



***Public policies and global
development of biofuels:
challenges and opportunities***

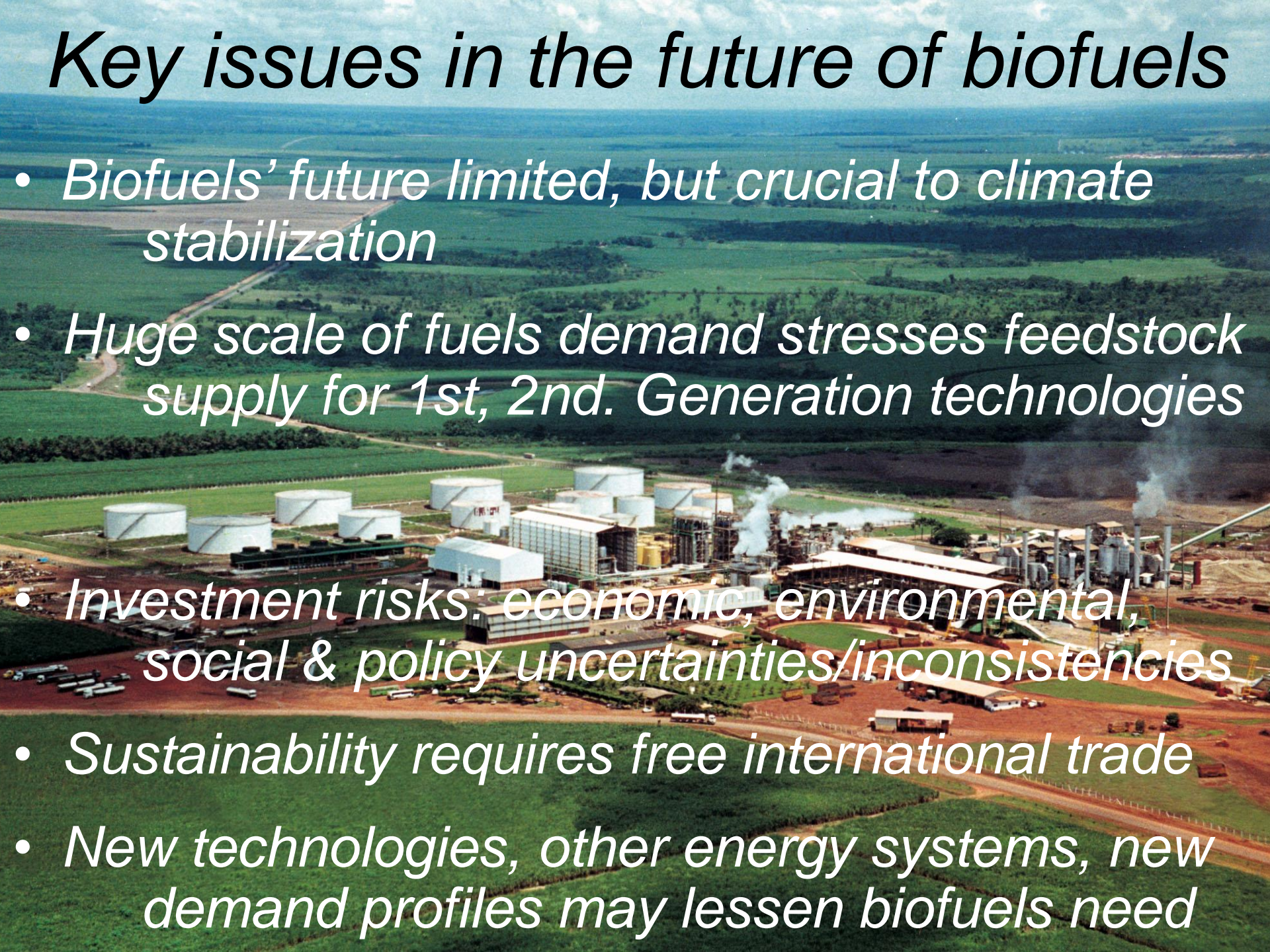
Sergio C. Trindade
strindade@alum.mit.edu

6 E 7 DE JUNHO DE 2011 - HOTEL GRAND HYATT SÃO PAULO

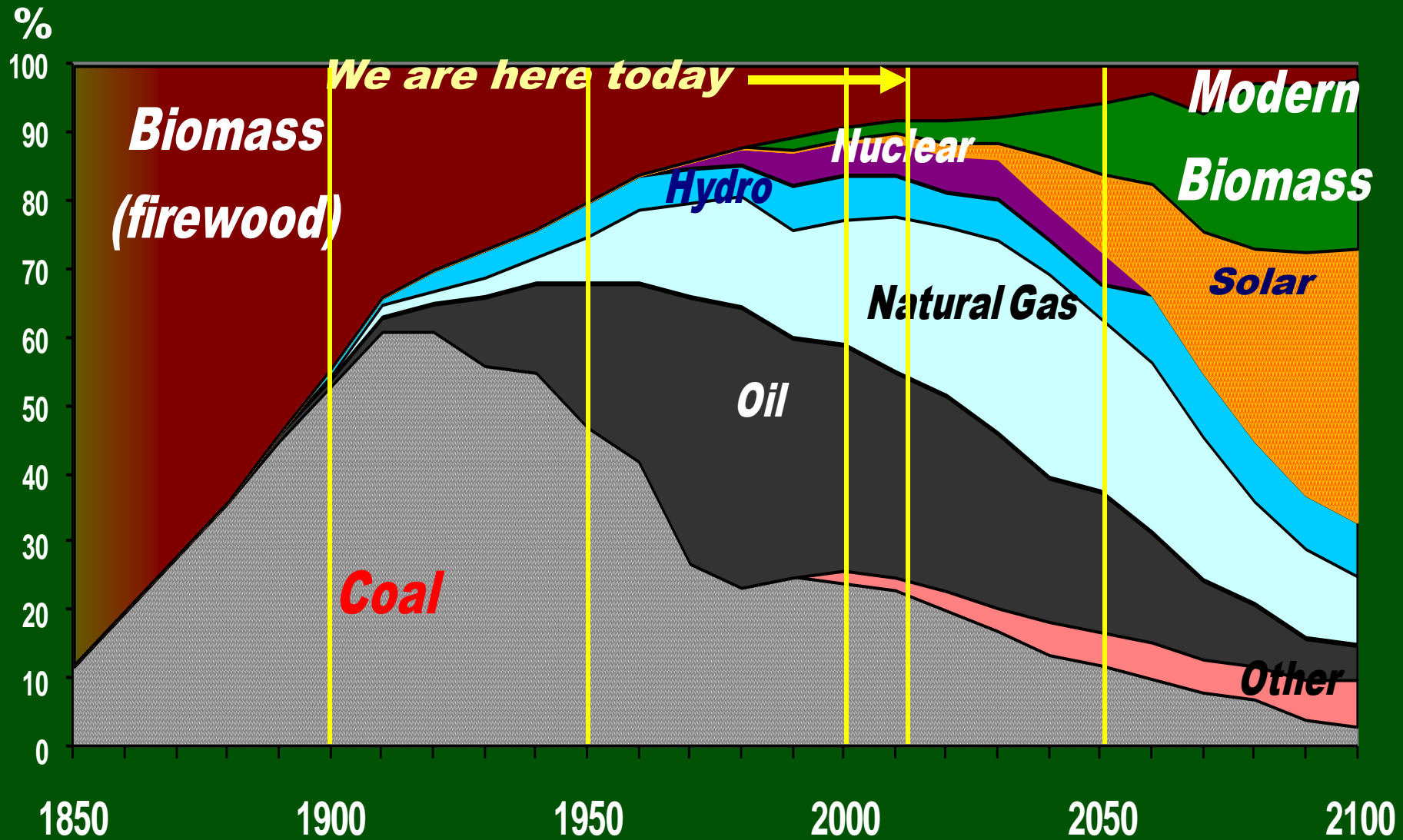
WWW.ETHANOLSUMMIT.COM.BR

Key issues in the future of biofuels

- Biofuels' future limited, but crucial to climate stabilization*
- Huge scale of fuels demand stresses feedstock supply for 1st, 2nd. Generation technologies*
- Investment risks: economic, environmental, social & policy uncertainties/inconsistencies*
- Sustainability requires free international trade*
- New technologies, other energy systems, new demand profiles may lessen biofuels need*



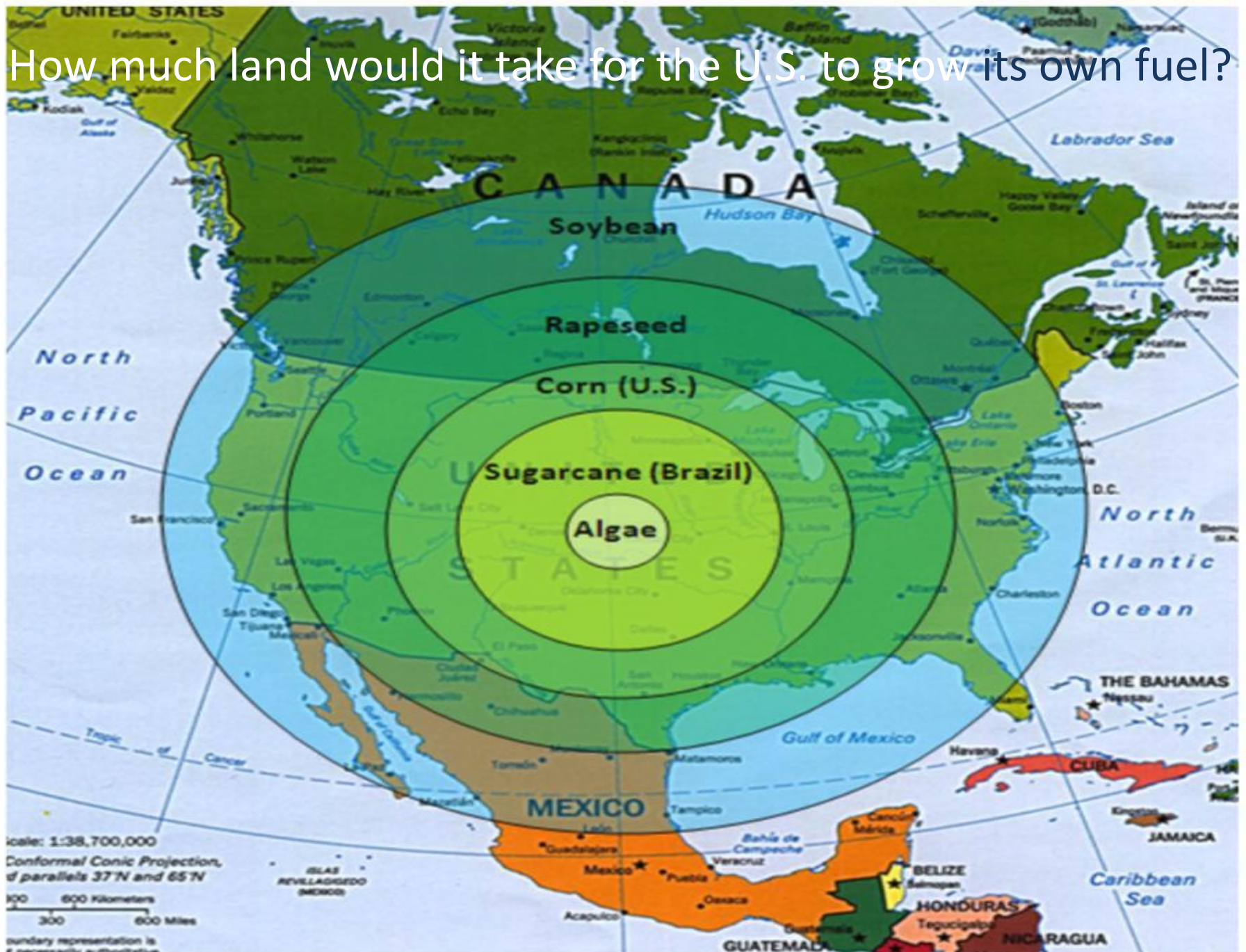
The Beginning of a New Era



Liquid Biofuels Issues

- *Scale: 2010 fuel ethanol/biodiesel only about 3% of oil! 27% in 2050*
- *Land, water, labor, financing, market, and policy uncertainties*
- *Local environmental issues*
- *GHG emissions*

How much land would it take for the U.S. to grow its own fuel?



Source: Santana, G. and S. Quirk (2009). *Growing Green: An In-Depth Look at the Emerging Algae Industry*, Greener Dawn Research, 22 July, 16p.

Liquid Biofuels Issues

- *Food versus fuels*
- *Access to raw materials*
- *1st., 2nd technological generations*
- *Sustainability and certification*
- *International trade: Doha impasse, biofuels as environmental goods and services*
- *But, BP, Shell, Exxon, others, interested*

Source: Trindade, Sergio C. (2010). *International Biofuels Trade: Issues and Options*. International Biofuels Conference, São Paulo, 26-28 May.

Photo "Vinhaça" by Ismar Geraldo B. de Almeida

World Fuel Ethanol

- *Markets driven by mandates, subsidies*
- *Brazil: dominant exporter, domestic demand, sugar arbitrage*
- *Trade barriers everywhere: tariff and non-tariff*
- *US corn-based ethanol: sustainability, food vs fuel*
- *Need of well established futures and options markets for price discovery of fuel ethanol*
- *Sustainability certification: a two edge-sword*

World Fuel Ethanol

- *USA, Brazil, EU, India, China, Japan, Canada, Thailand, Colombia, Australia: significant domestic fuel ethanol markets, some will need imports*
- *A truly liberalized global market in fuel ethanol : a vision for the distant future*
- *Africa: the new frontier producer*
- *Competition: biodiesel, biomass-derived F-T, Amyris carbohydrates to hydrocarbons, sucro-chemicals, ethanol-chemicals*

Sustainability of biofuels needs freer international trade

- Large scale sustainable production and transport of biofuels fits tropical countries best, have comparative advantages*
- Temperate countries can enhance global sustainability by limiting production of unsustainable biofuels*
- They should import sustainable biofuels produced in tropical countries*
- A South-North BioPact is needed to promote global biofuels sustainability*

THANK YOU!

strindade@alum.mit.edu

United States Policies

Renewable Fuel Standard (2005; revised effective 2008)

- ***Consumption mandate, Feedstock requirements, Greenhouse gas reduction requirements***

California Low Carbon Fuel Standard (effective 2011)

- ***Carbon intensity reduction requirements***

Tax credits

- ***VEETC (blenders), Small producers, Cellulosic producers***

R&D grants and loans (biomass; processing)

- ***BCAP, BRDI***

Tariffs (WTO--1.9%, 2.5%; ODC—54 cents/gal. applicable to fuel use)

- ***CBI dehydration origin quota (7% of U.S. consumption)***
- ***Duty drawbacks (became more restrictive in 2008)***

Brazil Policies

- ***Mandated blend in gasoline (18-25%)***
- ***Mandated ethanol sales outlets (neat hydrous)***
- ***National Petroleum Agency (ANP) regulation of ethanol market (MP 532)***
- ***Sales tax incentive for flex-fuel vehicles (14% vs 16%)***
- ***Preferential tax treatment vs gasoline (CIDE, PIS/COFINS)***
- ***Project financing (BNDES; FINEM; BNDESPAR; FINAME)***
- ***Intercrop inventory financing***
- ***Irrigation financing (MODERINFRA)***
- ***R&D funding (CNPq; EMBRAPA; FINEP; FUNTEC; BNDES; MCT)***
- ***Tariff—20% ad valorem (currently suspended)***

European Union Policies

Renewable Energy Directive (June 2009)

- ***National Action Plans***
- ***Target of 10% renewable energy in transport sector by 2020 (energy basis)***
- ***Greenhouse gas emission reduction (35% in 2012; 50% in 2017; 60% in 2018 for new plants (>Jan. 1, 2017); grandfathering for old plants (<Jan. 23, 2008) until April 1, 2013)***
- ***Sustainability criteria, certification requirements (biodiversity, carbon stocks of concern; forests, grasslands, peatlands)***
- ***Indirect land use change effects still under consideration***

Fuel Quality Directive (April 2009)

- ***Low carbon fuel standard—reduce carbon intensity 6% by 2020***
- ***E10 phase-in***
- ***Coordinates with RED***

R&D funding (FP-7, CORDIS, SET-Plan, EIBI)

Tariffs

- ***Ethanol: undenatured—19.2 euros/hl; denatured—10.2 euros/hl***
- ***Fuel mixtures (HS ch. 38)—6.5% ad val.***
- ***ETBE—5.5% ad val.***

Acronyms

- *BCAPP* *Biomass Crop Assistance Program*
- *BRDI* *Biomass R&D Initiative*
- *CORDIS* *Community R&D Info Service for Science*
- *EIBI* *European Industrial Technology Initiative*
- *FP-7* *Seventh Framework Program*
- *ODC* *Other duties and charges*
- *RED* *Renewable Energy Directive*
- *SET-Plan* *Strategic Energy Technology Plan*
- *VEETEC* *Volumetric Ethanol Excise Tax Credit*