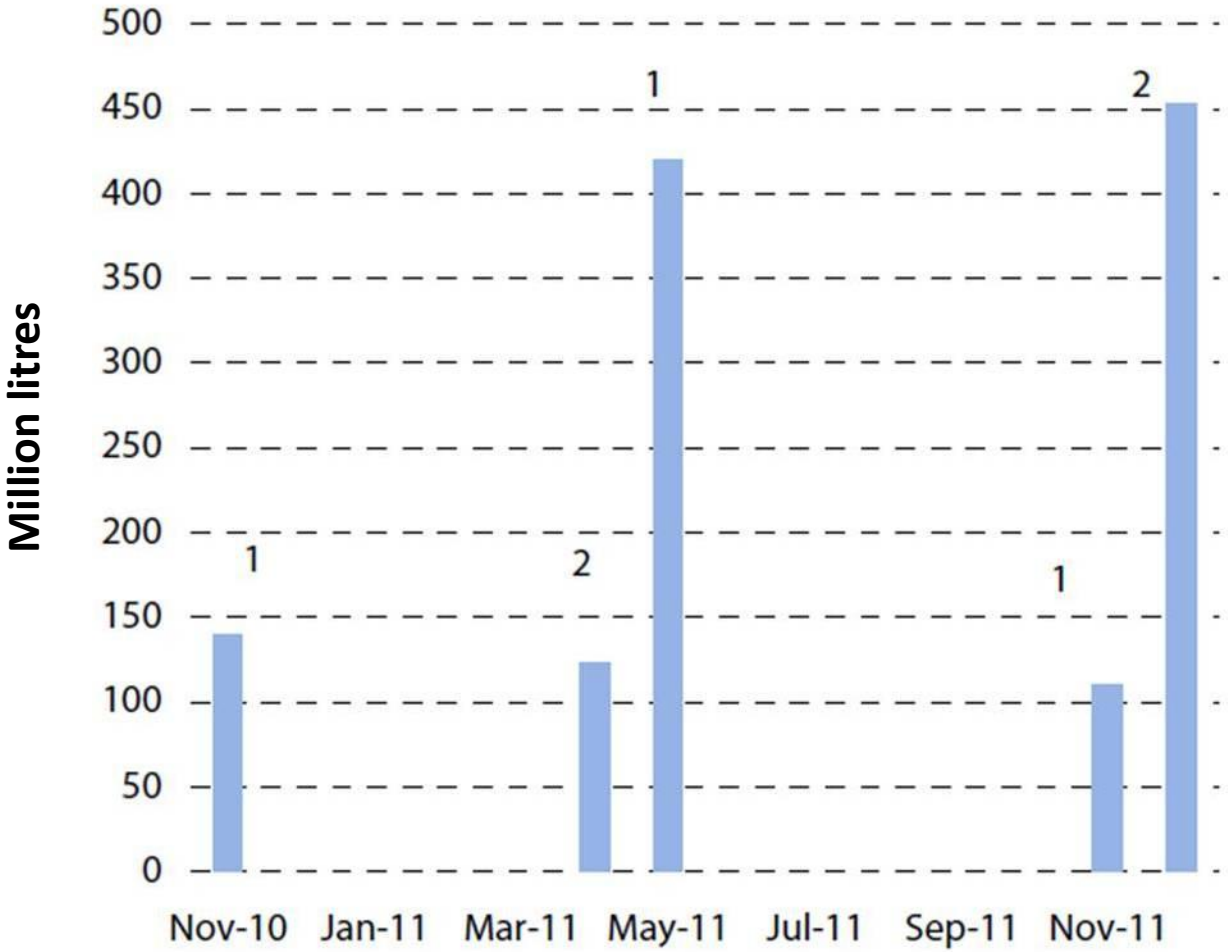
USA AND NEW PLANTS



Source: LMC International

E.U.

Production capacity of new plants



Source: LMC International.

What will stimulate commerce ?

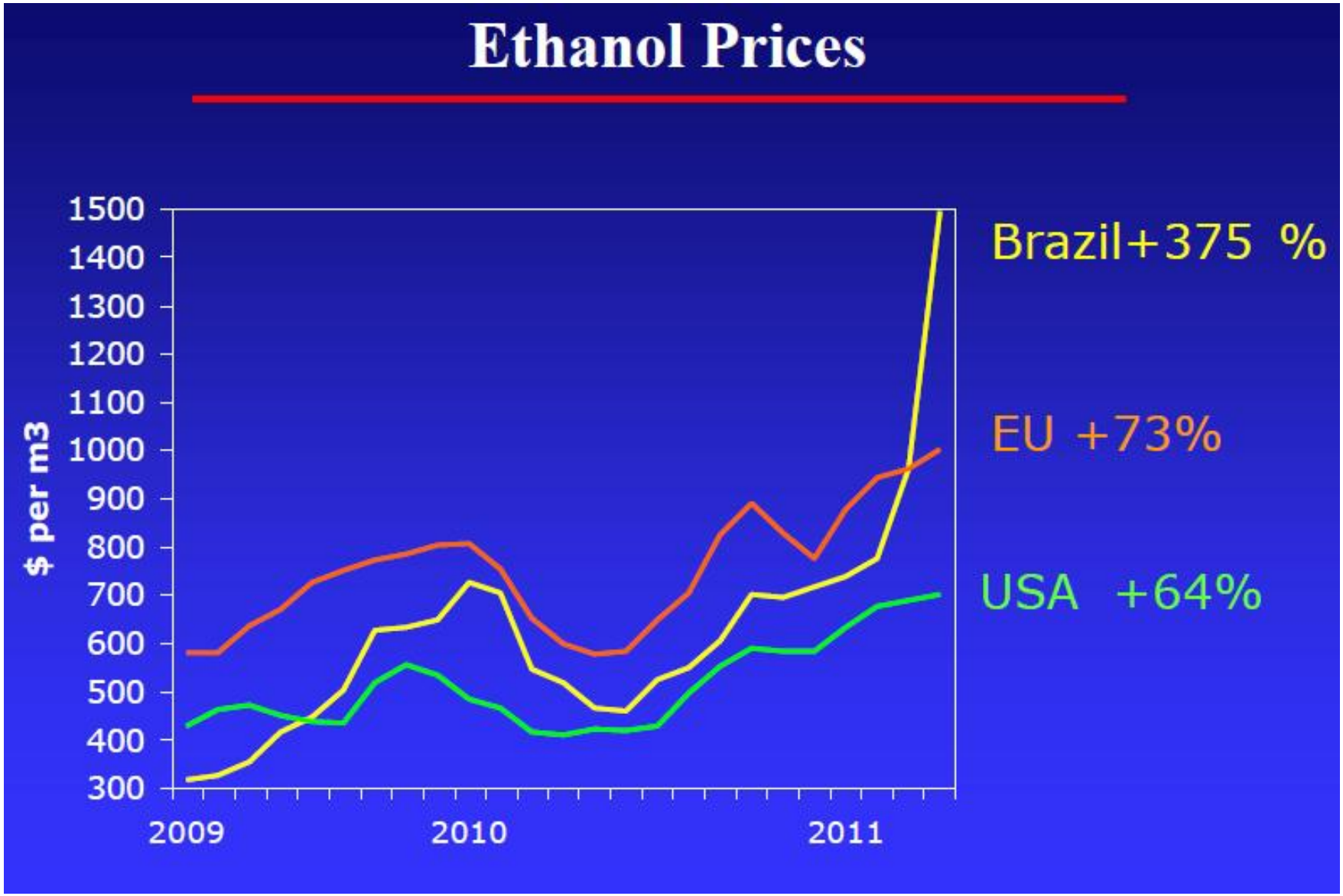
- ***Premium for sustainability (USA - RFS Advanced Biofuel & California LSCF as examples) as an important support for biofuels***

- ***Prices:***

  Consequences of underinvestments in the EU

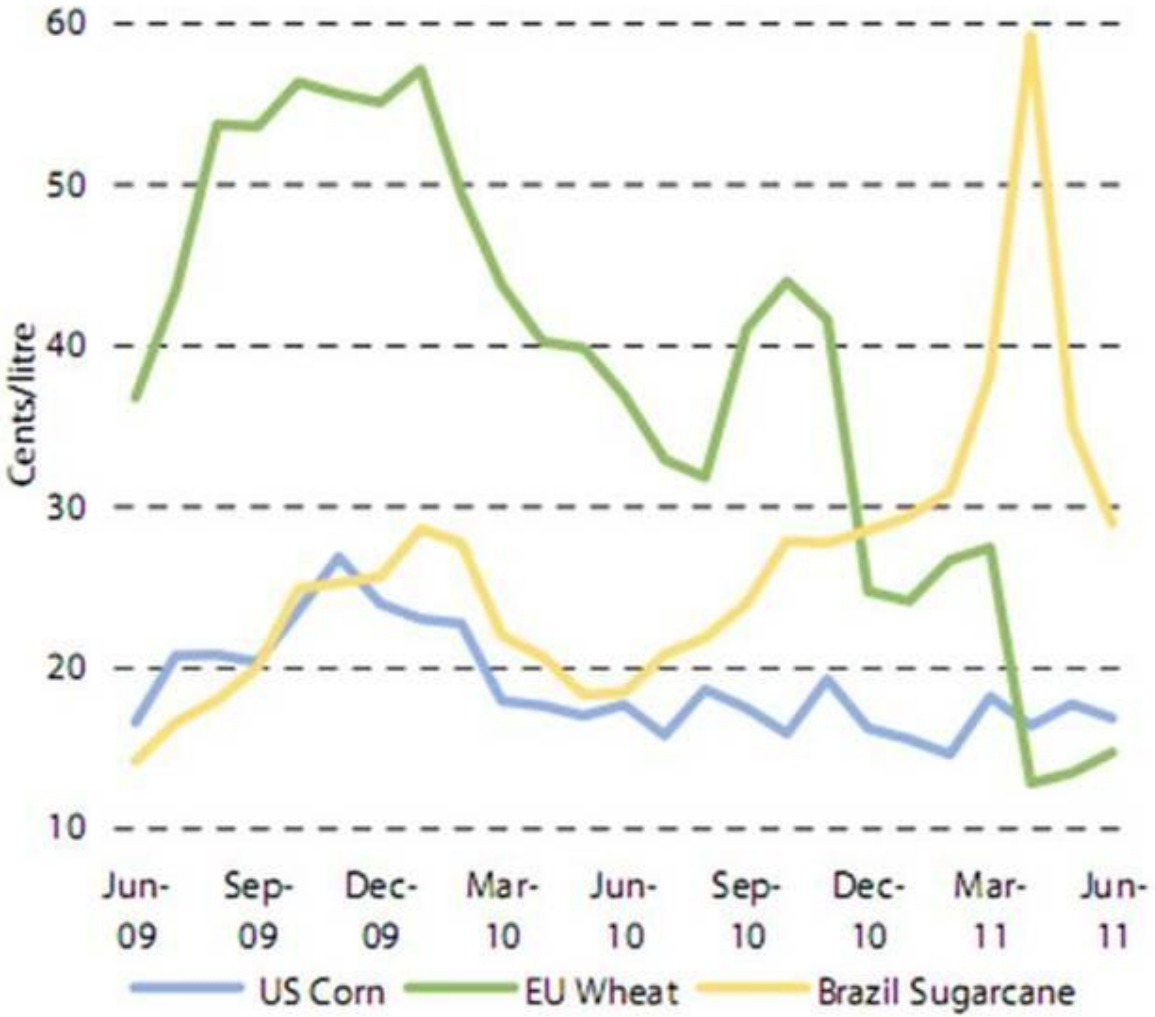
  Limited supply of raw material in Asia

  Mandate in USA and corn limits



Christoph Berg-FO Licht

ETHANOL PROCESSING MARGINS



Source: LMC Ethanol Quartely – Second Quarter 2011.

WE ARE LIVING NEW PARADIGMS

BRAZIL AND THE NEW LOGISTIC IN CONSTRUCTION FOR SUGAR AND ETHANOL: AN INVITATION TO FUTURE NEW GREENFIELDS.....

- PIPELINE
- RAILROAD
- HYDROWAY

NEXT STEPS FOR NEXT-GEN

CHALLENGES TO BIOFUELS –BRAZIL

- **ETHANOL/COGENERATION:**
  - **Return to investments cycle in production, balancing the cane fields, reducing seasonality and ethanol prices volatility, for a supply commitment.**
  - **To expand R&D increasing agro-industry efficiency, with important consequences as costs reduction.**
  - **To expand bioelectricity use, via regulation through auctions realized by region and source.**
- **BIODIESEL:**
  - **Raw material diversification, reducing vulnerability .**
  - **To reduce costs.**
  - **To finish with biodiesel auctions permitting a direct negotiations between producers and distributors.**

Source: Adaptado de Adriano Pires, 10° Congresso Abag, 08/08/11


OBRIGADO!
caio@canaplan.com.br
BIOFUELS AT CROSSROAD