CPLC Americas Working Group

Call

April 20, 2021, 11 am to 12:30 pm

COPENOR

Jose Ricardo Uchôa C. Almeida
CEO - Metanor/Copenor

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AGENDA

1. Petrochemical Brazilian Industry Overview and Braskem's Positioning on the Circular Economy

2. Copenor Overview and ESG as its Central Strategy

3. Brazilian Renovabio Program and CBios

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Petrochemical Brazilian Industry Overview

6ª posição

País	Vendas Líquidas*
China	1.361,1
EUA	564,9
Japão	203,4
Alemanha	190,0
Coréia	158,3
BRASIL	100,8
Índia	88,3
Rússia	83,7
França	81,0
Taiwan	80,7
Itália	58,0
Holanda	55,0

- **Does not include Pharmaceutical Products**

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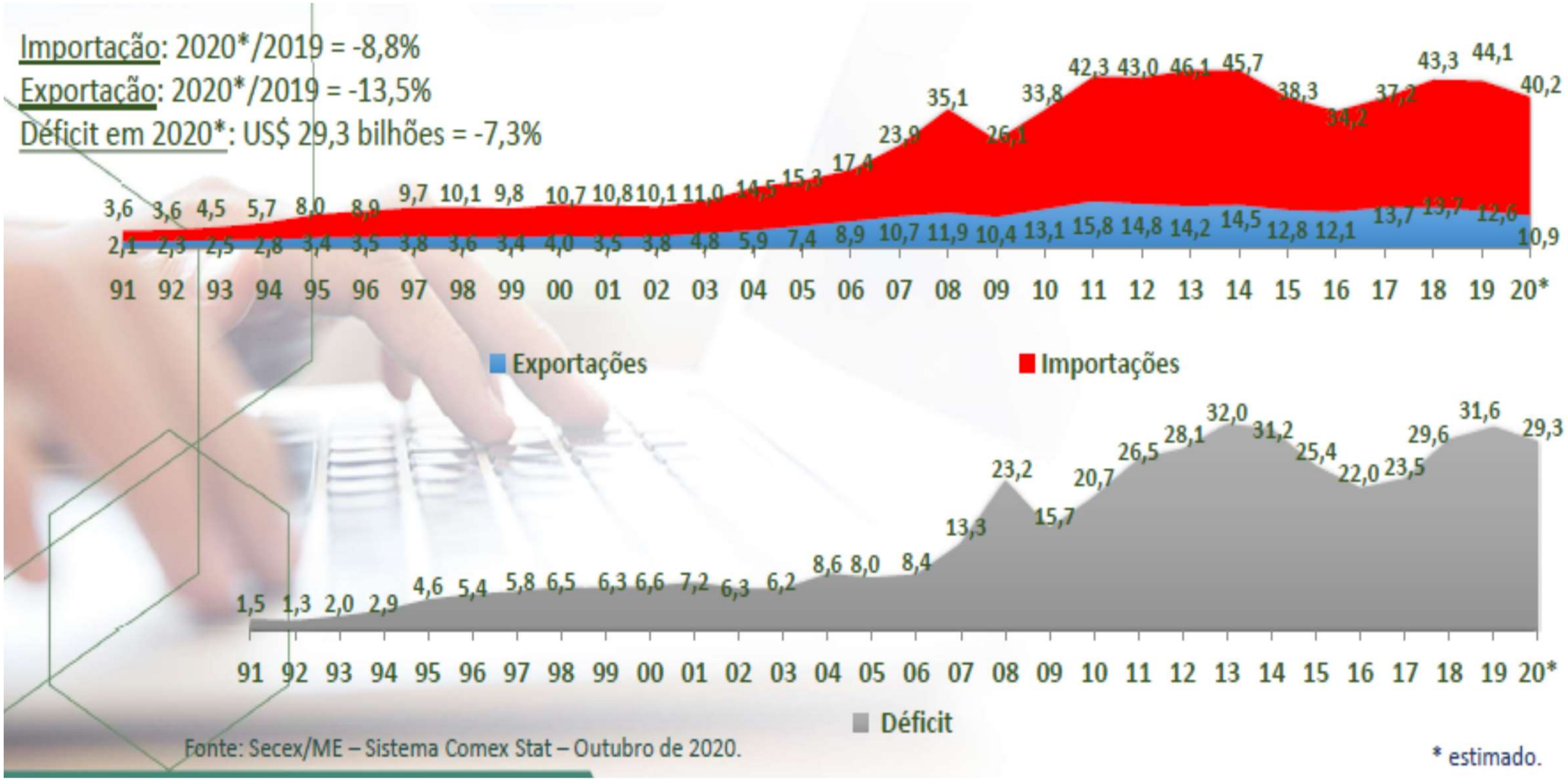
Petrochemical Brazilian Industry Overview



Source: Abiquim

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Braskem's Positioning on the Circular Economy

1 Work with our clients and value chains to design new products that increase efficiency, recycling and reuse.

2 Invest in the development of new renewable products to support circular economy at the beginning of the value chain.

3 Develop new technologies, business models and systems for improving the recycling chain and recovering the material.

4 Encourage consumers' engagement for recycling and recovery programs through education to promote the value of plastic waste to the economy.

5 Use of science based tools, such as LCA, to select the better impact option in terms of economic, social and environmental impacts.

6 Measure and communicate recycling and recovery indicators for plastic packaging materials.

7 Engage partnerships in understanding, preventing and solving the mismanagement plastics residues, especially the problem of debris in oceans.

8 Support public policies to improve solid waste management and recycling chain, especially of plastic waste.

With the shutdown of the methanol plant, Copenor's main activities became:

I - Formaldehyde and hexamine production

FORMOL

↓

Herbicide Production

AGRO Business

HEXA

↓

Resin Production

Automobilistic Industry

HEXA

↓

Resin Production

Construction

II- Import and Distribution of methanol

METHANOL

↓

Biodiseel Production

BIO FUELS

METHANOL

↓

PULP Production

PAPER and CELLULOSE

METHANOL

↓

GENERAL CHEMICALS

Chemical Industry

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Import and Distribution of methanol

Chile - METANEX
6.000 t/mês (Port of Aratu)
. 25% for own consuption
. 75% for distribution

Trinidad Tobago / EUA - SCC
2.000 t/mês (Port of Paranaguá)
100% for distribution

○ **Methanol**

△ **Methanol as raw material for formaldehyde and hexamine**

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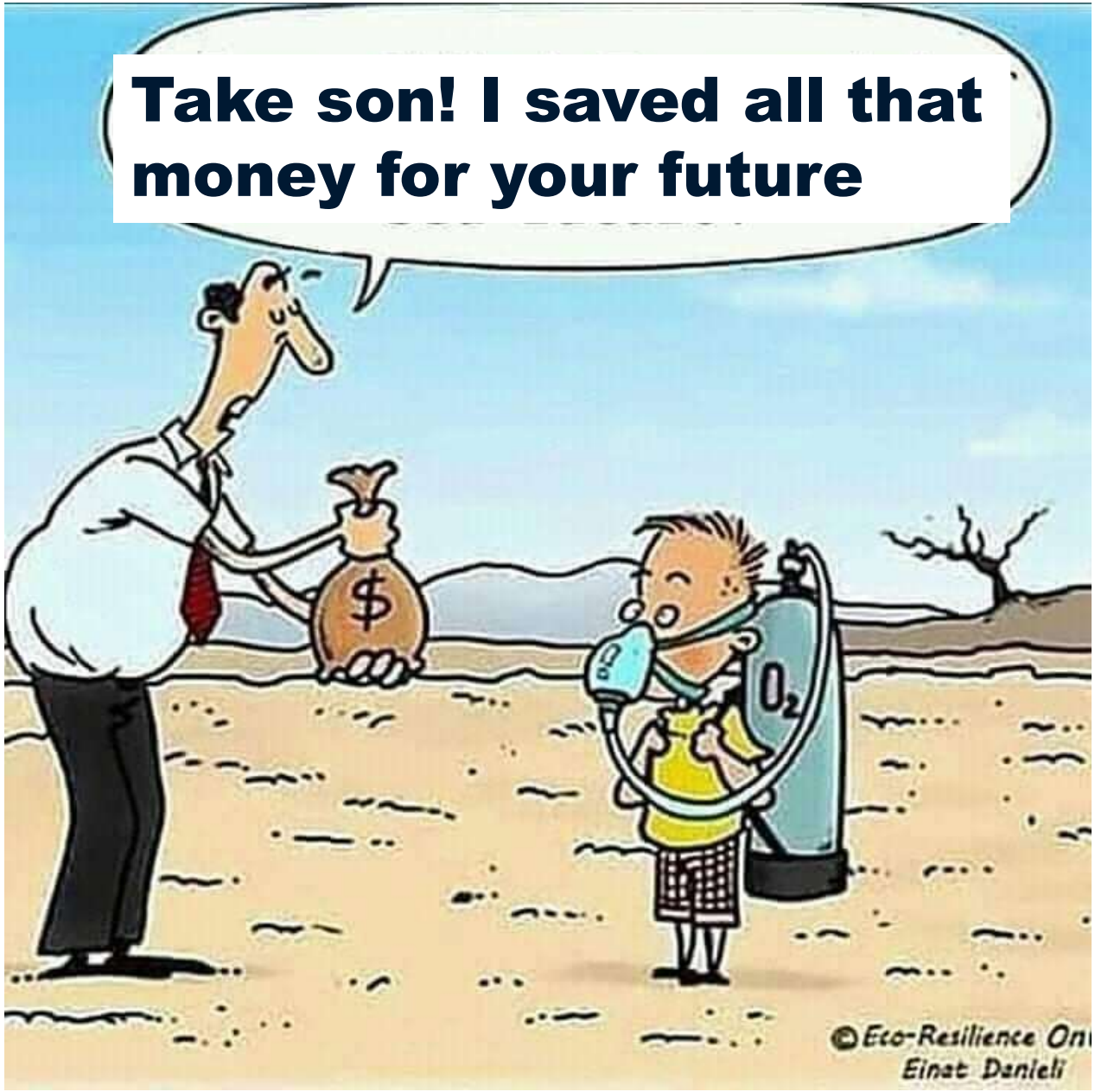
"A *picture* is *worth* a *thousand words*"



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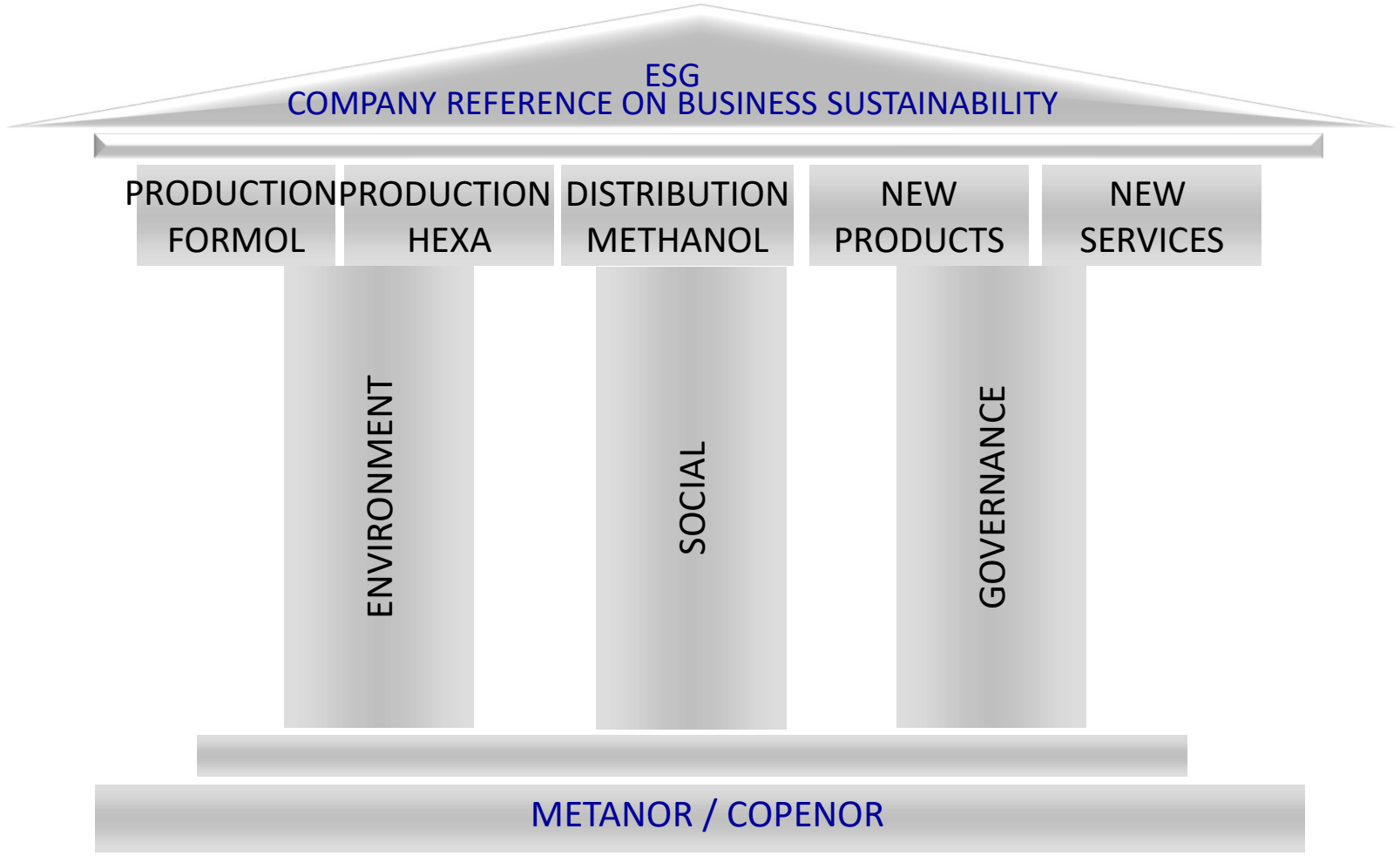
What should COPENOR's strategy be?



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Elaboration of an Inventory of GHG Emissions

Environmental Pillar

Menu de navegação da ferramenta de cálculo GHG Protocol. (Fonte: PROGRAMA BRASILEIRO GHG PROTOCOL, 2019)

Escopo	Categoria da fonte	Atividade relacionada
Escopo 1	Combustão móvel	Consumo de combustível fóssil em veículos de frota própria
	Combustão Estacionária	Consumo de combustível fóssil em fontes estacionárias como geradores, caldeiras e equipamentos térmicos de processo
	Emissões Fugitivas	Liberação intencional de CO_2 na manutenção e recarda de extintores de incêndio na unidade e liberação não intencional do vazamento de gases de refrigeração tanto na área industrial quanto na área administrativa
	Emissões de Processos	Proveniente do processo de calcinação de produtos, formando NO_x
	Tratamento de Resíduos gerados nas operações tratados internamente	Unidade de tratamento de resíduos gerados pelo processo industrial.
	Efluentes	Tratamento de efluentes gerados pelo processo industrial
Escopo 2	Aquisição de Energia Elétrica	Utilização de energia elétrica proveniente do grid nacional de fornecimento, que possui impacto próprio na sua geração
Escopo 3	Categoria 1 – Bens e Serviços Comprados	Emissões de GEE provenientes da produção de insumos industriais necessários
	Categoria 4 –Transporte e Distribuição (Upstream)	Consumo de combustíveis fósseis em veículos da frota terceirizada para transporte de insumos industriais
	Categoria 5 – Resíduos Gerados nas operações (Efluentes Sanitários)	Tratamento de resíduos sanitários tratados por empresas terceirizada
	Categoria 6 – Viagens a negócios	Viagens aéreas de funcionários a serviço da empresa
	Categoria 7 – Deslocamento de Funcionários (casa-trabalho)	Deslocamento casa-trabalho de funcionários utilizando transporte fornecido pela empresa.
	Categoria 9 –Transporte e Distribuição (Downstream)	Consumo de combustíveis fósseis em veículos da frota terceirizada para transporte dos produtos até os clientes.
	Categoria 11 – Uso de bens e Serviços	Emissões de GEE provenientes do uso dos produtos nas unidades de craqueamento catalítico dos clientes
	Categoria 12 – Tratamento de fim de vida dos produtos vendidos	Emissões de GEE oriundos da disposição final de produtos já utilizados pelos clientes
	Categoria 13 – Bens arrendados	Centros de distribuição logística de produtos perto de clientes

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Advantages in the elaboration of GHG Emissions Inventory

- **The elaboration of the greenhouse gas (GHG) inventory is the first step for an institution or company can contribute to the fight against climate change.**

- **(As second step) Knowing the emission profile, from the inventory, it is possible to establish strategies, plans and targets for the reduction and management of greenhouse gas emissions.**

- **Other advantages of carrying out the inventory:**

Strengthen your reputation to get Financing with more competitive costs (ESG Funds)
New business opportunities in the carbon market;
attract new investments.
Plan processes that guarantee economic, energy and operational efficiency.

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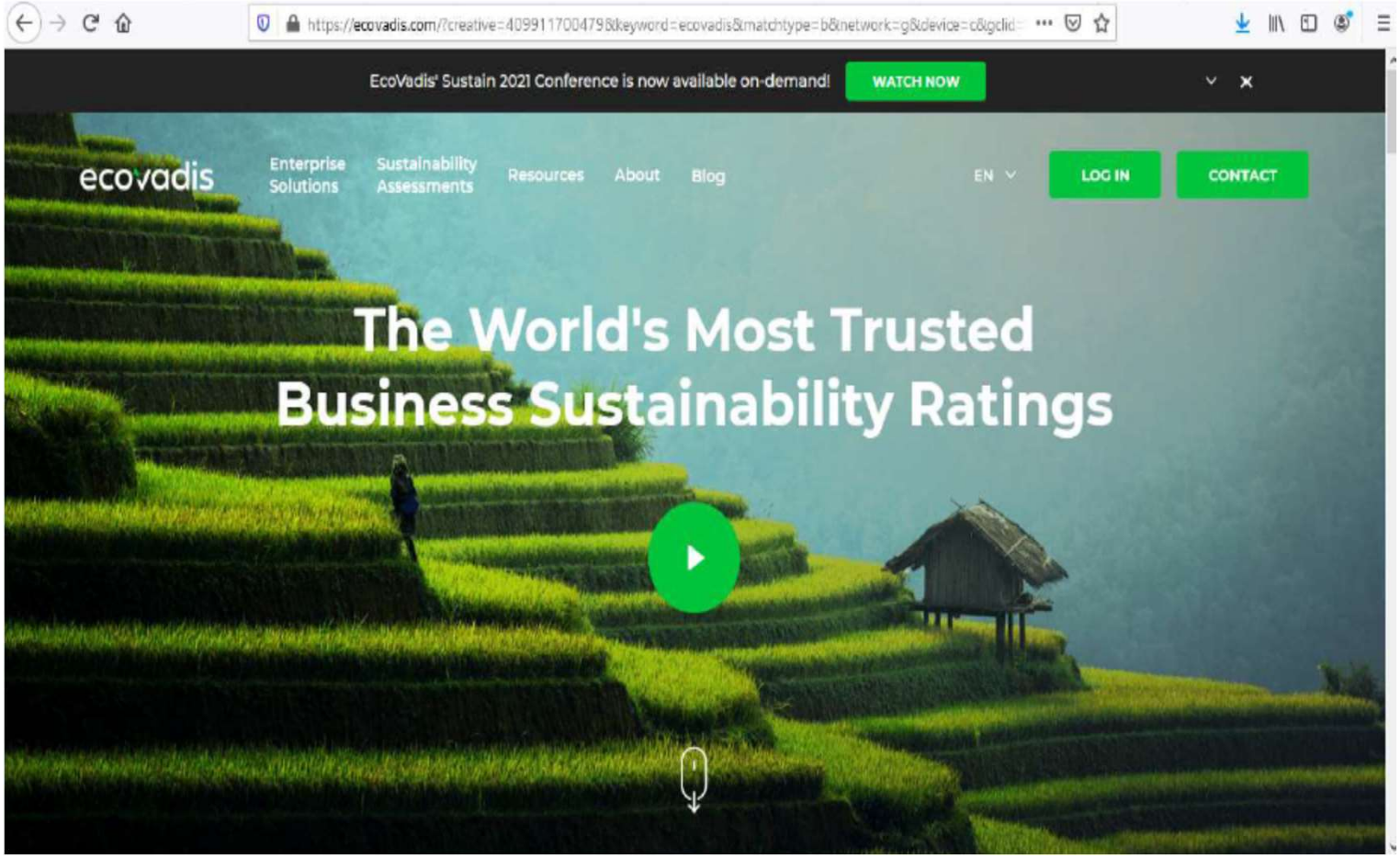
Practical Example of the ESG Strategy

Bayer client requested EcoVadis certification -
COPENOR Reached Silver Category



Governance Pillar

GOVERNANCE

Practical Example of the ESG Strategy

Social Pillar

COPENOR will commit to executing a Social Project, in the city of Camaçari, with resources linked to the Formol contract with its Clients

SOCIAL

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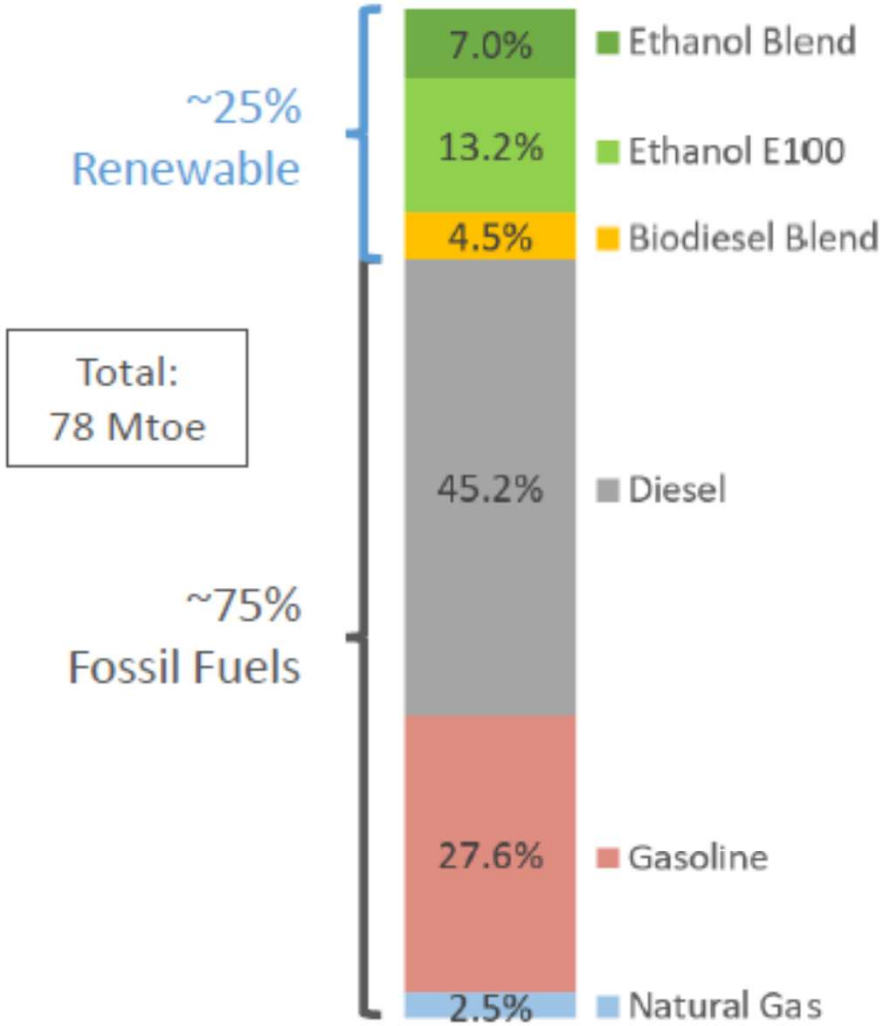
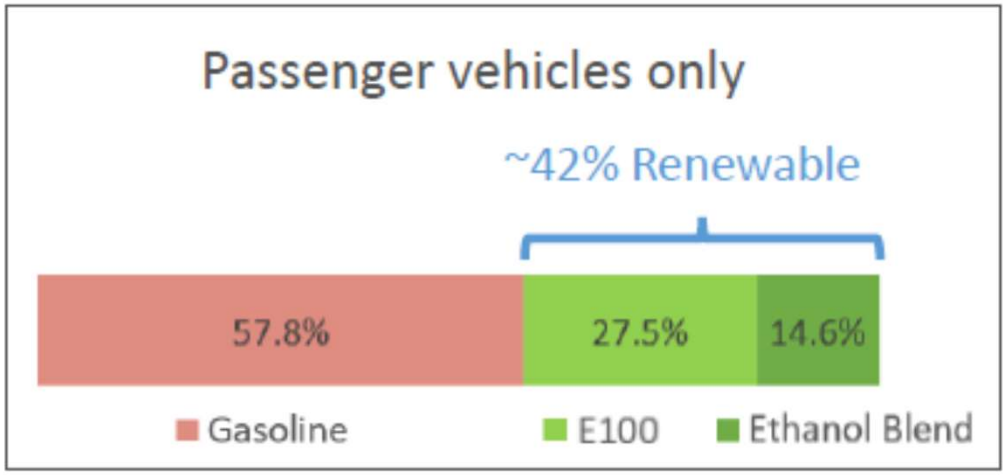
Scale of biofuels in Brazil: Road transport fuel mix





Road transport energy supply
Source: data from EPE (2019) – Year 2018

Source: PEN 5014 (Prof. Suani Coelho)

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RenovaBio Program

Launched in 2017 by Law 13.576 as the Brazilian National Biofuel Policy, RenovaBio aims:

- *promote GHG emission mitigation, in line with Brazilian targets set in COP21.*
- *foster bioenergy agroindustry, improving energy security and with positive impacts on income and jobs generation.*

RenovaBio

RenovaBio is founded on three pillars:

- *Annual decarbonization targets set by the government for a ten years period.*
- *Issuance of GHG emissions reduction certificates, named "CBio" (an acronym in Portuguese for Decarbonization Credit).*
- *Biofuels production emission evaluated through Life Cycle Analysis (LCA), as certified by qualifying agencies for each producer unit.*

Source: *FAPESP/UNICAMP Brazil (Prof. Luiz Horta Nogueira)*

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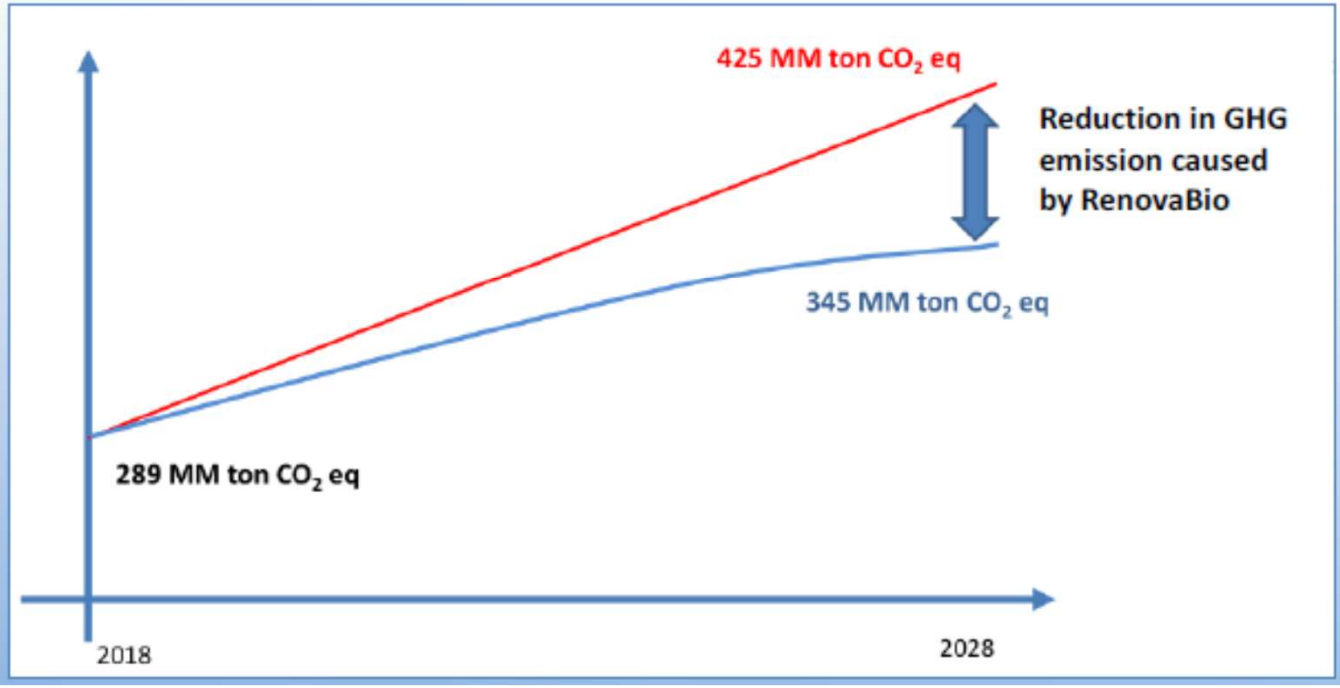
RenovaBio Program – Descarbonization Targets

Considering the Brazilian NDC in COP21 (-43% GHG emission) and all measures adopted for mitigating emissions, the National Council of Energy Policy set a target for the transport sector: to release less 80 million tonnes CO2eq in 2028.

This target was distributed in 10 years and shared among fossil fuels distributors, as a mandatory GHG emission compensation. It corresponds to decrease the average specific emission (carbon intensity) of energy used in transport from 73.5 to 69.0 gCO2eq/MJ between 2018 to 2028.



Projection of GHG emission from transport in Brazil (MME, 2018)

Source: *FAPESP/UNICAMP Brazil (Prof. Luiz Horta Nogueira)*

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RenovaBio Program – Highlights

- CBIO's will be generated by biofuel made just with biomass produced in land qualified as appropriate according to the Agroecological Zoning for sugarcane (ethanol) and and oil palm (biodiesel).
- Other government measures are in place to protect reserves, pristine areas, riparian forests, etc.

Considering the GHG mitigation target for 2020, circa 29 million CBIO's should be traded.
✓CBIO value will be eventually defined by the market, but estimates indicate ranges from 5 to 10 USD/CBIO.
✓Thus, RenovaBiowould inject between 145 to 290 million USD in Brazilian biofuels agroindustry in 2020.

✓For the next decade is estimated a total demand of 591 million CBIO's, which could generate until 2028 a revenue up to 5.9 billion USD.

Source: *FAPESP/UNICAMP Brazil (Prof. Luiz Horta Nogueira)*

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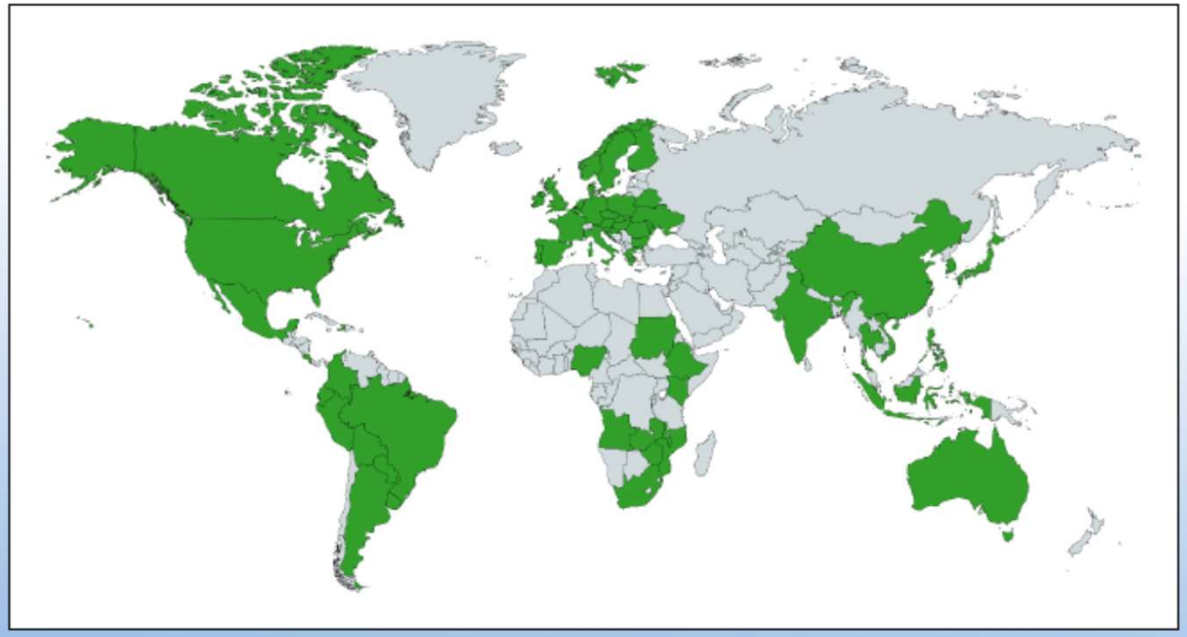
RenovaBio Program – Highlights

Biofuels use expands globally. Could RenovaBio concept be replicated?

Ethanol and biodiesel represent today about 4% of global energy consumption for transportation. Does RenovaBio scheme make sense for other countries?

Countries adopting biofuels blending mandates



(BiofuelsDigest, 2018)

Source: ***FAPESP/UNICAMP Brazil (Prof. Luiz Horta Nogueira)***

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MUITO OBRIGADO POR SUA ATENÇÂO