

Ethanol Summit 2013

European Biofuels Legislation: Complexities and Challenges

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The Context

- The EU has taken very important decisions on its biofuels policy
 - Food crops (oilseeds, starch rich and sugar) => conventional, high-ILUC risks
 - 6.5% cap of the final energy consumption in transport by 2020
 - Non food crops will be encouraged => advanced, low-ILUC risks
 - Residues, co-products
 - What about food crops with low-ILUC risks? Shouldn't their production be stimulated?
- Models have been improving and results are converging
 - Sugarcane ethanol ILUC
 - 1 ha expansion => 0.2 to 0.24 ha ILUC
 - ILUC ha / 1000 liters of ethanol => 0.23 to 0.38
 - ILUC factors: 4 to 13 gCO₂/MJ
 - Although there still are major technical issues to be tackled

The Context

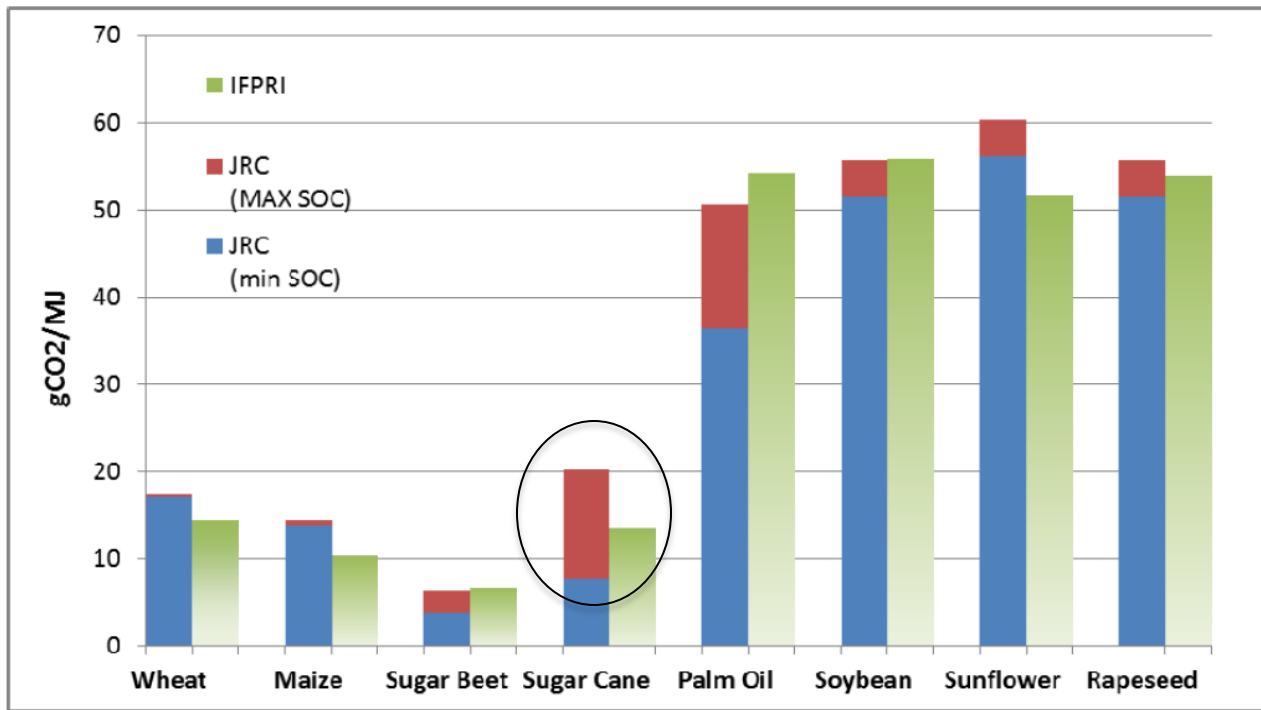


Figure 2: Comparison of total GHG emissions calculated with JRC-SAM and IFPRI methodology for the different feedstocks

Source: Marelli, L.; Ramos, F.; Hiederer, R.; Koeble, R. (2011) Estimate of GHG emissions from global land use change scenarios. JRC Technical Notes. EUR 24817 EN - 2011

- A very conservative approach for some feedstocks was taken

Feedstock'	ILUC emissions gCO ₂ /MJ (IFPRI, 2011)	Direct emissions savings gCO ₂ /MJ
Sugarcane (IFPRI)	13	-70%
Sugarcane (JRC)	7.7 – 20.3	-70%

Source: Laborde, D. 2011. Assessing the Land Use Change Consequences of European Biofuel Policies: Final Report. ATLASS Consortium.

- EPA: 4.1 gCO₂/MJ => sugarcane ethanol is advanced
- CARB: 71% reduction LUC in hectares => 13.3 gCO₂/MJ

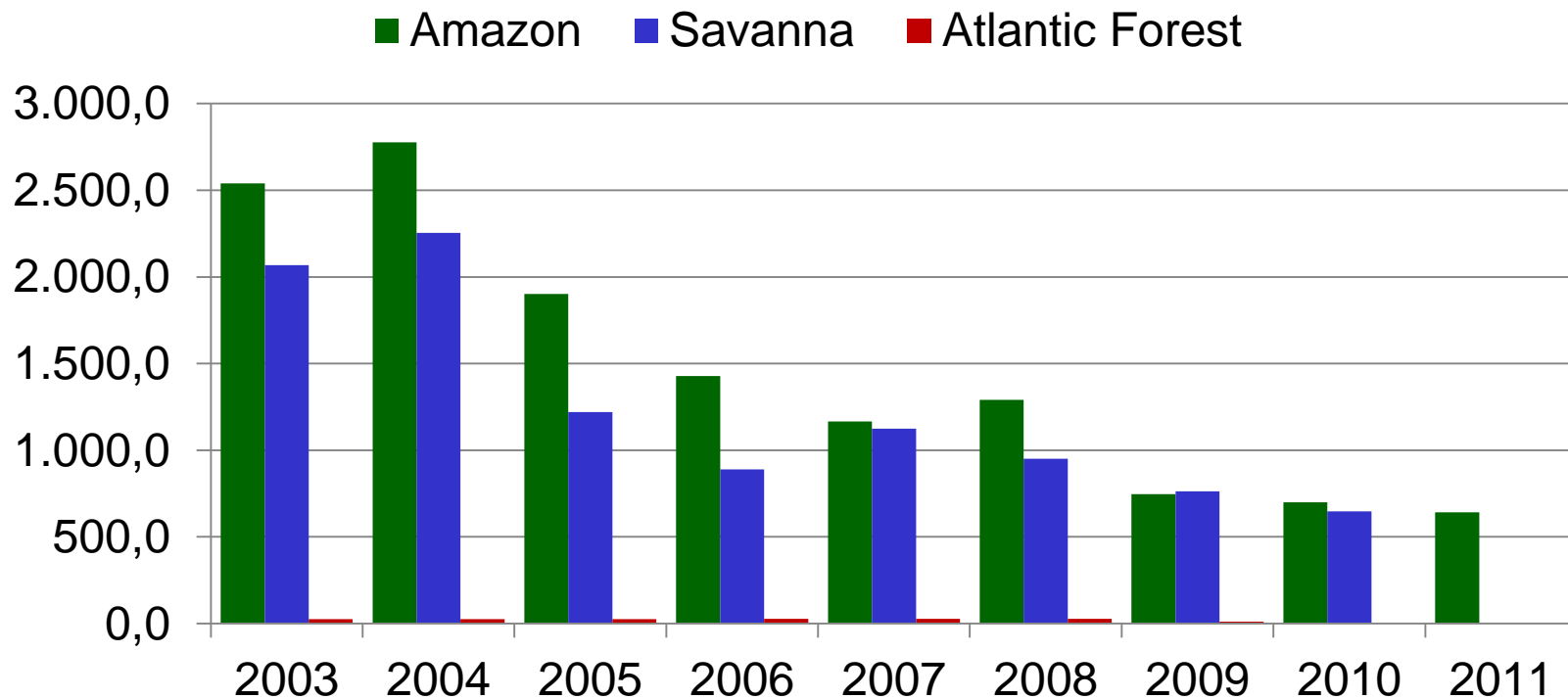
My objective

- Make you understand, based on evidences, that
 - Sugarcane ethanol produced in Brazil is a low-ILUC feedstock, it is energy efficient and it also uses residues
 - Being a food crop as well as a low-ILUC risk crop, there should be an intermediary category between conventional and advanced biofuels
 - Wishful thinking?
- 3 sets of evidences

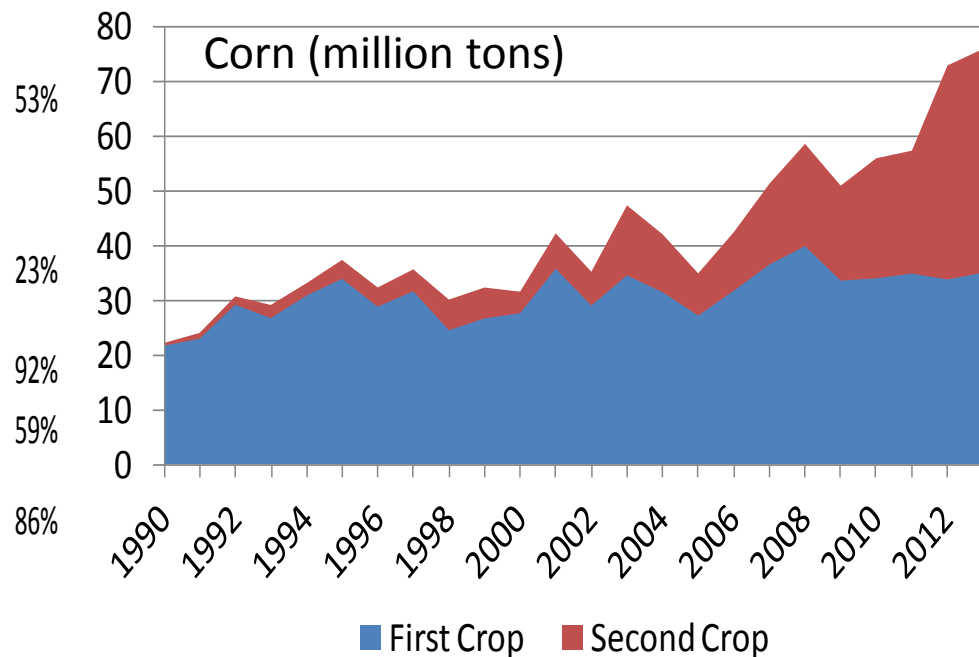
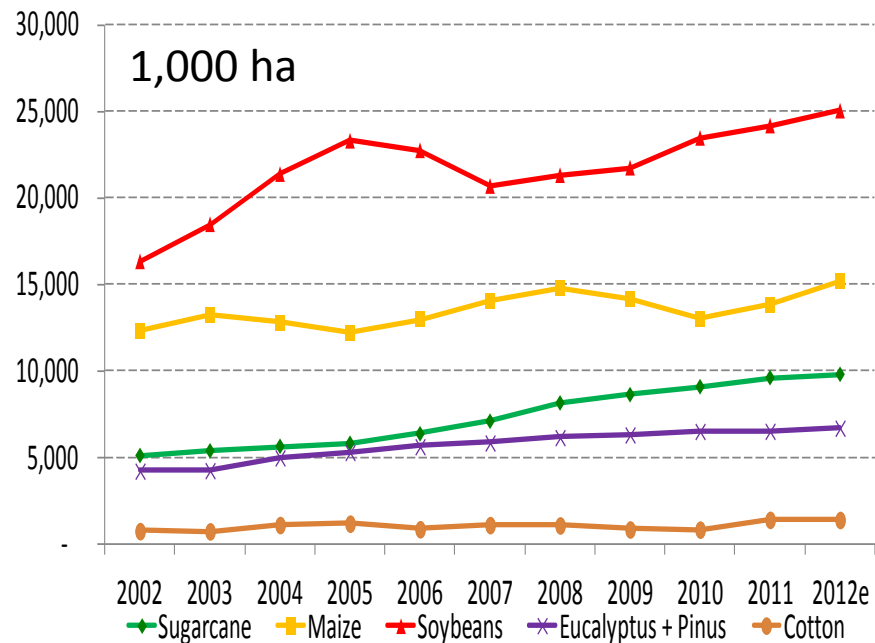
Evidence 1. Intensification and efficiency gains in the Brazilian agriculture

- Brazil has a unique combination of:
 - Availability of land for sugarcane not occupied with native vegetation => pastures
 - Large amount of protected native vegetation
 - Agricultural sector with high productivity levels
 - Strong conservation laws based on “control-command” enforcement
- Name a country: I bet you can list other countries with this combination
 - One factor, at least, is always missing

Evidence 1. Deforestation is Dropping (1,000 hectares)

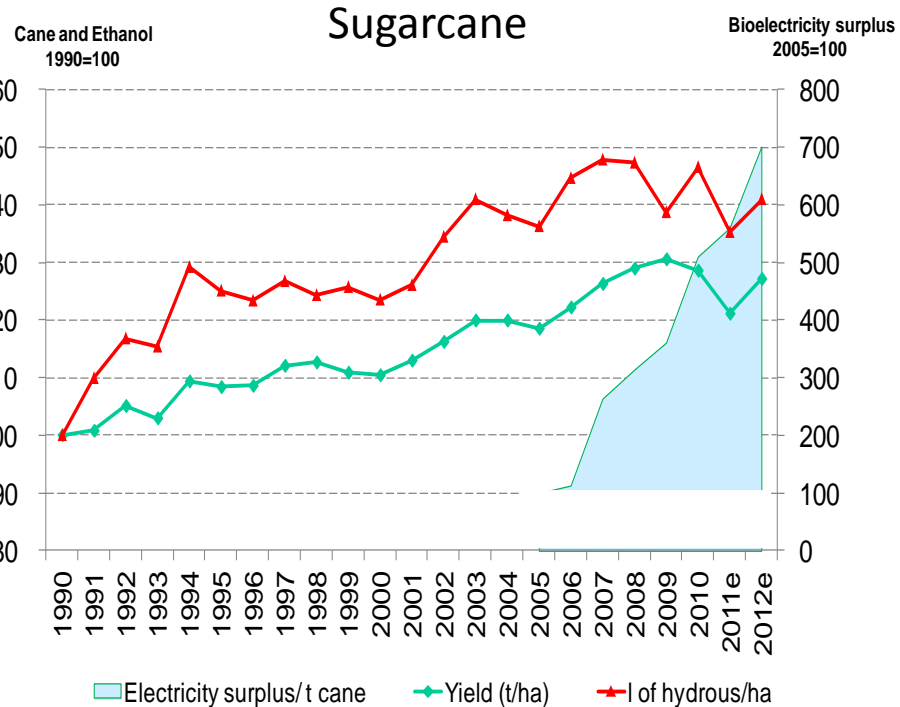
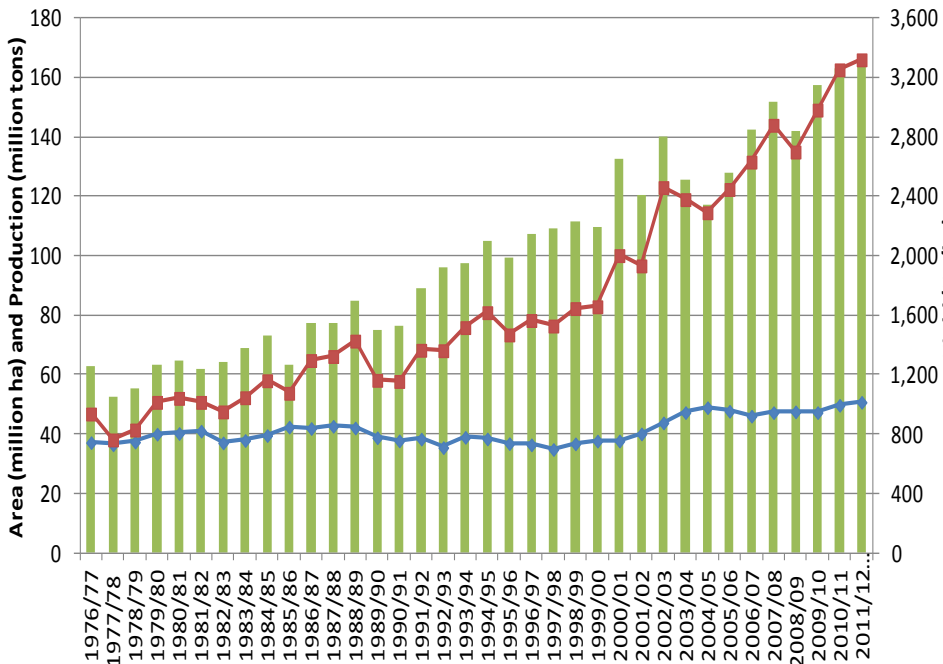


Evidence 1. Simultaneous expansion of ethanol and major crops

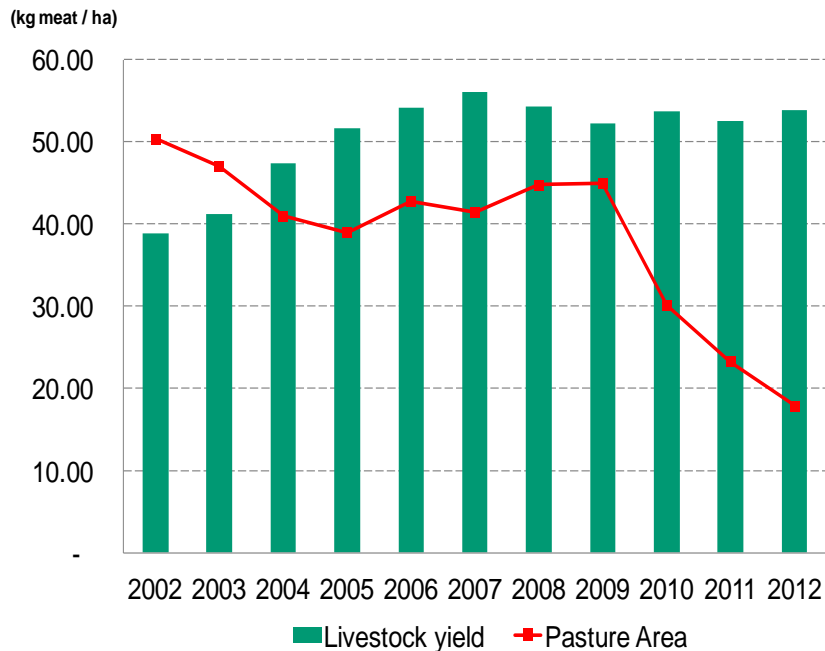


Evidence 1. Yield Improvement 1

Grains ■ Yield ◆ Area ■ Production



Evidence 1. Yield Improvement 2

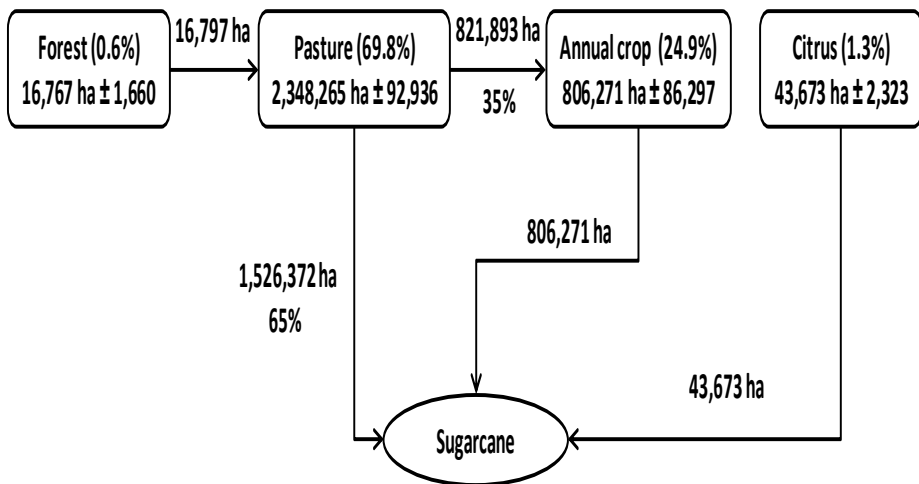


	2002	2012	Variation	CAGR (%)
Pasture area (1000 ha)	184,037	180,785	-3,252	-0.14%
Herd (1000 Head)	185,349	213,239	27,890	0.98%
Meat production (1000 MT)	7,139	9,748	2,609	2.64%
Livestock yield (kg of meat/ha)	39	54	15	2.78%
Milk production (1000 liters)	24,172	33,996	9,824	3.6%
Milk production per cow (liters/cow)	1,286	1,479	193	1.4%

Evidence 2. No DLUC and Intercropping

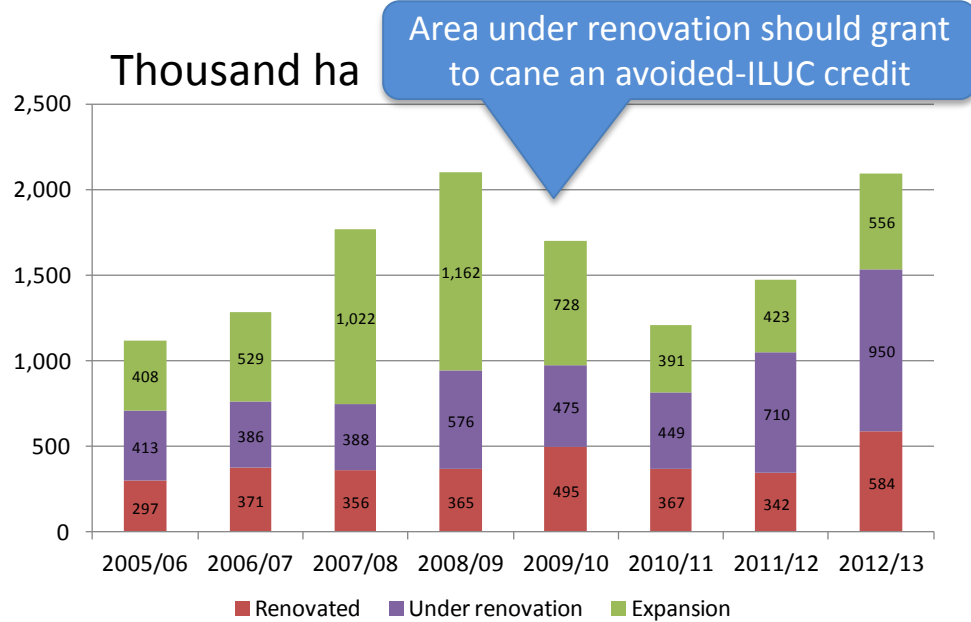
- Regardless the land availability, sugarcane expansion dynamic has been pasture-based

- Each hectare of cane can bring together 1/6 hectare of food production (intercropping)



Expansion (2005-09): 3.2 million ha

Source: Adami, M.; Rudorff, B. F. T.; Freitas, R. M.; Aguiar, D. A.; Sugawara, L. M.; Mello, M. P. (2012). Remote Sensing Time Series to Evaluate Direct Land Use Change of Recent Expanded Sugarcane Crop in Brazil. Sustainability 2012, 4, 574-585 (doi:10.3390/su4040574).



Source: Canasata/INPE

Evidence 3. Cane ethanol: no competition with food, either sugar or other crops

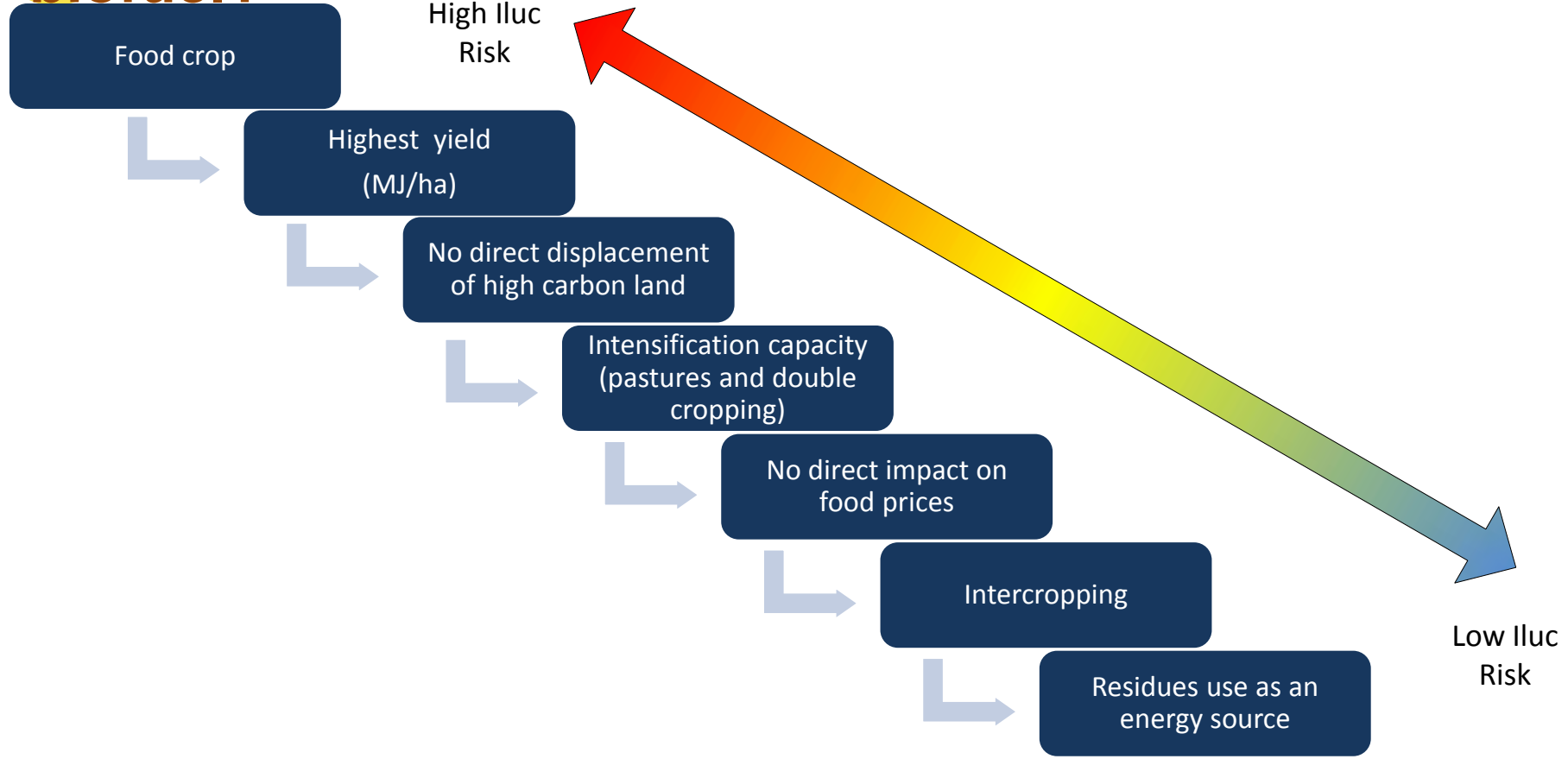
Argument on sugar:

- Sugar market has supported ethanol expansion in Brazil
- Without sugar, ethanol would not be produced competitively
- If the supply of sugarcane is short, adjustments in the demand occur in the ethanol market rather than in the sugar market
- Sugar and ethanol share industrial and logistics costs: cane transportation, crushing and juice treatment and concentration
- Synergies, such as the cogeneration system: due to the large capacity on sugarcane crushing, boilers also need to have large capacity to process the bagasse

Argument on no land competition:

- Expansion over pastures, pastures is intensifying
- Cane area under renovation

Conclusion: why cane ethanol is a low-ILUC biofuel?





Thank you

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