GLOBAL BIOECONOMY SUMMIT 2015

OECD Workshop: Bioeconomy Policy Analysis

Chair: **Peter Schintlmeister,** OECD

Enabling Food Security in the Southeast Asia : ASEAN Food Security Initiatives

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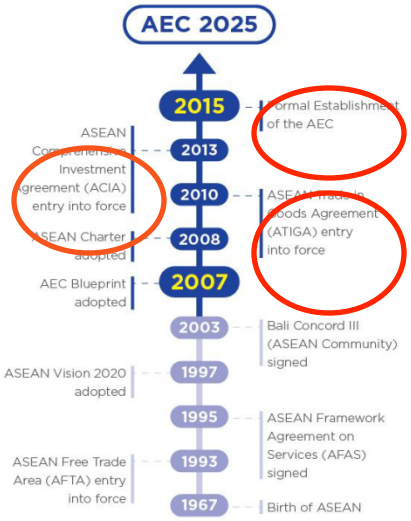
Presented at the Global Bioeconomy Summit 2015, 25-26 November 2015, Berlin, Germany

ASEAN
Economic Community at a Glance

one vision
one identity
one community

AEC Timeline



ASEAN Economy

Between 2007 and 2014, ASEAN GDP **nearly doubled**, while current GDP per capita **increased by 76%**

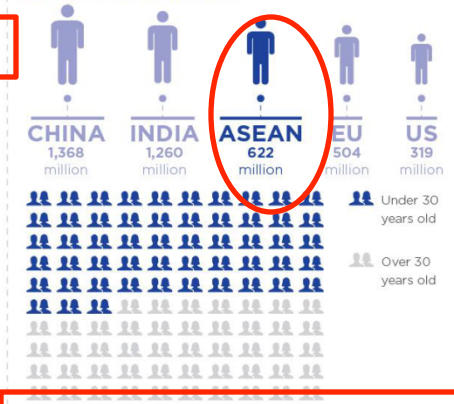
In 2014, ASEAN economy was

the **7th largest in the world** & the **3rd largest in Asia**

Source : ASEAN Secretariat

ASEAN Population

In 2014, ASEAN population was the **3rd largest in the world**



Over half of ASEAN population were **below 30 years of age** in 2014, as compared to 39% of East Asian and 34% of European.

Source : ASEAN Secretariat; UN Population Division - World Population Prospect, 2015 Rev

The Association of Southeast Asian Nations (ASEAN) was established on 8 August 1967. The Member States of the Association are Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam. The ASEAN Secretariat is based in Jakarta, Indonesia.

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Catalogue-in-Publication Data
ASEAN Economic Community At A Glance 2007-2014
Jakarta: ASEAN Secretariat, November 2015
337.159
1. ASEAN – Economic Integration - Economy
2. Population – Trade – Investment

ASEAN: A Community of Opportunities
General information on ASEAN appears online at the ASEAN Website: www.asean.org

ASEAN
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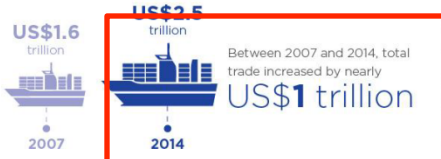
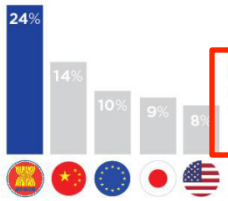
ASEAN Trade

Total ASEAN Trade



Between 2007 and 2014, total trade increased by nearly **US$1 trillion**

Major Trading Partners



Intra-ASEAN trade comprised **the largest share** of ASEAN's total trade by partner in 2014

Source : ASEAN Secretariat

ASEAN FDI

With **US$24 billion**, **Intra-ASEAN** was the **2nd highest source** of FDI in 2014

Source : ASEAN Secretariat

ASEAN Connectivity

Annual tourist arrivals were up from **62 million** in 2007 to **105 million** in 2014, **almost half** of which were **intra-ASEAN**

The rate of Internet subscription **more than doubled** from **11.8** per 100 inhabitants in 2007 to **28.6** in 2014

Source : ASEAN Secretariat; UN Millennium Development Goals, 2015

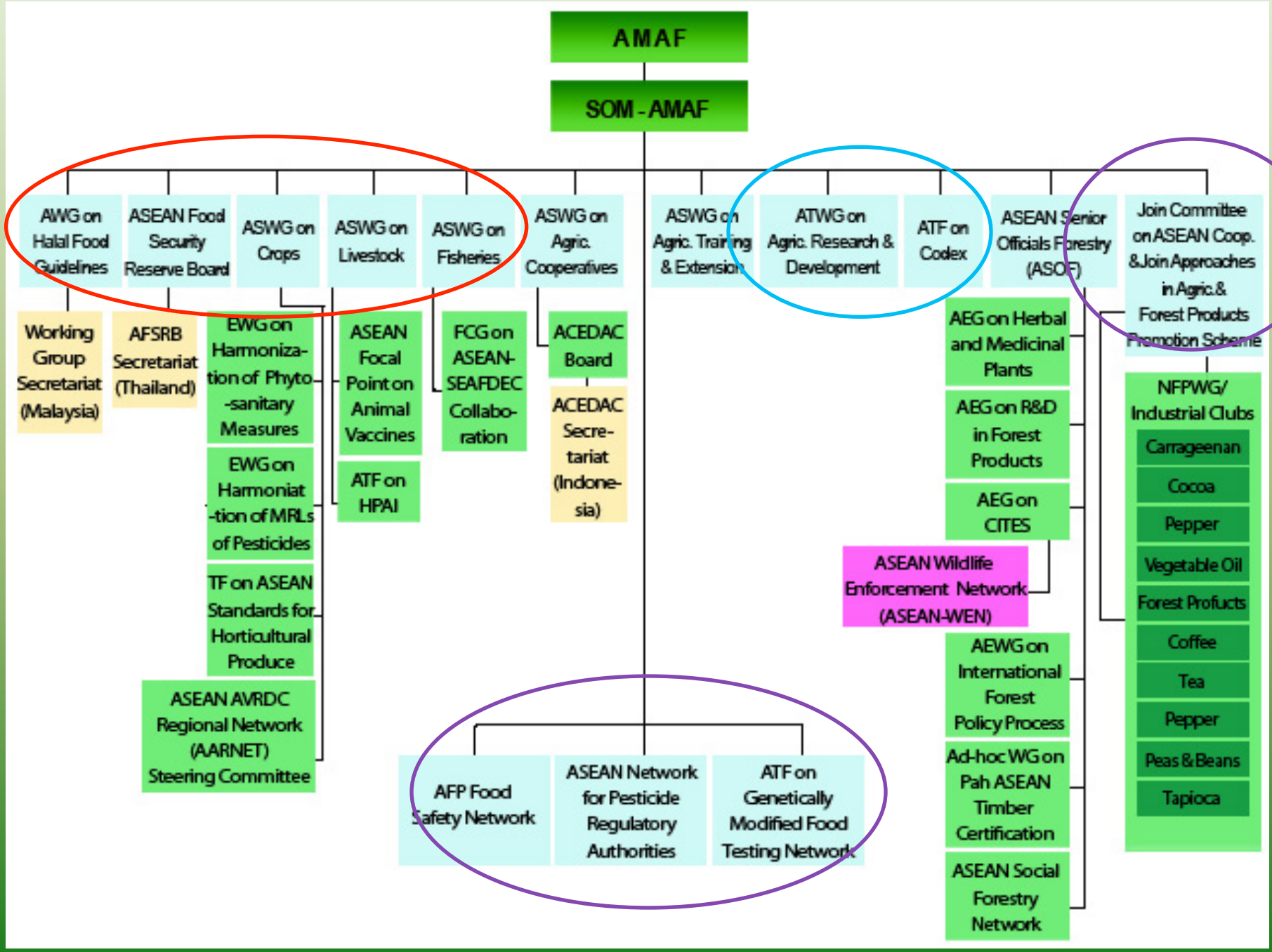
This leaflet is supported by the European Union through the EU - ASEAN COMPASS.

Association of Southeast Asian Nations - ASEAN

ASEAN 10 Member States (AMS):
BRU, CAM, IND, LAO,MAL,MYN,PHI,SIN,THA, VIE

ASEAN Dialogue Partners :

- ASEAN + 3 (China, Japan, Republic of Korea)
- ASEAN - Australia
- ASEAN - India
- ASEAN – EU
- ASEAN – Russia
- ASEAN - US


AMAF
SOM - AMAF
AWG on Halal Food Guidelines
ASEAN Food Security Reserve Board
ASWG on Crops
ASWG on Livestock
ASWG on Fisheries
ASWG on Agric. Cooperatives
ASWG on Agric. Training & Extension
ATWG on Agric. Research & Development
ATF on Codex
ASEAN Senior Officials Forestry (ASOF)
Join Committee on ASEAN Coop. &Join Approaches in Agric.& Forest Products Promotion Scheme
Working Group Secretariat (Malaysia)
AFSRB Secretariat (Thailand)
EWG on Harmoniza-tion of Phyto--sanitary Measures
EWG on Harmoniat -tion of MRLs of Pesticides
TF on ASEAN Standards for Horticultural Produce
ASEAN AVRDC Regional Network (AARNET) Steering Committee
ASEAN Focal Point on Animal Vaccines
ATF on HPAI
FCG on ASEAN-SEAFDEC Collabo-ration
ACEDAC Board
ACEDAC Secre-tariat (Indone-sia)
AEG on Herbal and Medicinal Plants
AEG on R&D in Forest Products
AEG on CITES
ASEAN Wildlife Enforcement Network (ASEAN-WEN)
AEWG on International Forest Policy Process
Ad-hoc WG on Pah ASEAN Timber Certification
ASEAN Social Forestry Network
NFPWG/ Industrial Clubs
Carrageenan
Cocoa
Pepper
Vegetable Oil
Forest Profucts
Coffee
Tea
Pepper
Peas & Beans
Tapioca
AFP Food Safety Network
ASEAN Network for Pesticide Regulatory Authorities
ATF on Genetically Modified Food Testing Network

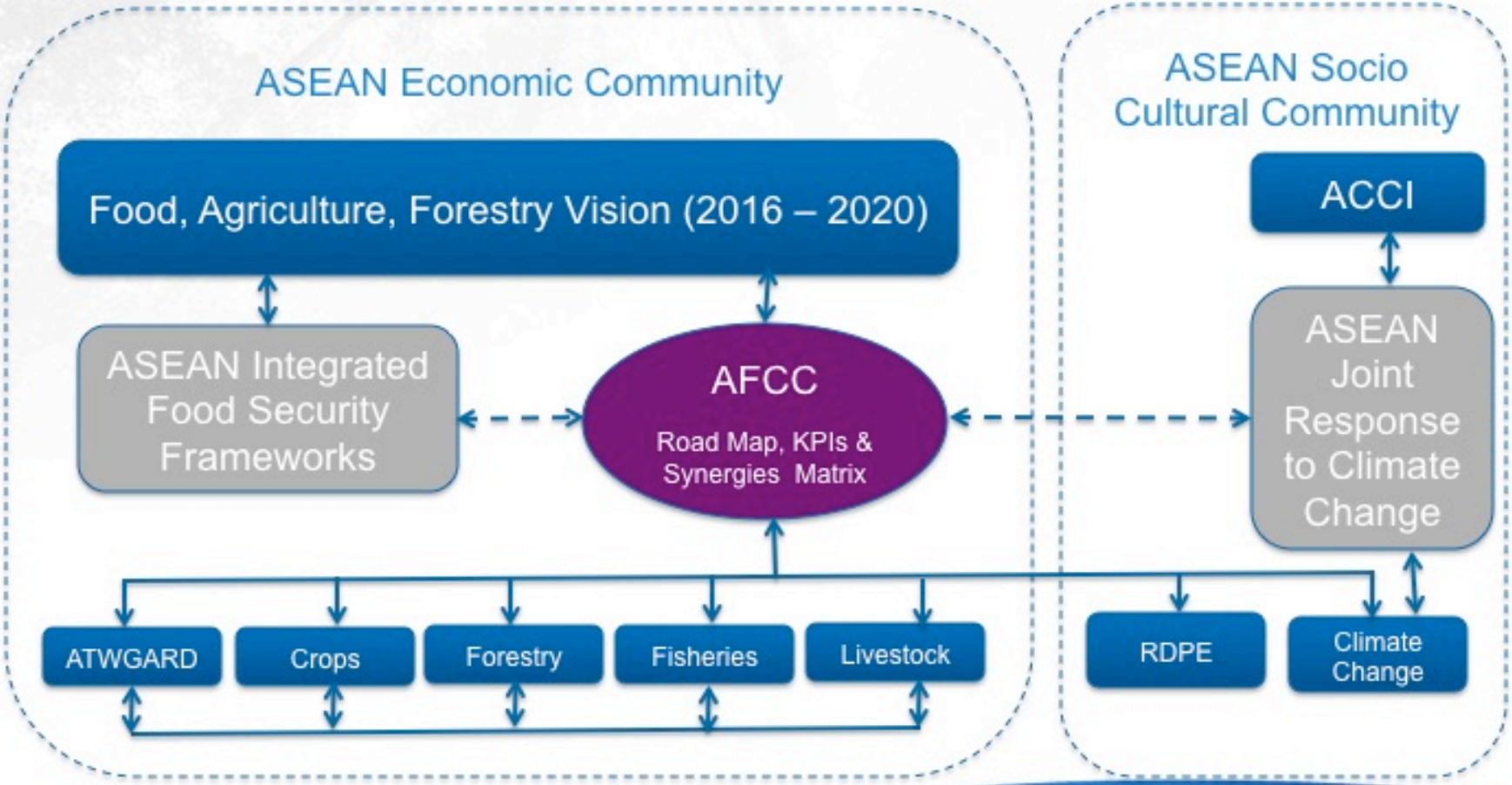
Food, Agriculture and Forestry Vision (FAF 2025)

FAO's definition on food security is when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.

ASEAN Integrated Framework on Food Security (AIFS)

Strategic Thrust 4: Promote **Sustainable Food Production**, at national level through the promotion of sustainable agrifood systems

ASEAN Frameworks & Bodies



AFCC
ASEAN Multisectoral Framework on Climate Change : Agriculture and Forestry towards Food Security

Are we doing Bioeconomy?

- Sufficiency Economy of His Majesty the King of Thailand
- Sustainable Agriculture
- Conservation agriculture
- Organic farming
- Integrated Farming Systems
- Integrated Pest Management
- Integrated Nutrient Management

- Climate Smart Agriculture
- Climate Friendly Agriculture
- Green Economy
- Low Carbon Emission Agriculture
- Renewable Energy in the Rural Areas (Biomass Town)
- etc.

What's new? Are we missing something ?

Bioeconomy in the ASEAN Context

ATWGARD (ASEAN Technical Working Group on Agricultural Research and Development)

- R&D on the whole value chain of agricultural production to enhance productivity (crop, livestock, fisheries) through biological science disciplines
- Reduce postharvest losses
- Bioenergy (Biomass Town projects under AMAF+3)
- ASEAN Climate Resilience Network – ASEAN CRN (knowledge exchange platform in promoting climate smart agricultural practices
- ASEAN – German Response to Climate Change (GAP-CC)
  Forest Response to Climate Change (FOR CC)

Bioeconomy in the ASEAN Context (cont.)

ASWGC (ASEAN Sectoral Working Group on Crops) trade related

- Sanitary and Phytosanitary (SPS)
- Maximum Residue Limits (MRLs)
- GMF Network (Genetically Modified Food Testing Network)
- AARNET – ASEAN –AVRDC Vegetable Research Network
- Standards for horticultural and other food crops
- ASOA – ASEAN Standard on Organic Agriculture

Bioeconomy in the ASEAN Context (cont.)

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- ASEAN – German Programme on Response to Climate Change GAP-CC (Sustainable

Bioeconomy in the ASEAN Context (cont.)

ASWGFi (ASEAN Sectoral Working Group on Fisheries) trade related

- Fishery development related R&D and trade related issues

ASWGL (ASEAN Sectoral Working Group on Livestock)

- Control and regulation of transboundary diseases and trade related issues
- Guidelines to **control pollution** from greenhouse gas emission of livestock production and processing.

FAO - Bioenegy Initiatives

- ASEAN – Bioenergy and Food Security (BEFS)

Bioeconomy in the ASEAN Context (cont.)

AC Pillar 3 : ASEAN Socio-Cultural Community (ASCC)

RDPE (Rural Development and Poverty Eradication)

ASEAN Joint Response to Climate Change

ACCI – ASEAN Climate Change Initiative

ASWGCC – ASEAN Sectoral Working Group on Climate Change

ASEAN- Swiss Partnership on Social Forestry and Climate Change - ASFCC

Ministry of Agriculture and Cooperatives (MOAC) THAILAND

- Sufficiency Economy
- Sustainable Development
- Trade competitiveness
- Climate resilience
- Scaling-up of Climate Smart Agriculture

- Inclusive growth
- Food sufficiency and safety
- Implementation of the SDGs
- Smart Farmer
- ARI4D
- etc.

International Collaborations

- Bilateral collaborations (MOUs)
- Multilateral (Regional and Sub-regional)
- International Organizations (FAO, UN, CGIAR, EU, etc.)
- Agricultural Research Innovation for Development (ARI4D) Consortiums and Associations

Promoting Bioeconomy

- Multisectoral Collaborations
- Regional Mechanism
- Knowledge-Exchange Platform
- Networking
- Responsive to urgent issues and common concerns (national, regional, global)
- Align with national and regional ARI4D agenda
- Political Support by Leaders (ASEAN)

Thanks for Listening

luckymegy@yahoo.com

Biotecnologia Industrial

The most promising vector for Brazil's reindustrialization

Associação Brasileira de Biotecnologia Industrial

November 2015

Founded in April 2014, ABBI is a not-for-profit, non-partisan, civil organization with national reach, and established by a group of business leaders inspired by the **conviction that Brazil currently holds the highest potential to become a global leader of the bio-economy.**

ABENGOA

BASF
We create chemistry

biochemtex

CTC
CENTRO DE TECNOLOGIA CANAVIEIRA

DOW

DSM
BRIGHT SCIENCE. BRIGHTER LIVING.

DUPONT

GranBio

novozymes
Rethink Tomorrow

raízen

RHODIA
SOLVAY GROUP

Who are we?

- **40 years ago...** Brazil established the Pro-Alcool Program.
- **20 years ago...** The establishment of the Convention on Biological Diversity and Brazil's National Biodiversity Program.
- **13 years ago...** Brazil creates a National Biodiversity Policy.
- **10 years ago...** Brazil implements it's Biosafety Law.
- **3 years ago...** Rio+20 talks revamps the discussions of a bioeconomy.
- **2 years ago...** BNDES/FINEP launches the PAISS program to invest USD 2 billion in sugarcane industry innovations.
- **This year...** BNDES/FINEP announces the PADIQ program, to invest USD 500 million in diversification of the chemicals industry.

Still...

- **Lei do Bem...** After 10 years, the law that fostered innovation in Brazil is in jeopardy.
- **New Biodiversity Law...** Is under discussion at the Presidency and will determine what incentives are in place for R&D in biodiversity.

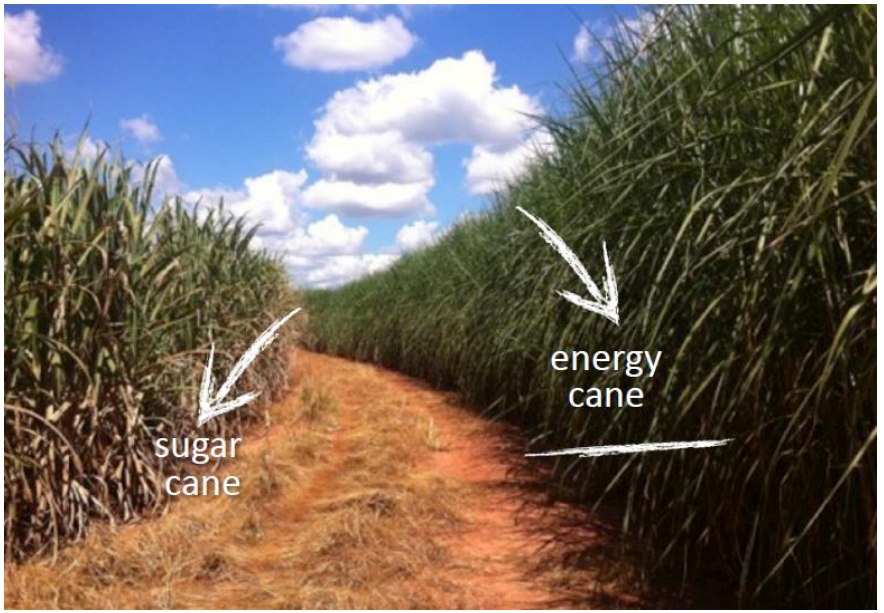
Setting the stage for a NEW bioeconomy in Brazil

Brazil has more than 400 sugarcane mills that can crush around 700 million tons per year. Besides that, due to the lack of financial/technological assets, the majority still processing only the sugarcane juice…

… which represents a great opportunity for those who are able to integrate new technologies, generating synergies and cost reductions for both 1st and 2nd gen ethanol process.

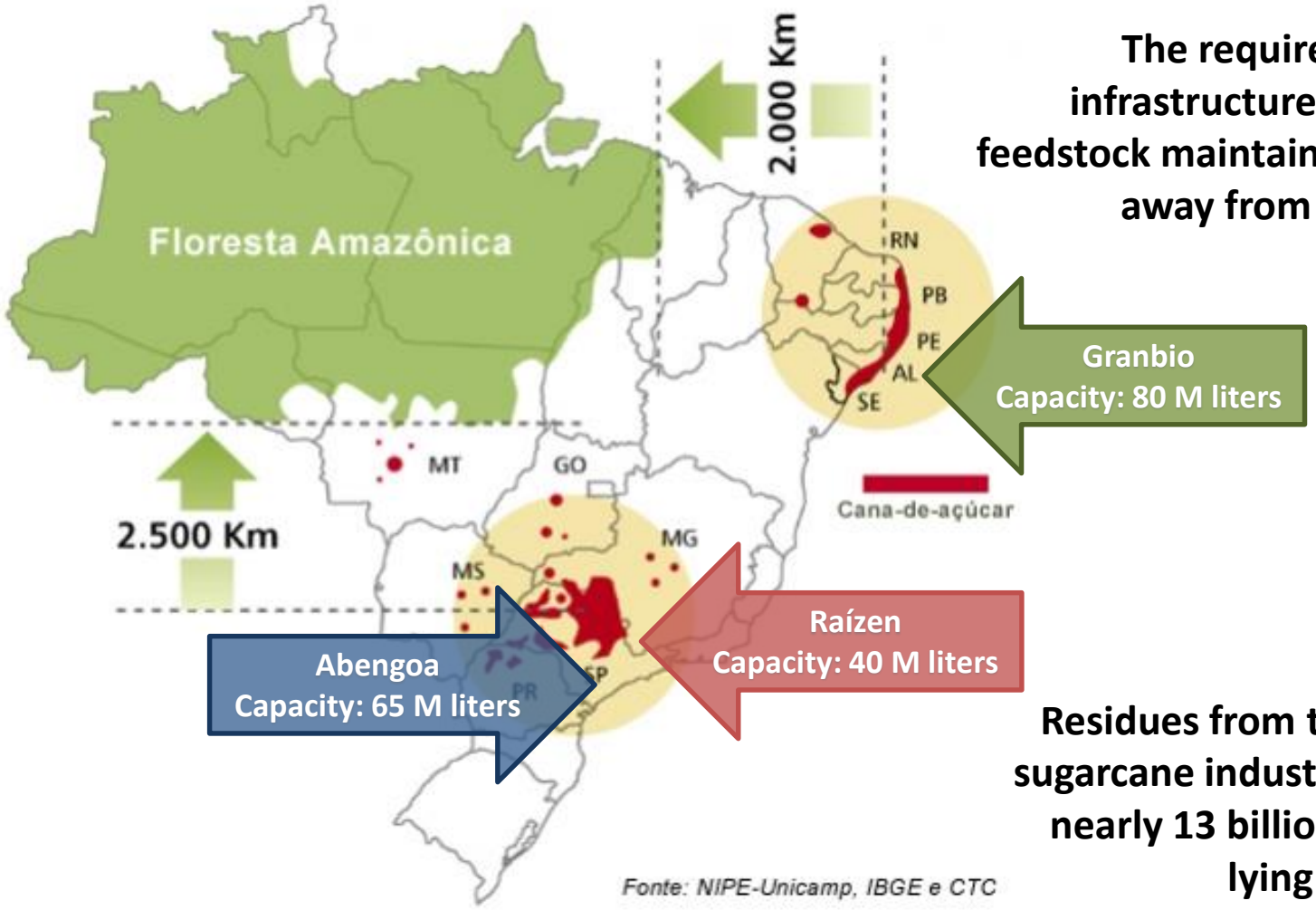
The Brazilian advantages

The economics of sugarcane residues – bagasse & straw vs. Purpose-grown crops – for cellulosic ethanol production are significantly better...



...and the use of energy-cane as feedstock can more than triple the productivity of ethanol production

The Brazilian advantages



The requirement of solid infrastructure and access to feedstock maintains the industry away from native forests

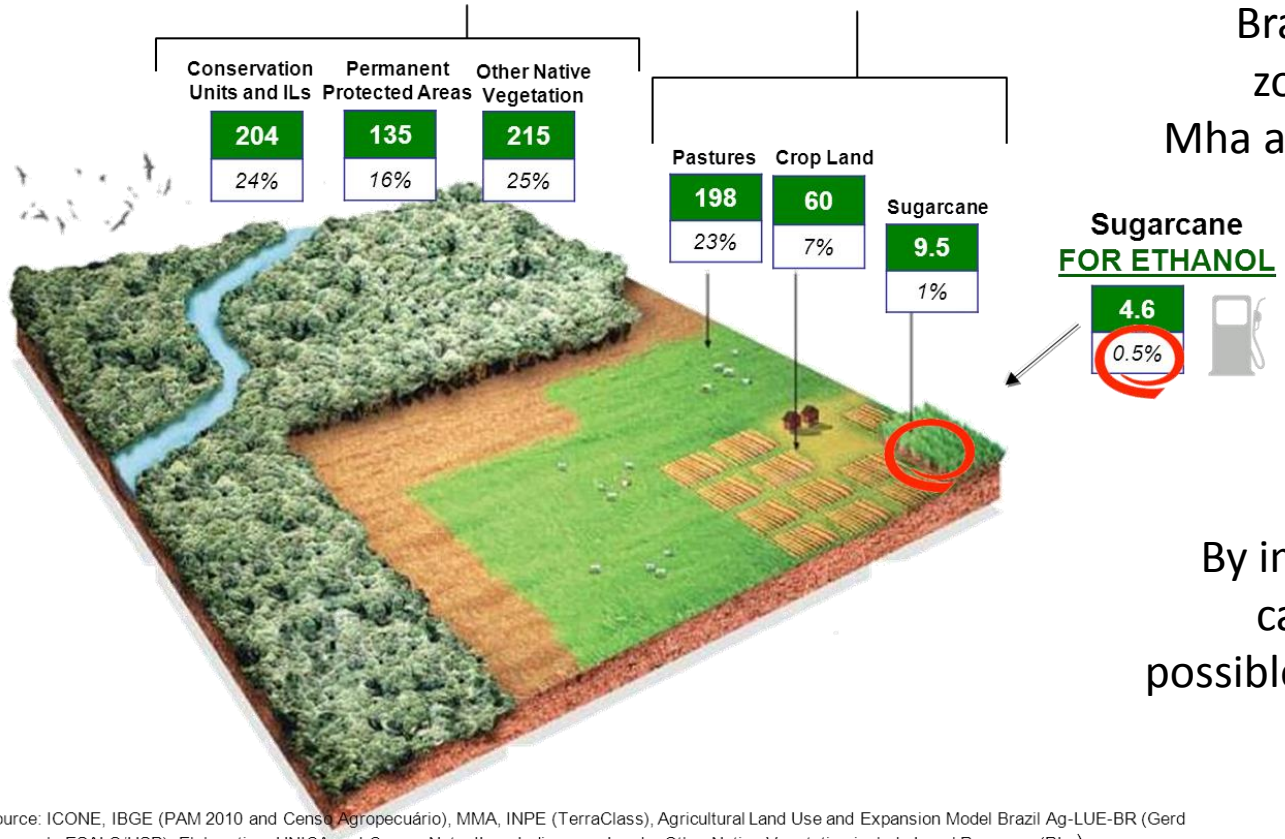
Residues from the traditional sugarcane industry account for nearly 13 billion liters of E2G lying in the ground

Source: NIPE-Unicamp, IBGE, CTC, ABBI

The deforestation myth

Million Hectares

Total Area	Native Vegetation	Land in Actual Use	Other Uses
851	554	258	38
100%	*65%*	*30%*	*5%*



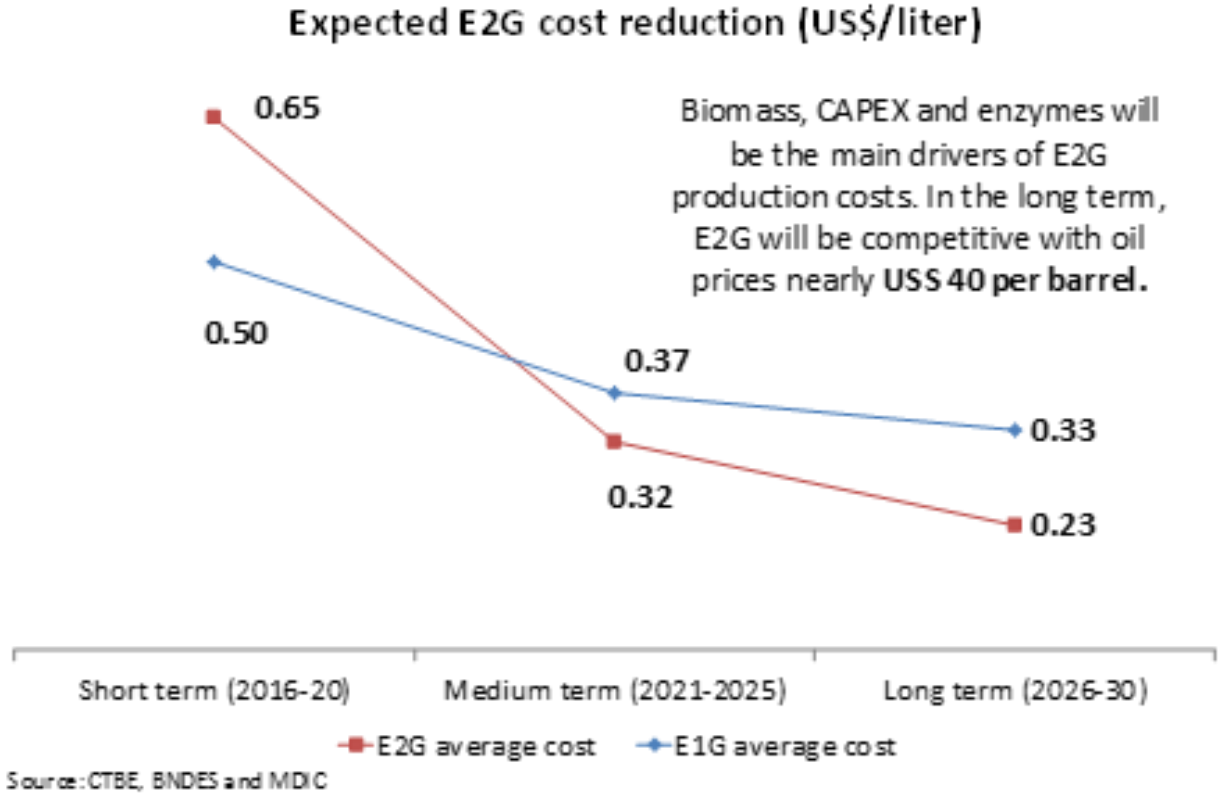
Brazilian federal agricultural zoning considered up to 64 Mha able to produce sugarcane w/o irrigation

By improving the low yield of cattle production it will be possible to free large amount of land for other purposes.

Source: ICONE, IBGE (PAM 2010 and Censo Agropecuário), MMA, INPE (TerraClass), Agricultural Land Use and Expansion Model Brazil Ag-LUE-BR (Gerd Sparovek, ESALQ/USP). Elaboration: UNICA and Cosan. Note: ILs = Indigenous Lands. Other Native Vegetation include Legal Reserves (RLs)

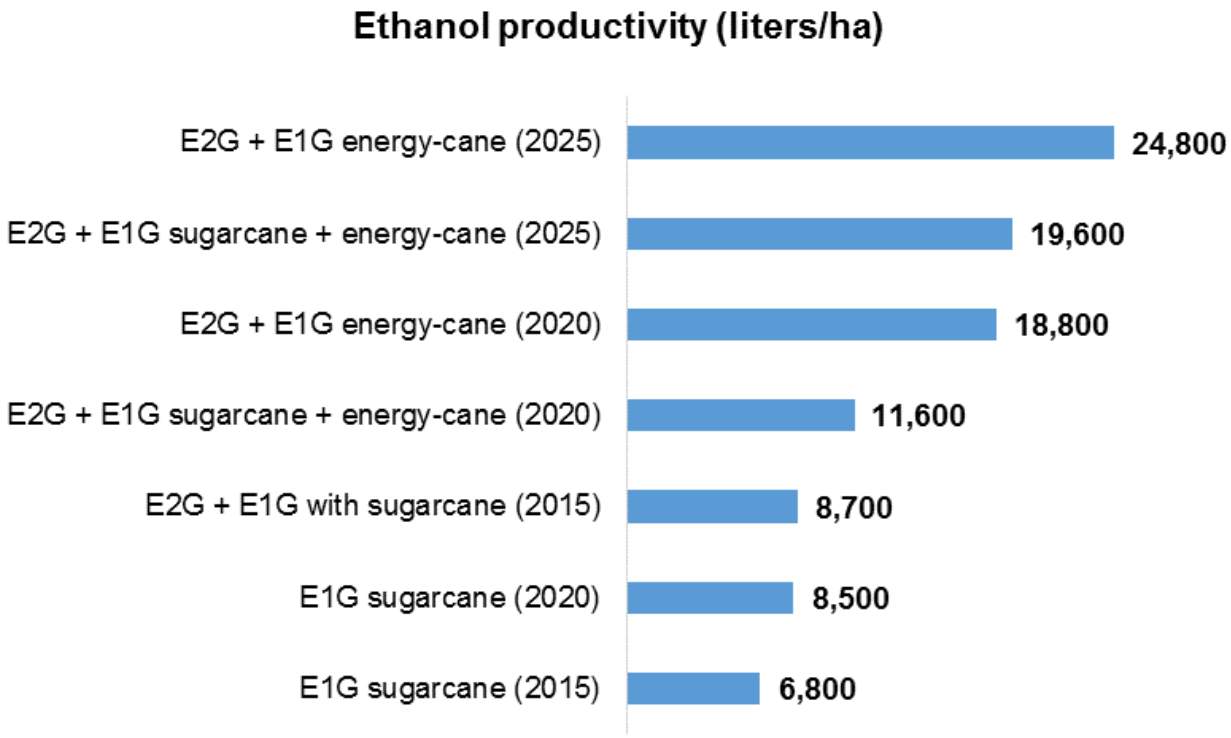
The food vs. fuel dilemma

A study conducted by BNDES, CTBE and MDIC has indicated that, with consistent public policies in place, the efficiency of E2G technologies will improve significantly over the next decade.



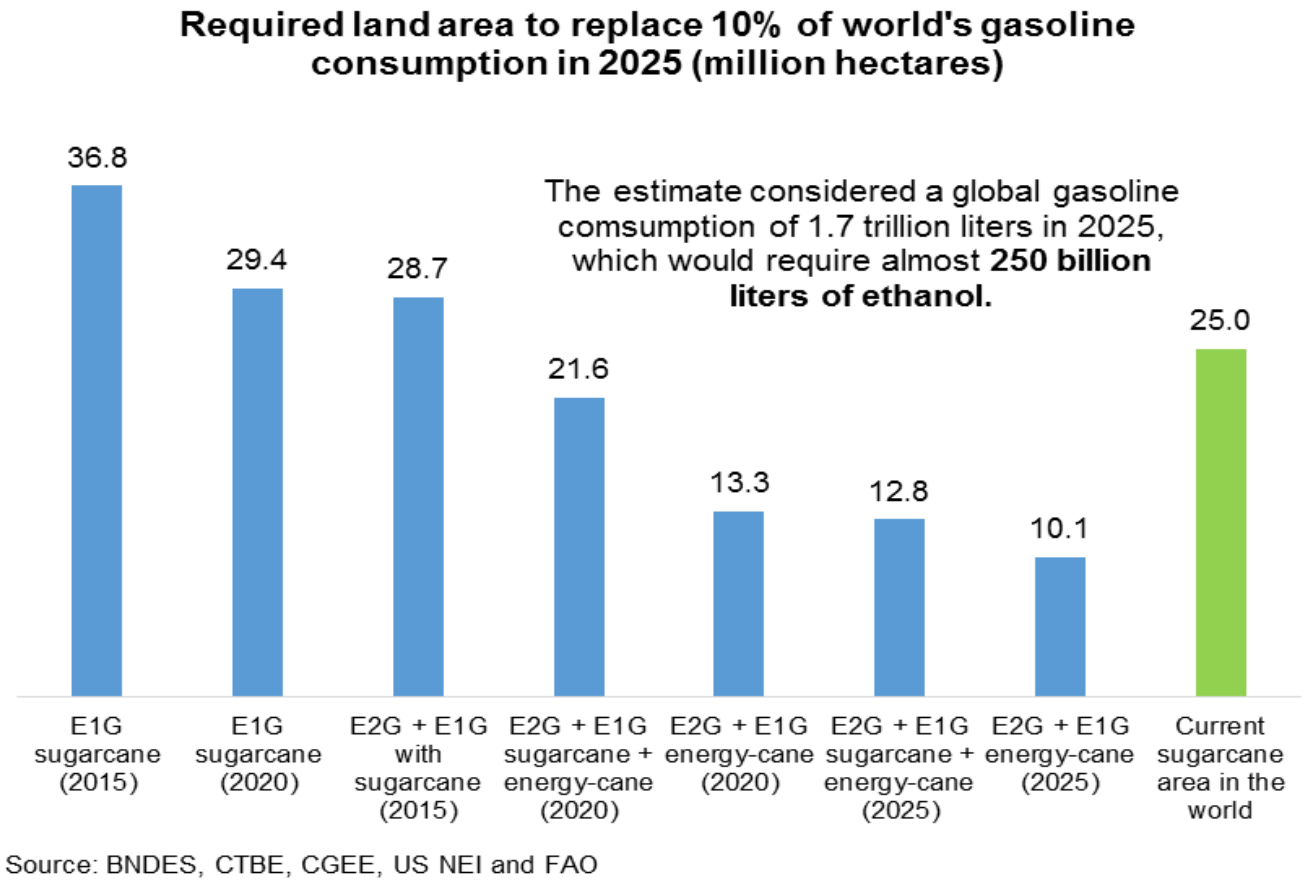
Prospects for increased competitiveness

Furthermore, productivity drivers include improvement of microorganism and technology efficiencies, coupled with the consolidation of energy-cane as feedstock.



Source: BNDES, CTBE, MDIC and CGEE

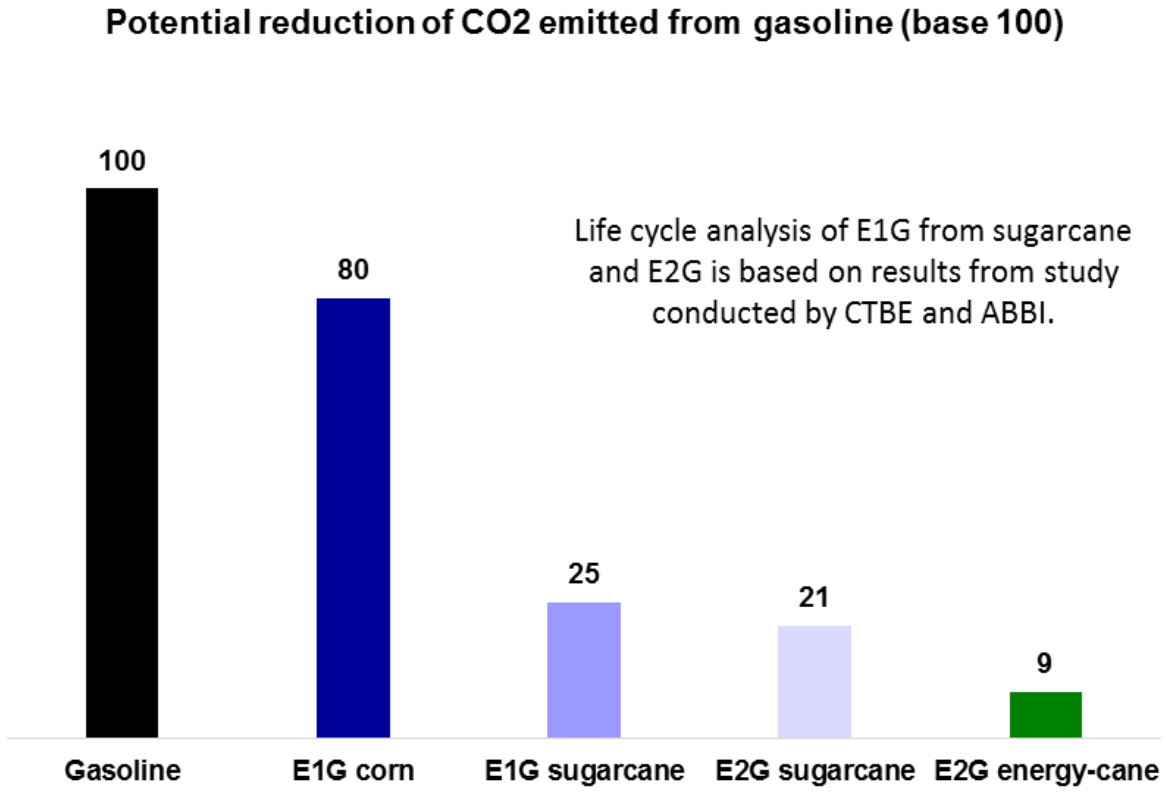
Where will growth come from?



Source: BNDES, CTBE, CGEE, US NEI and FAO

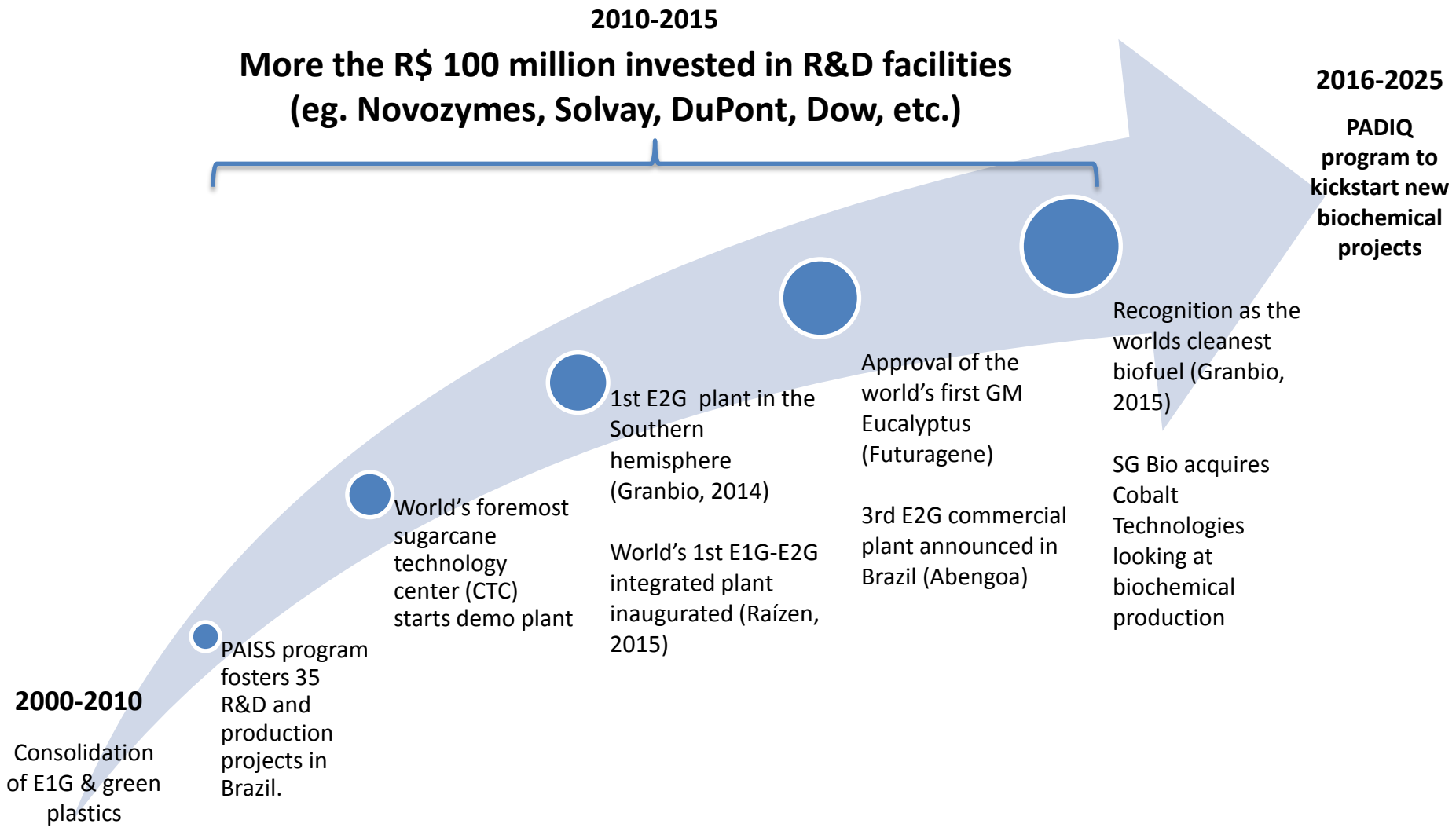
Looking at the big picture

E2G can provide an enormous reduction of GHG emissions by replacing gasoline consumption with a non-food biomass feedstock.



Source: US EPA, BNDES, CTBE and ABBI

The environmental benefits

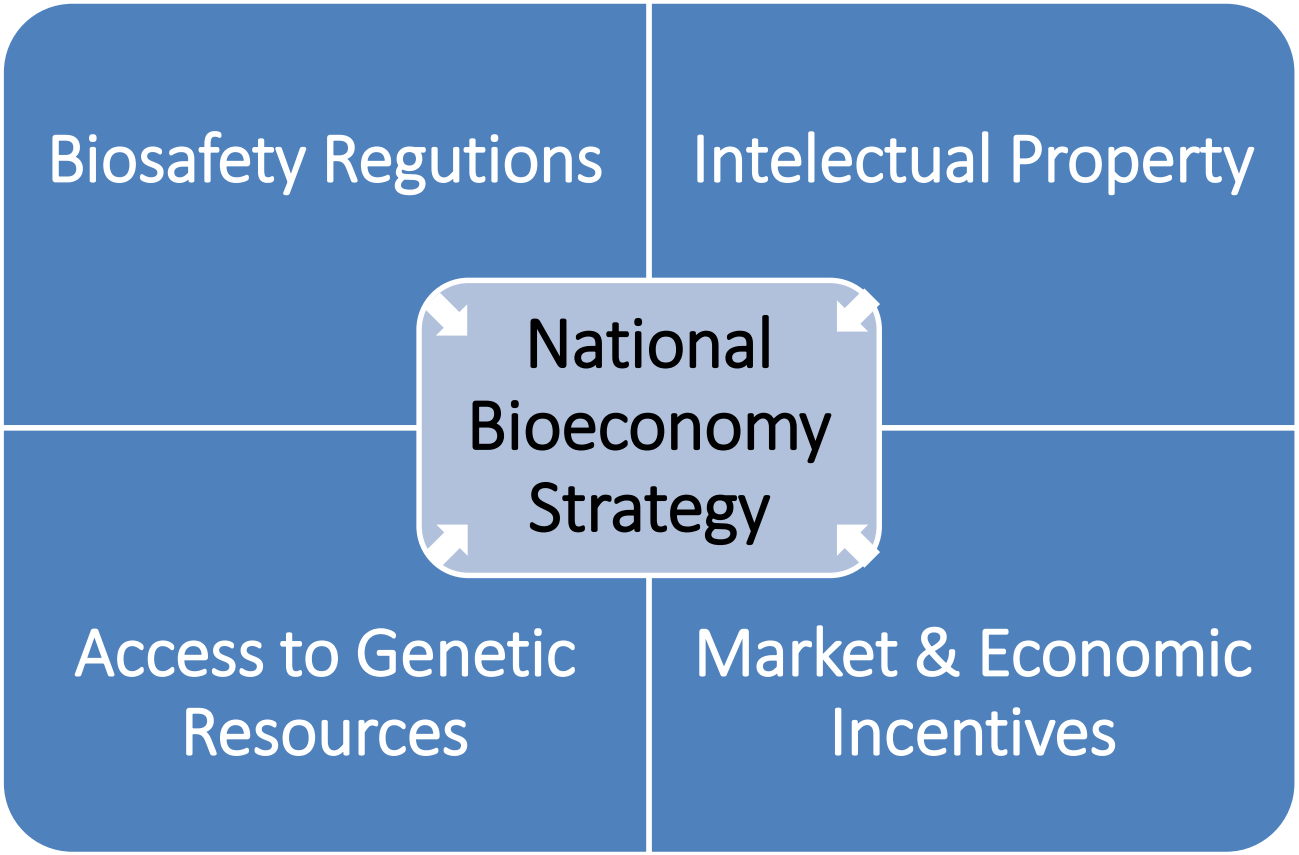


The path towards the bioeconomy

Competitiveness

Segment	Market BR (US$B, 2012)	Brazilian Share (%)	Global growth (12-07)	Brazilian Growth (12-07)	Imports (US$ M)	Exports (US$ M)	Unit Price (US$ /kg)
Cosmetics	41.8	9.7%	4.1%	12.4%	830	580	5.4
Defensives	9.7	20.5%	7.6%	16.1%	5,400	500	11.3
Animal feeding additives[1]	1.10	10.0%	3.7%	10.1%	458	310	2.5
Butadiene, Isoprene	1.95	5.7%	1.1%	3.2%	860	740	2.5
Flavors and fragrances	1.20	5.1%	3.3%	6.5%	295	317	5.2
Oilfield chemicals	0.71	3.6%	11.2%	24.6%	85	9	1.7
Surfactants	1.54	5.7%	3.0%	6.9%	315	185	3.0
Aromatics[2]	2.52	1.6%	3.8%	5.2%	1,154	0	1.2
Polyurethanes	1.50	3.5%	1.6%	5.8%	944	83	2.7
Cellulose derived products	0.33	1.3%	6.3%	1.1%	190	37	3.5
Lubricants	4.5	3.5%	1.0%	2.6%	1,127	209	2.4
Food additives*	0.65	3.0%	3.8%	4.1%	367	625	2.8
Oleo chemicals	0.66	2.8%	8.1%	23.2%	230	179	1.7
Carbon Fiber	0.10	9.4%	7.9%	107.4%	97	0	24.4
Mining chemicals	0.19	4.1%	2.3%	7.6%	93	8	2.2
Leather chemicals	0.38	8.1%	2.8%	3.7%	111	83	1.7
Silicon Derived Products	0.42	3.0%	3.7%	5.2%	190	536	2.5
Construction chemicals	0.17	1.7%	3.7%	5.0%	30	4	1.1
Polyamides	1.28	1.7%	1.9%	-5.2%	509	14	3.4

Moving towards green chemicals



Future-looking agenda: What is needed?

ABBI
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BIOTECNOLOGIA INDUSTRIAL

BRAZILIAN INDUSTRIAL
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African Centre for Technology Studies

ACTS

Knowledge for Better Livelihoods

Inclusive Bio-economy

Catalysing and Enhancing Africa's Benefits

Hailemichael Teshome Demissie, PhD

Head, Inclusive Bio-economy Program

African Centre for Technology Studies (ACTS)

Nairobi, Kenya

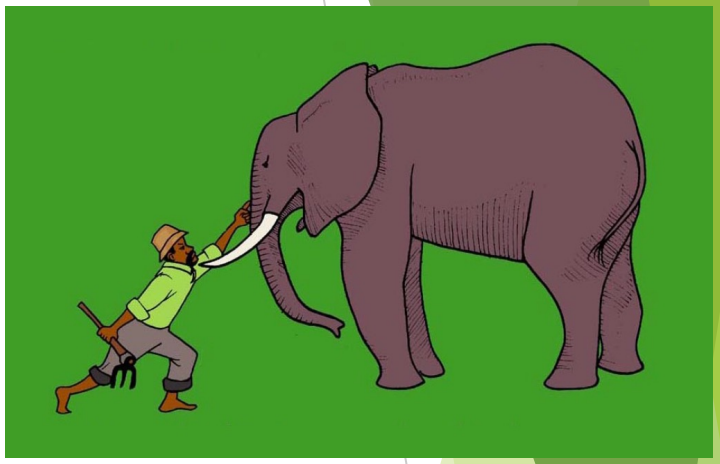
Inclusive Bio-economy

Concept and Significance

Broader than biotechnology- an enlarging spectrum of products and processes - the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy.

- Biotechnology to contribute 2.7 % of the GDP in OECD and even more in developing countries by 2030 (OECD, 2009)
- In 2015, half of the global production of food, feed, and industrial feedstock comes from biotechnologically developed plant varieties (GM, MAS, intragenics, etc)
- Rapid growth of the sectors of the bio-economy underway
- Increasing recognition of its impact in regional, national and sub-national policy strategies:
- Strategies with direct and indirect reference to the bioeconomy

Anecdotes of an emergent African bio-economy



- Resolving human - wildlife conflict with aloe vera
- Turning the curse into a blessing: mathenge (*Prosopis juliflora, the devil tree*) and Mexican marigold (*Tagetes Minutas*)
- New uses to old crops: beer from sorghum and rice
- Multiple benefits from one instance of bioeconomy:
  - the use of detergents in rural households, the use of drylands
  - Revitalisation of mature industries – the case of Rivatex in Kenya

Inclusive bio-economy

- Inclusive- away from ‘winner takes all’ paradigm of market fundamentalism and exclusion – ‘no one will/must be/is left behind’ – the SDGs
- Inclusivity – even more significant with emerging labour-displacing disruptive technologies and growing inequalities
- Inclusivity between and within nations – focus on those excluded for specific reasons (gender, age, disability, ethnicity, historical disadvantage, etc)
- The bio-economy as disruptive – protecting the continent from disruptive impacts
- Lessons from the GM debate-patents and exclusion

The Global Policy Environment for the Bio-economy

- A strong innovation potential in the bio-economy due to the use of Key Enabling Technologies (KETs) (biotechnology, nanotechnology, synthetic biology, big data, etc….
- The bioeconomy as global -an international industry based on international business models
- Developing countries as the main beneficiaries- (Cologne paper, the OECD)-to contribute 2.7% to the GDP in OECD countries by 2030 and more in developing countries.
- Developing countries will see the highest growth of green biotechnology
- Scientific Advisory Board to the UNSG: **science has to be considered as a public good** that is integral to achieving any of our common goals.

- The focus should be on **inclusive approaches centred more on knowledge of all types and less on high-end technology and sophisticated data**.

Engaging the Bio-economy in Africa

- STISA 2024 Mission: Accelerate Africa's transition to an innovation led, knowledge based economy
- ACTS strategic plan: bio economy for Africa to 'catch-up' with most advancing countries
  - Research : Critical appraisal of the bio-economy policy landscape in Africa and review of the legislative and policy frameworks for biosciences, biotechnologies, biosafety, and bio-economy overall, to assess the need for African bio-economy policies and strategies
  - Strengthening Legislative and Policy Frameworks for the Production, Commercialization

    and uptake of Bio-innovation Products and Services
- Technology Brokerage : Support local production, commercialization and uptake of bio-innovation products for food, feed, energy and other purposes
- Revitalisation of mature industries through bio-innovation products and processes
- Policy Engagement : convening high level regional policy roundtables on bio-economy policy strategies
- Capacity Building : training on the global bio-economy policy strategies, opportunities and challenges for Africa

Dealing with Scepticism and Pessimism

26 November 2015

Bioeconomy Policy Analysis

Policy Instruments for Sustainability in Bioeconomy Value Chains

Presented by: Sergio Ugarte

Contents

- Value chains and sustainability criteria
- Integration and coupling
- Level of assurance

GLOBAL BIOECONOMY SUMMIT 2015

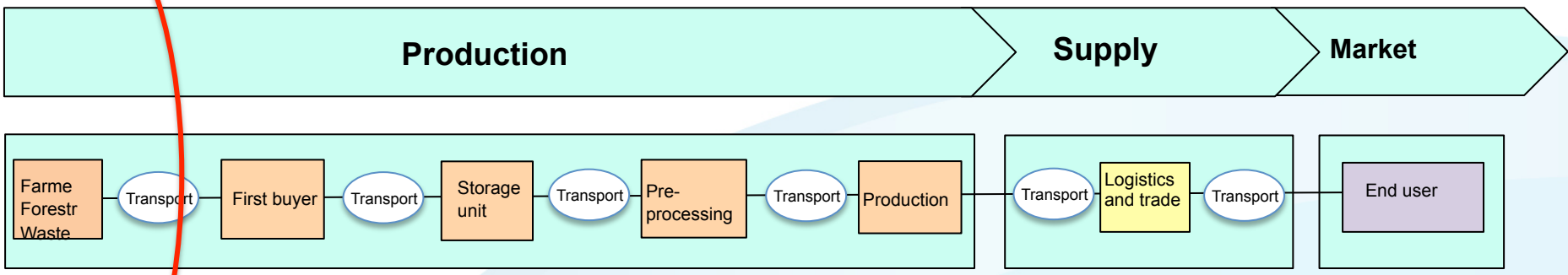
Different uses – same chains

Feedstock

Biomaterials

Food & feed

Weakest link for sustainability



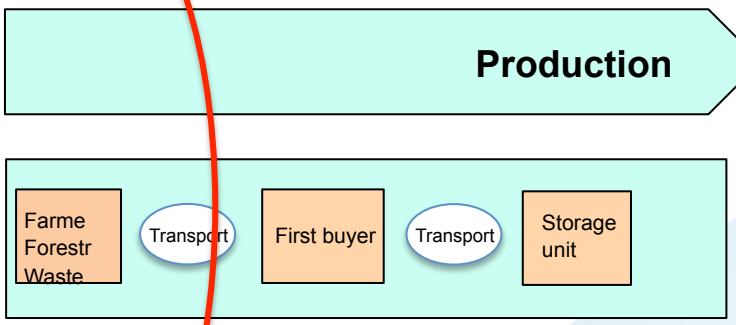
Different uses – same chains

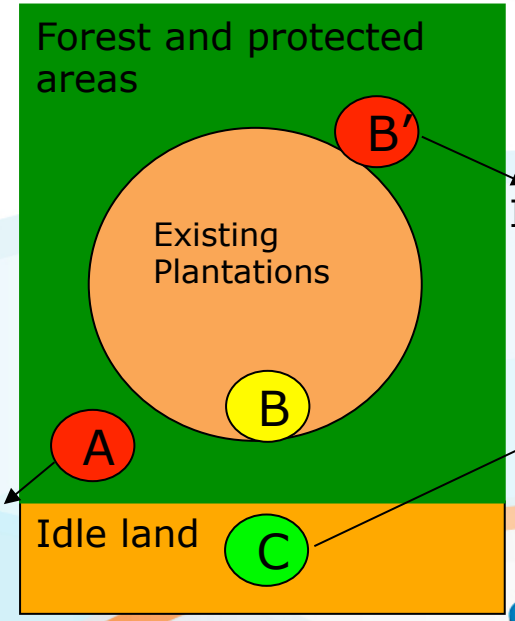
Feedstock

Biomaterials

Food & feed

Weakest link for sustainability





Indirect Land-Use Change

Sustainable biomass production

Only residues, otherwise Land Use Change

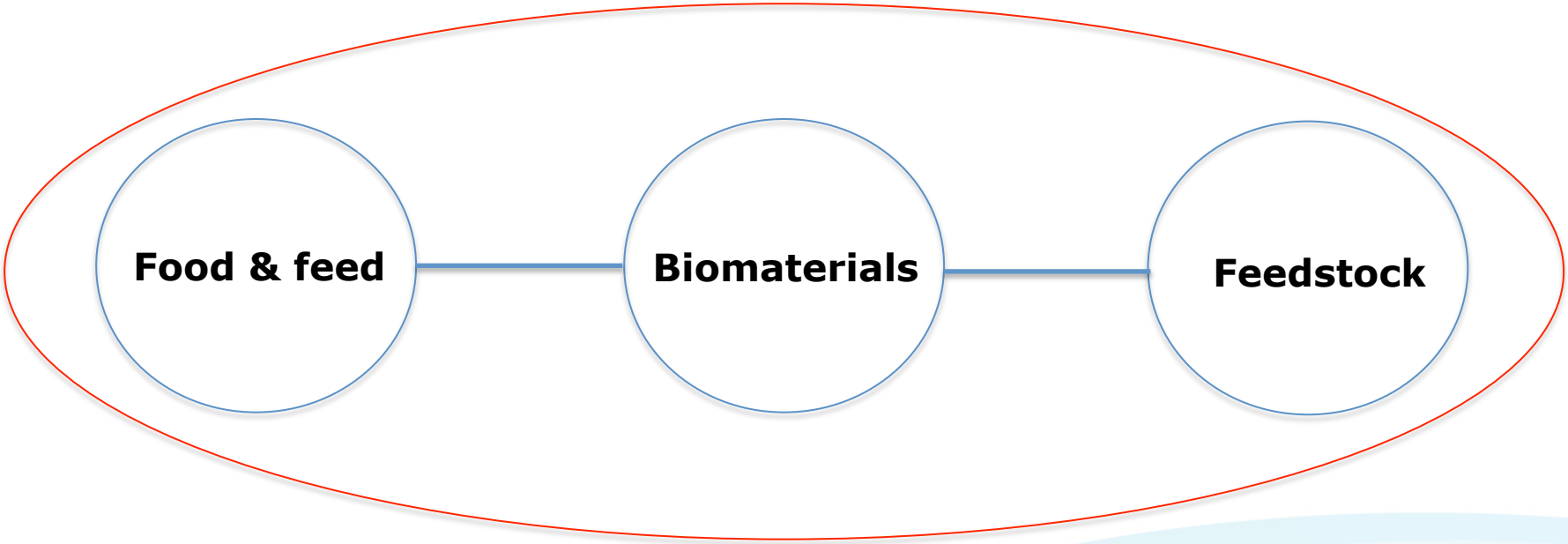
sustainable quality consult

Policy needs defined criteria

	Feedstock	Biomaterials	Food & feed
Decarbonisation	√√√ (M)	√√ (V)	X (V)
Biodiversity	√√ (M)	√√ (V)	√√√ (V)
Other environmental	√ (V)	√ (V)	√ (V)
Social issues	√ (V)	√ (V)	√ (V)
Competition w/food, ILUC	X (V)	X (V)	

(M) Mandatory **(V) Voluntary**

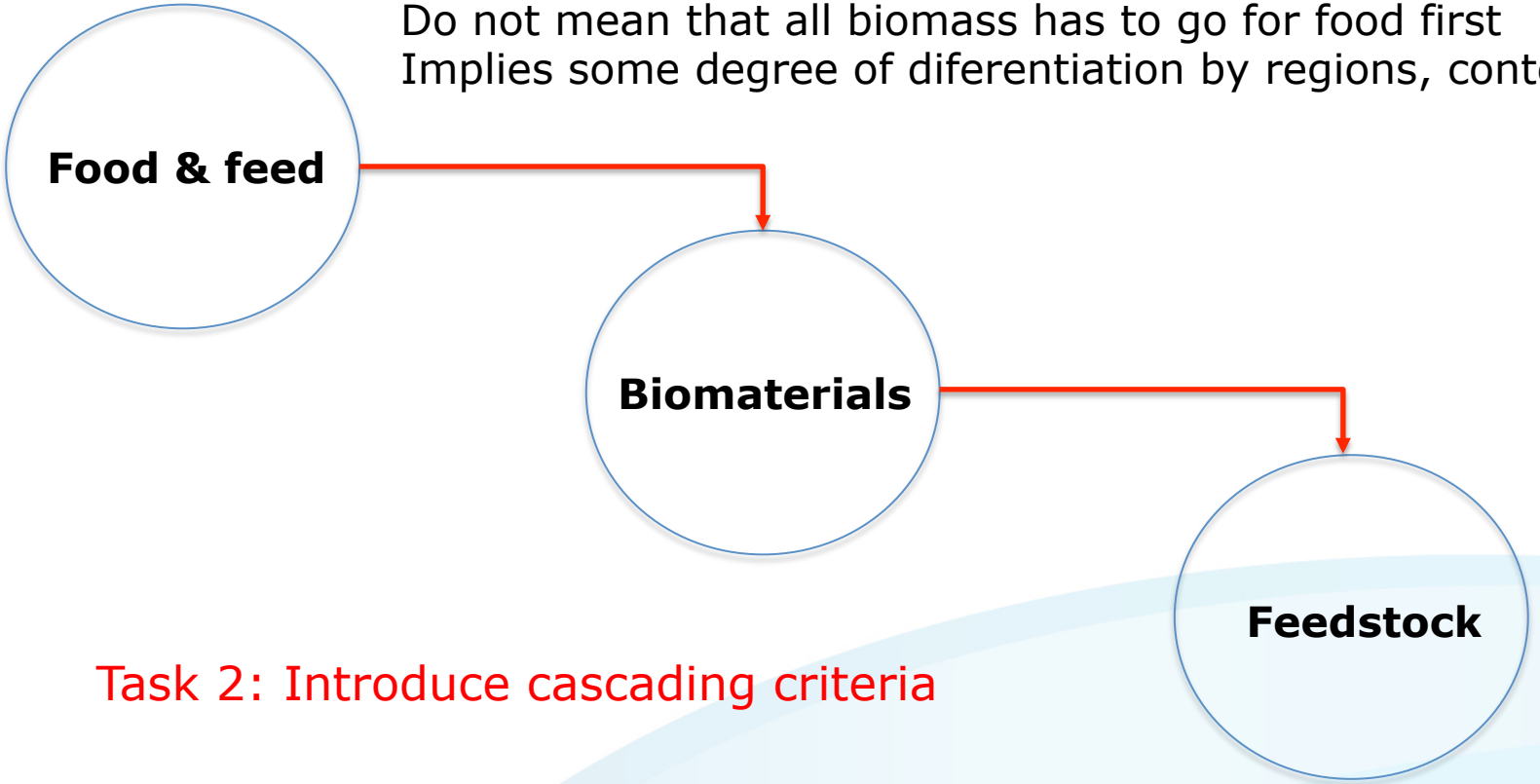
How to make it work?



Task 1: Integrate chains & homogenise sustainability criteria

How to make it work?

Do not mean that all biomass has to go for food first
Implies some degree of diferentiation by regions, contexts



Task 2: Introduce cascading criteria

Task 3: Couple & improve social and food competition criteria

Level of assurance

Risks

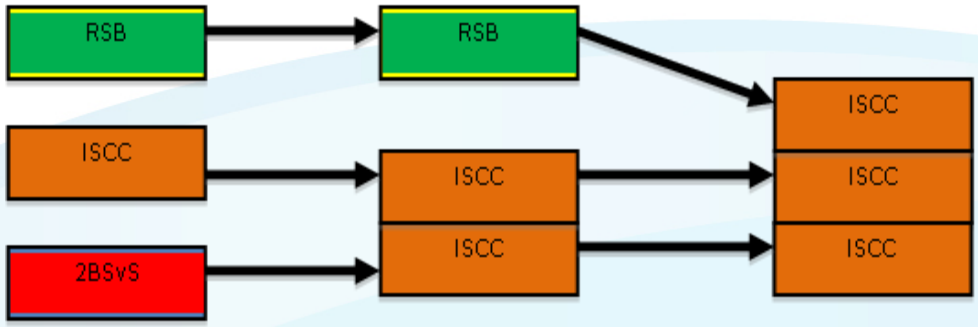
1. **Voluntary implementation**

Entirely up to market players.

May assume own verification or third party certification.

2. **Co-regulation**

Combines public regulation and private initiatives (certification).



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