CPLC Americas Working Group Call
April 20, 2021, 11 am to 12:30 pm

COPENOR

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CEO – Metanor/Copenor
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
### Petrochemical Brazilian Industry Overview

<table>
<thead>
<tr>
<th>País</th>
<th>Vendas Líquidas*</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>1.361,1</td>
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<tr>
<td>EUA</td>
<td>564,9</td>
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<tr>
<td>Japão</td>
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<tr>
<td>Alemanha</td>
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<tr>
<td>Coréia</td>
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<td>BRASIL</td>
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<td>Índia</td>
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<tr>
<td>Rússia</td>
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<tr>
<td>França</td>
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<td>Taiwan</td>
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<tr>
<td>Itália</td>
<td>58,0</td>
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<tr>
<td>Holanda</td>
<td>55,0</td>
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</table>

- Does not include Pharmaceutical Products
Petrochemical Brazilian Industry Overview

Source: Abiquim
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

II - Import and Distribution of methanol
Import and Distribution of methanol

Chile - METANEX
6,000 t/mês (Port of Aratu)
- 25% for own consumption
- 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
"A picture is worth a thousand words"

Take son! I saved all that money for your future.
What should COPENOR's strategy be?
Elaboration of an Inventory of GHG Emissions

Environmental Pillar

<table>
<thead>
<tr>
<th>Escopo</th>
<th>Categoria da fonte</th>
<th>Atividade relacionada</th>
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<tbody>
<tr>
<td></td>
<td>Combustão móvel</td>
<td>Consumo de combustível fóssil em veículos de frota própria</td>
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<tr>
<td></td>
<td>Combustão Estacionária</td>
<td>Consumo de combustível fóssil em fontes estacionárias como geradores, caldeiras e equipamentos térmicos de processo</td>
</tr>
<tr>
<td></td>
<td>Emissões Fugitivas</td>
<td>Liberação intencional de CO₂ nas manutenção e recarga de extintores de incêndio na unidade e liberação não intencional do vazamento de gases de refrigeração tanto na área industrial quanto na área administrativa</td>
</tr>
<tr>
<td></td>
<td>Emissões de Processos</td>
<td>Proveniente do processo de calcinação de produtos, formando NOₓ</td>
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<tr>
<td></td>
<td>Tratamento de Resíduos gerados nas operações tratados internamente</td>
<td>Unidade de tratamento de resíduos gerados pelo processo industrial.</td>
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<tr>
<td></td>
<td>Efluentes</td>
<td>Tratamento de efluentes gerados pelo processo industrial</td>
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<td>Aquisição de Energia Elétrica</td>
<td>Utilização de energia elétrica proveniente do grid nacional de fornecimento, que possui impacto próprio na sua geração</td>
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<tr>
<td></td>
<td>Categoria 1 – Bens e Serviços Comprados</td>
<td>Emissões de GEE provenientes da produção de insumos industriais necessários</td>
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<td>Categoria 4 – Transporte e Distribuição (Upstream)</td>
<td>Consumo de combustíveis fósseis em veículos da frota terceirizada para transporte de insumos industriais</td>
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<td>Categoria 5 – Resíduos Gerados nas operações (Efluentes Sanitários)</td>
<td>Tratamento de resíduos sanitários tratados por empresas terceirizadas</td>
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<tr>
<td></td>
<td>Categoria 6 – Viagens a negócios</td>
<td>Viagens áreas de funcionários a serviço da empresa</td>
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<tr>
<td></td>
<td>Categoria 7 – Deslocamento de Funcionários (casa-trabalho)</td>
<td>Deslocação casa-trabalho de funcionários utilizando transporte fornecido pela empresa.</td>
</tr>
<tr>
<td></td>
<td>Categoria 9 – Transporte e Distribuição (Downstream)</td>
<td>Consumo de combustíveis fósseis em veículos da frota terceirizada para transporte dos produtos até os clientes.</td>
</tr>
<tr>
<td></td>
<td>Categoria 11 – Uso de bens e Serviços</td>
<td>Emissões de GEE provenientes do uso dos produtos nas unidades de corteamento catalítico dos clientes</td>
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<tr>
<td></td>
<td>Categoria 12 – Tratamento de fim de vida dos produtos vendidos</td>
<td>Emissões de GEE oriundos da disposição final de produtos já utilizados pelos clientes</td>
</tr>
<tr>
<td></td>
<td>Categoria 13 – Bens arrendados</td>
<td>Centros de distribuição logística de produtos perto de clientes</td>
</tr>
</tbody>
</table>

Menu de navegação da ferramenta de cálculo GHG Protocol. (Fonte: PROGRAMA BRASILEIRO GHG PROTOCOL, 2019)
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.
Bayer client requested EcoVadis certification - COPENOR Reached Silver Category
COPENOR will commit to executing a Social Project, in the city of Camaçari, with resources linked to the Formol contract with its Clients.
Scale of biofuels in Brazil: Road transport fuel mix

- ~25% Renewable
  - Ethanol Blend: 7.0%
  - Ethanol E100: 13.2%
  - Biodiesel Blend: 4.5%
  - Total: 78 Mtoe

- ~75% Fossil Fuels
  - Diesel: 45.2%
  - Gasoline: 27.6%
  - Natural Gas: 2.5%

Passenger vehicles only
- ~42% Renewable
  - Gasoline: 57.8%
  - E100: 27.5%
  - Ethanol Blend: 14.6%

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

Source: PEN 5014 (Prof. Suani Coelho)
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 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)
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.

Source: FAPESP/UNICAMP Brazil (Prof. Luiz Horta Nogueira)
- 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 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, RenovaBio would 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)
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)
MUITO OBRIGADO POR SUA ATENÇÃO