Bioenergy – The overlooked contributor to the 1.5°C climate objective

28th European Biomass Conference and Exhibition (EUBCE 2020)
9 July 2020 – 14.00-15.30 CEST

Good example on liquid biofuels for transportation - focus on emission reduction potentials

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e-EUBCE 2020, July 9, 2020

Research Group on Bioenergy/Institute of Energy and Environment
Research Center on Gas Innovation - RCGI - FAPESP-SHELL
UNIVERSITY OF SÃO PAULO - BRAZIL
Biofuels in Brazil

2019/2020 Sugarcane season

- 642.7 MM t cane
- Center-South: 590.4 MM t cane
- Sao Paulo State: 343.7 MM t cane
Scale of biofuels in Brazil: Road transport fuel mix

~25% Renewable

- 7.0% Ethanol Blend
- 13.2% Ethanol E100
- 4.5% Biodiesel Blend

~75% Fossil Fuels

- 45.2% Diesel
- 27.6% Gasoline
- 2.5% Natural Gas

Total: 78 Mtoe

Passenger vehicles only

~42% Renewable

- 57.8% Gasoline
- 27.5% E100
- 14.6% Ethanol Blend

Road transport energy supply
Source: data from EPE (2019) – Year 2018
GHG emissions avoided with gasoline replacement

<table>
<thead>
<tr>
<th>Feedstock</th>
<th>Avoided emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugarcane</td>
<td>61% to 82%</td>
</tr>
<tr>
<td>Corn</td>
<td>-30% to 38%</td>
</tr>
<tr>
<td>Wheat</td>
<td>19% to 47%</td>
</tr>
<tr>
<td>Sugar Beet</td>
<td>35% to 56%</td>
</tr>
<tr>
<td>Cassava</td>
<td>63%</td>
</tr>
<tr>
<td>Lignocellulosic residues*</td>
<td>66.5% to 73%</td>
</tr>
</tbody>
</table>

- UNICA (2010) - including iLUC - sugarcane ethanol has a reduction of GHG emissions of 73-82% compared with gasoline, on a 30- or 100-year time horizon, respectively.

- EPA’s calculations - sugarcane ethanol from Brazil reduces GHG emissions compared to gasoline by 61%, using a 30-year payback for iLUC emissions.


* In theory – technology under development
RenovaBio: incentive to reduce carbon footprint - available and new technologies

Carbon credits for biofuels based on lifecycle emissions reductions vs a fossil fuel

Credits purchased by fuel distributors based on CI reduction targets for the fuel supply

All biofuels: Ethanol, biodiesel, biomethane, HEFA-aviation, ...

Brazilian commitments at COP 21

2020 - Our new Project proposals at RCGI/FAPESP/SHELL - BECCS perspectives and impacts on RenovaBio
Biofuels producer

biofuels

Fuels distributor

Fuel stations

Regular fuels market
Accredited certifier

GHG Calculator → Data → Cl_{BIOFUEL} → Biofuels producer → Cl_{BIOFUEL} → Fuel distributor → Fuel stations

CBio = Decarbonisation credit (1 tCO_2e)

Regular fuels market with RenovaBio (a carbon price)

Brazil's fuel supply 10 year carbon intensity targets

CBio obligation
Impacts of COVID pandemic on biofuels*

- ↓ demand for fuels and ↓ oil prices: huge impact on biofuels
- In Brazil:
  - Ethanol demand ↓ by 50% (UNICA)
  - Ethanol prices ↓ by 35% (from 2.0 BRL down to 1.3 BRL)
  - Main difficulty is ethanol storage, as cane must be crushed
  - Only large groups have relevant storage capacity
  - Sugar production is an option only for industries with flexible process

- Special financing policies under discussion to face the crisis

Thanks!

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