

COGEN World Talks

First Global Market Report on Cogeneration

November 17th, 2022

Source: CWC



COGEN
WORLD COALITION

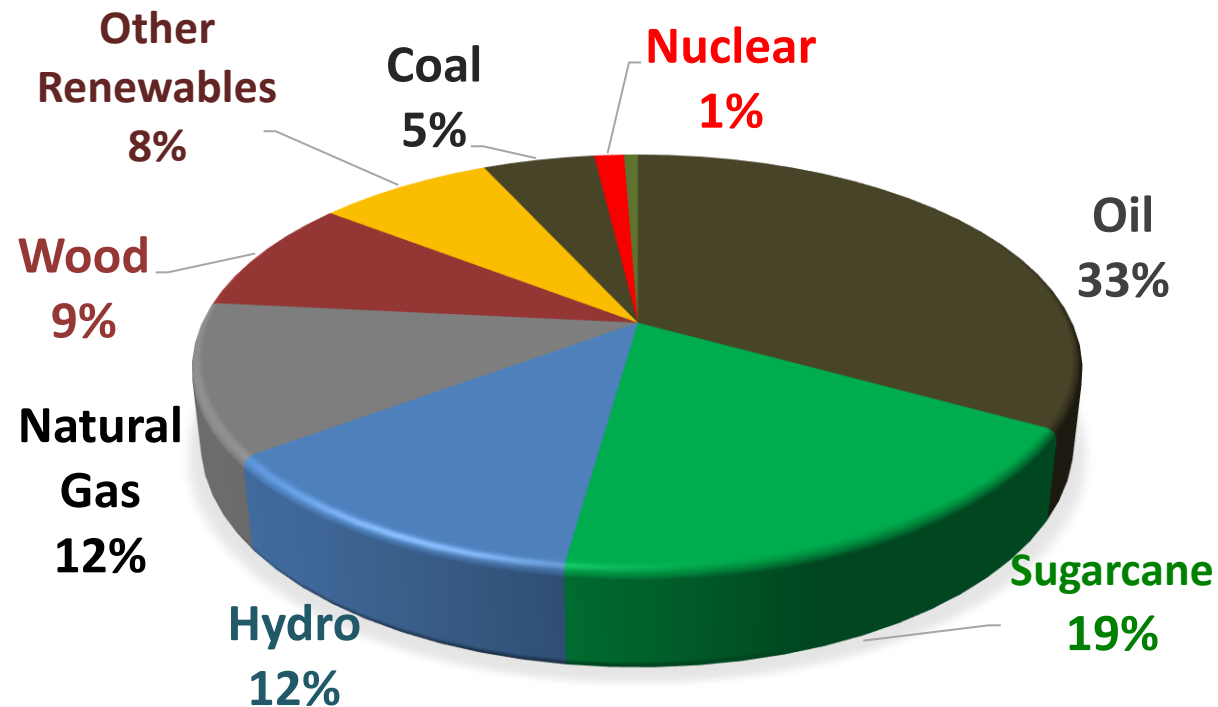
COGEN - Energy Cogeneration Industry Association



COGEN
Associação da Indústria
de Cogeração de Energia



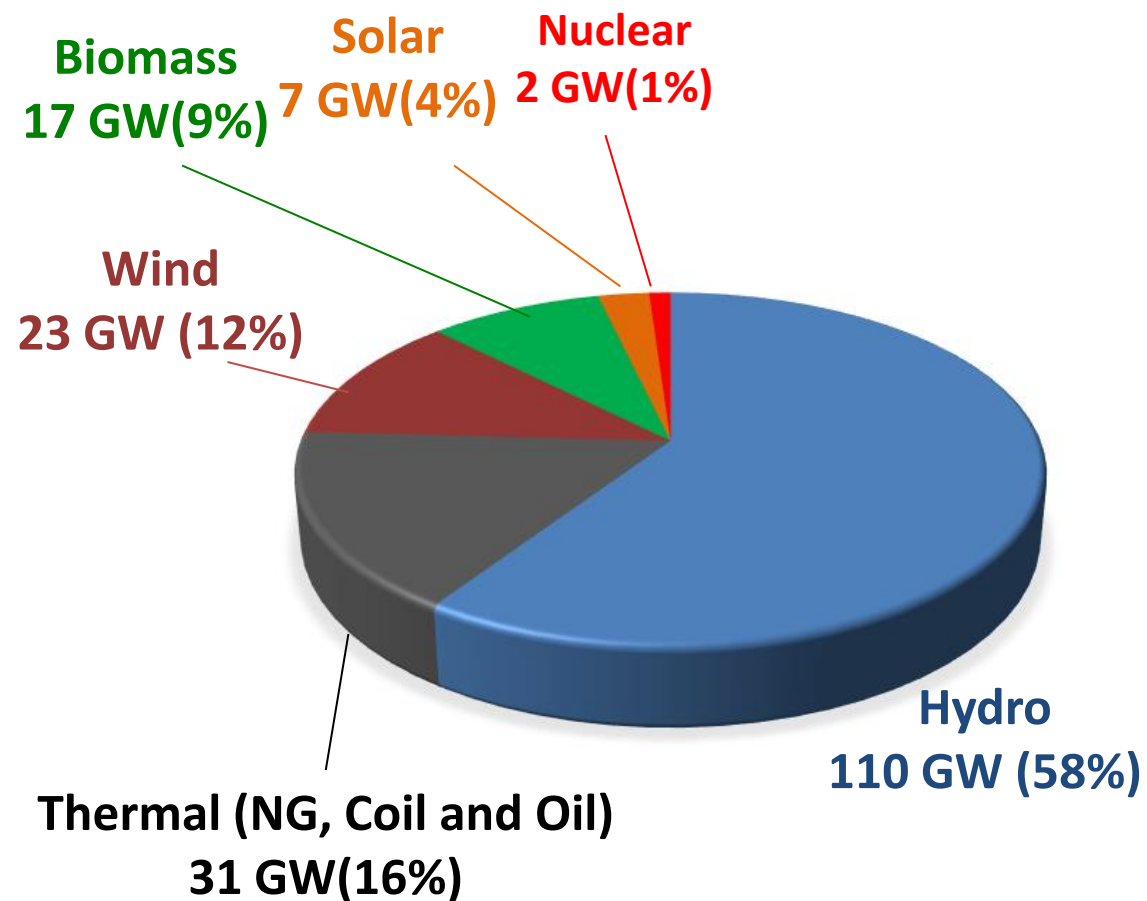
Brazilian Energy Matrix – ton of oil equivalent



Renewable	Non-Renewable
48%	52%

Source: [EPE](#)

Brazilian Electrical Matrix – 187 GW



Renewable	Non-Renewable
83%	17%

Source: [ANEEL](#)



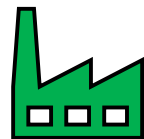
Cogeneration Evolution

20.3 GW <=> Approximately 10.9% of Brazil's Installed Capacity

Power Plants Installed Capacity (GW)

Cogeneration Evolution (GW)

Biomass



507



16.8

Natural Gas



93



3.2

Biogas



50



0.4

Centralized Solar



+220



6.7

Micro and Mini
DG



+1,400K



15.0

20

18

16

14

12

10

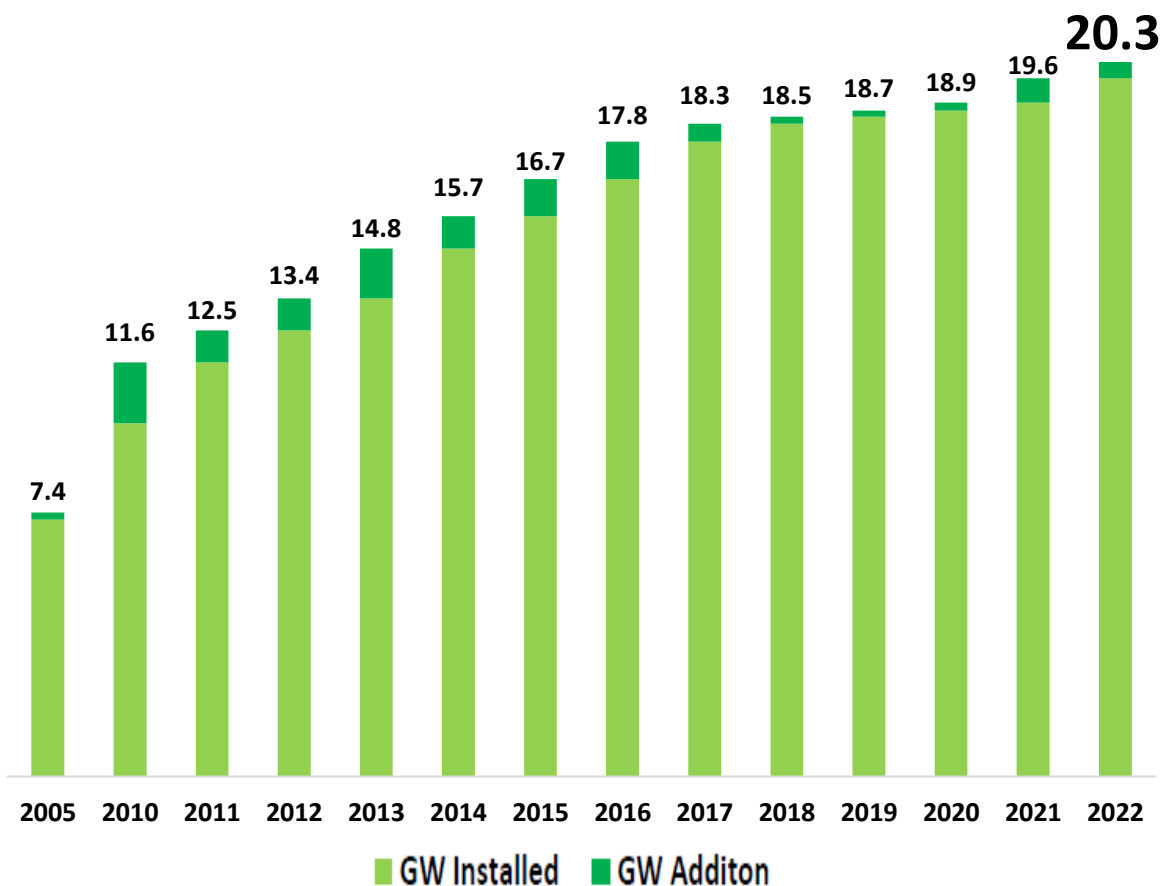
8

6

4

2

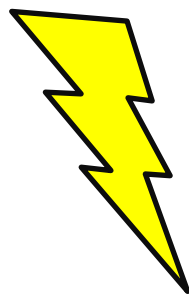
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Natural Gas - Cogeneration

Ebook COGEN – NG Cogeneration Potential

Theoretical Potential



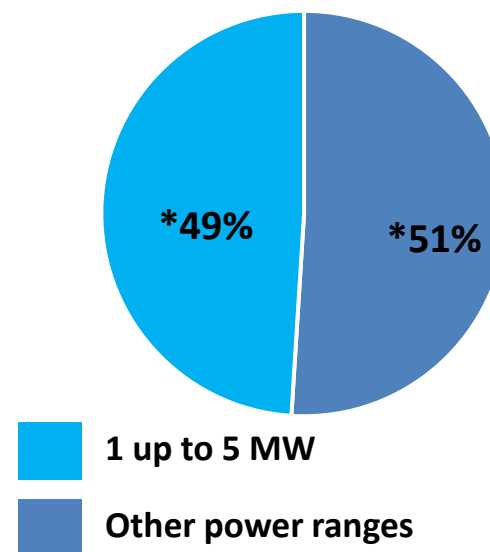
7.2 GWe



17.9 GWt

5,490 Power Plant Potential Projects

*Estimated percentages



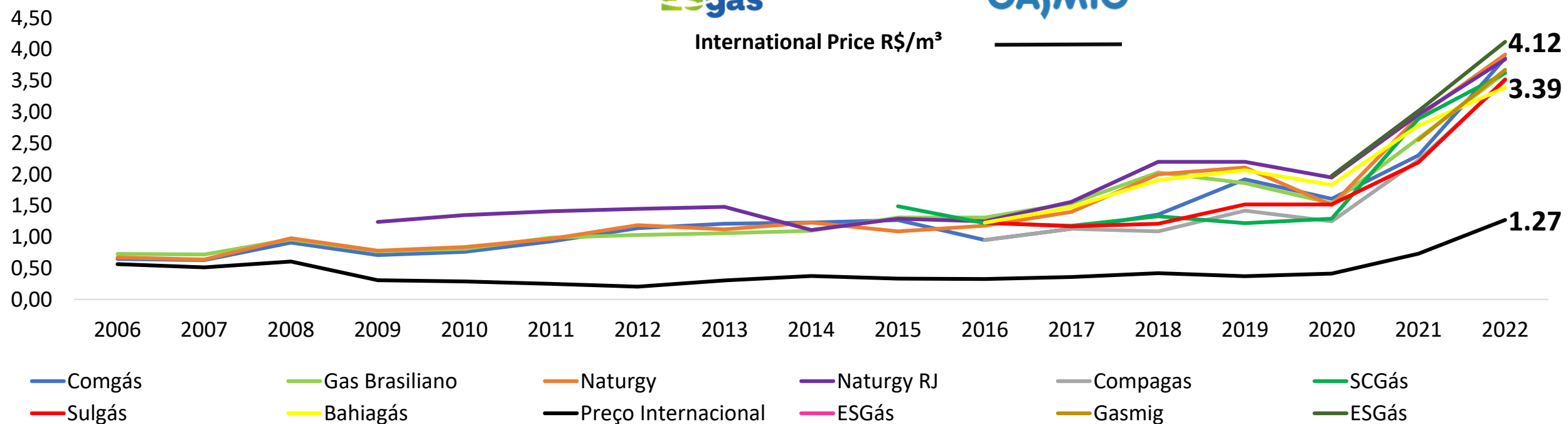
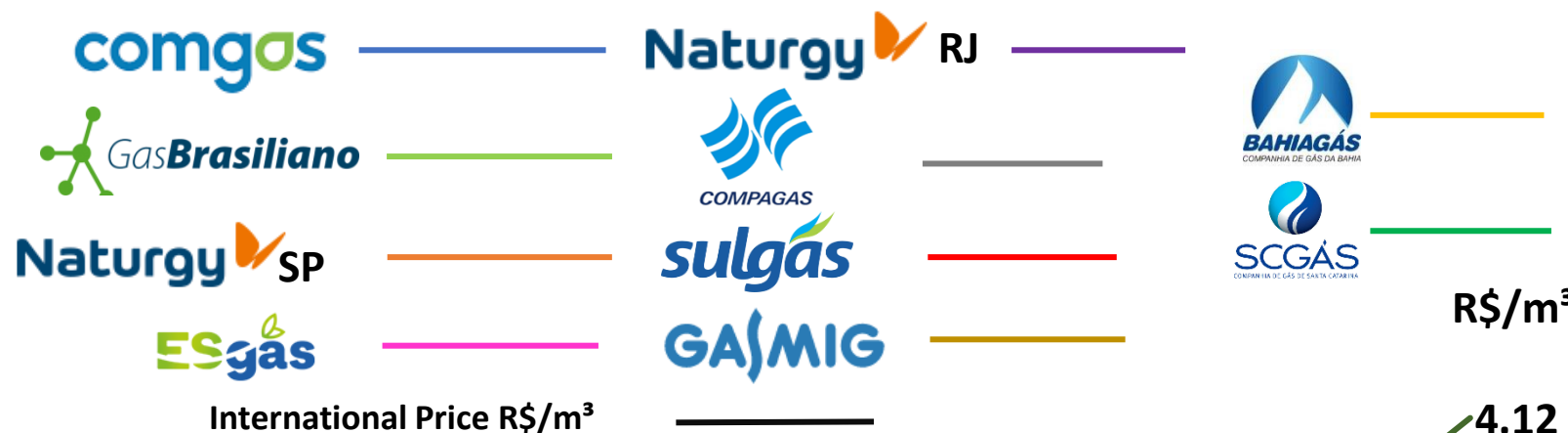
Natural Gas Cogeneration Benefits Simulator

Available in: www.simulador.cogen.com.br

Installed Actual Capacity: 3.15 GW

Cogen Sector – SP, RJ, MG, BA, ES states and South Region

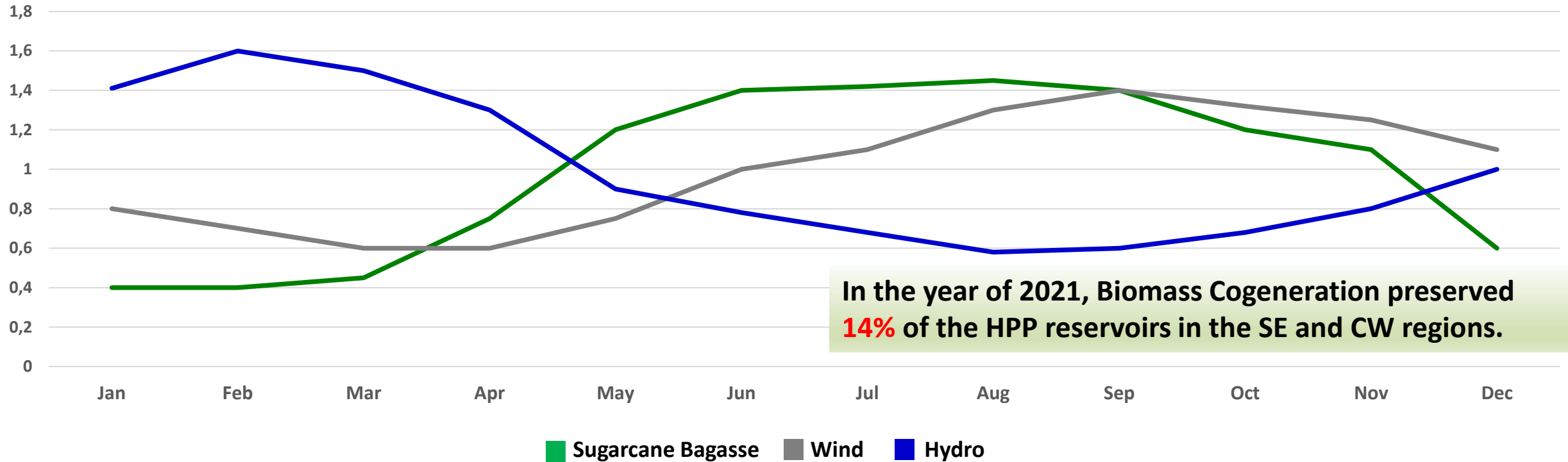
RS/m ³	USD/MMBTU (*)
1.27	6.62
3.39	17.67
4.12	21.48



* 1 U\$ = R\$ 5.14

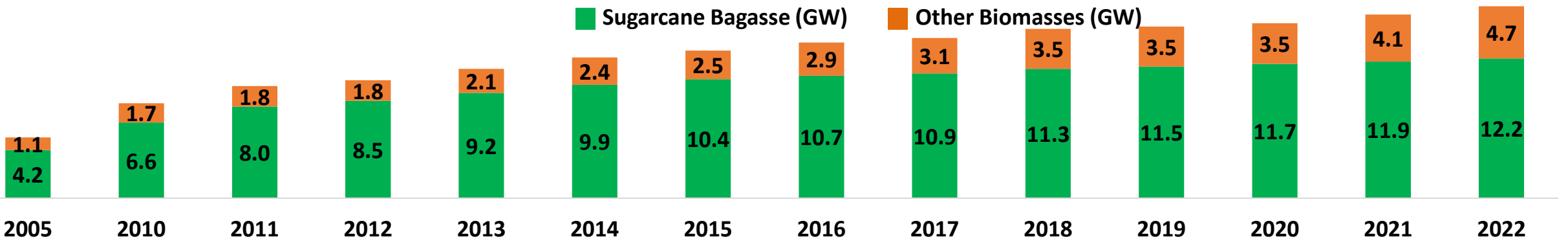
Biomass

p.u.



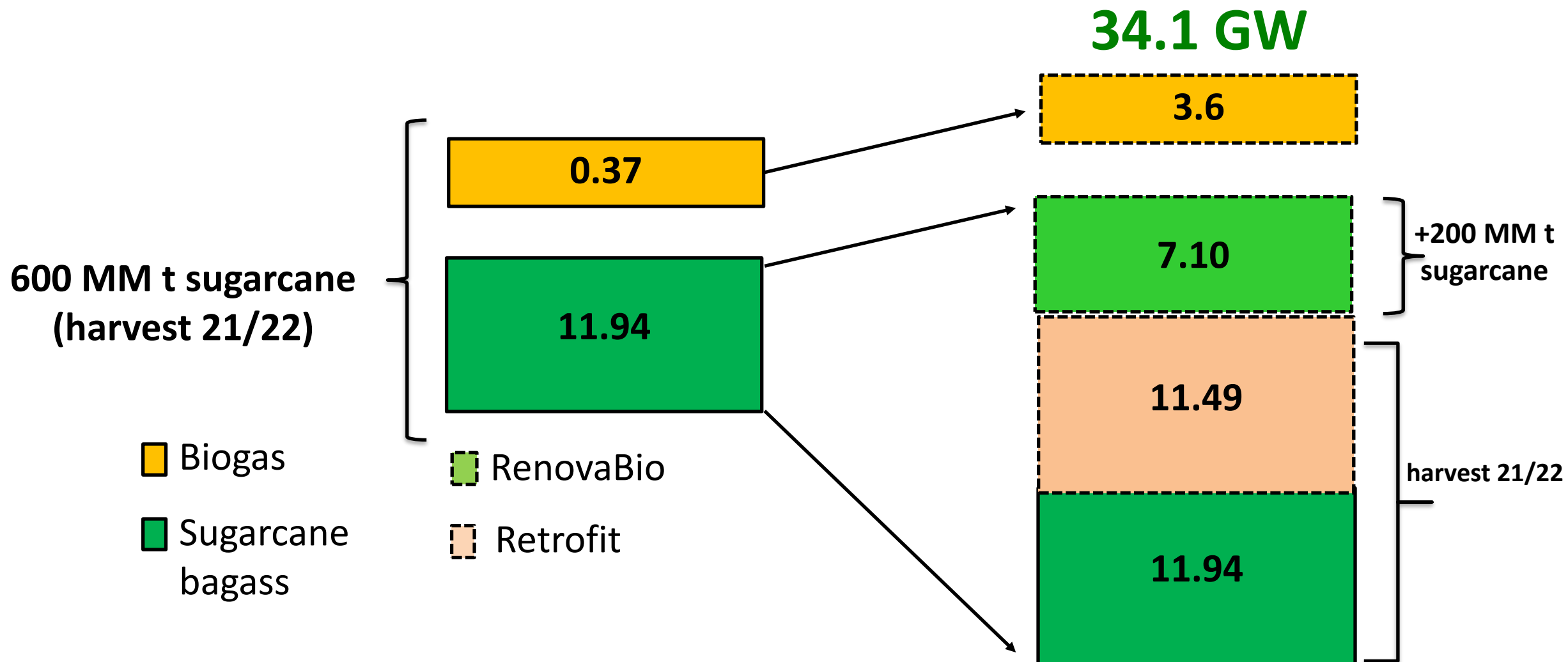
Reservoir Level SE/CO: **49%** in November 2022

16.8



S&E Bioelectricity Potential

2022 - 2025	Power Addition(GW)
Total	2.8 (0.7/year)



Bonfim - 21 MW - SP



Raízen - Bonfim Power Plant
(Guariba - SP)

**21 MW of Installed Capacity (5 MM Sugarcane
t/year)**

Vinasse	Filter Cake
17 MW	4 MW



+ 200 MM Sugarcane t/year
35 -> 50 bi Ethanol liters/year

**+3,6 GW of Installed Capacity (800 MM Sugarcane
t/year)**

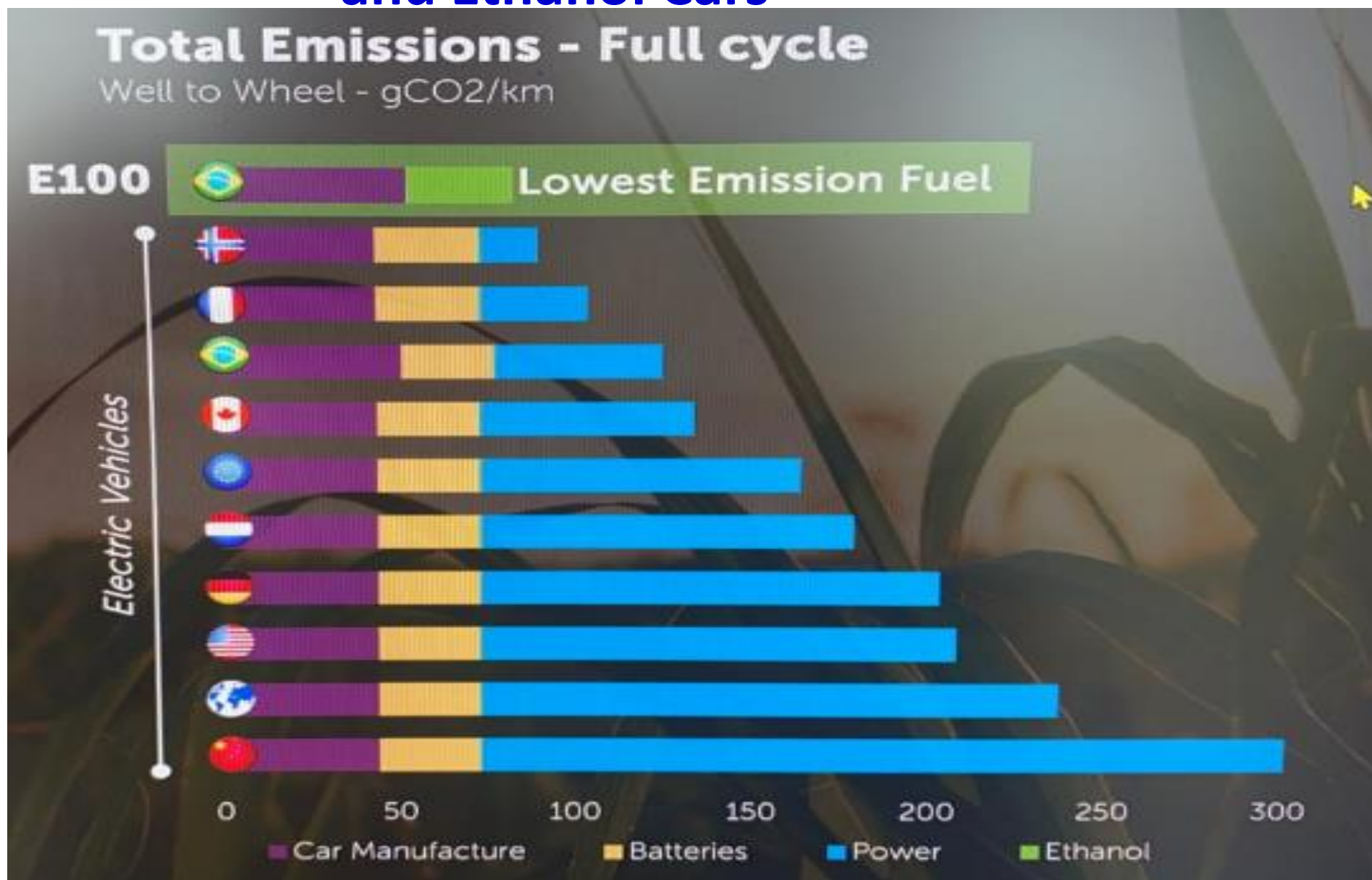
Vinasse	Filter Cake
2.9 GW	0.7 GW

Coopcana - 10 MW - PR

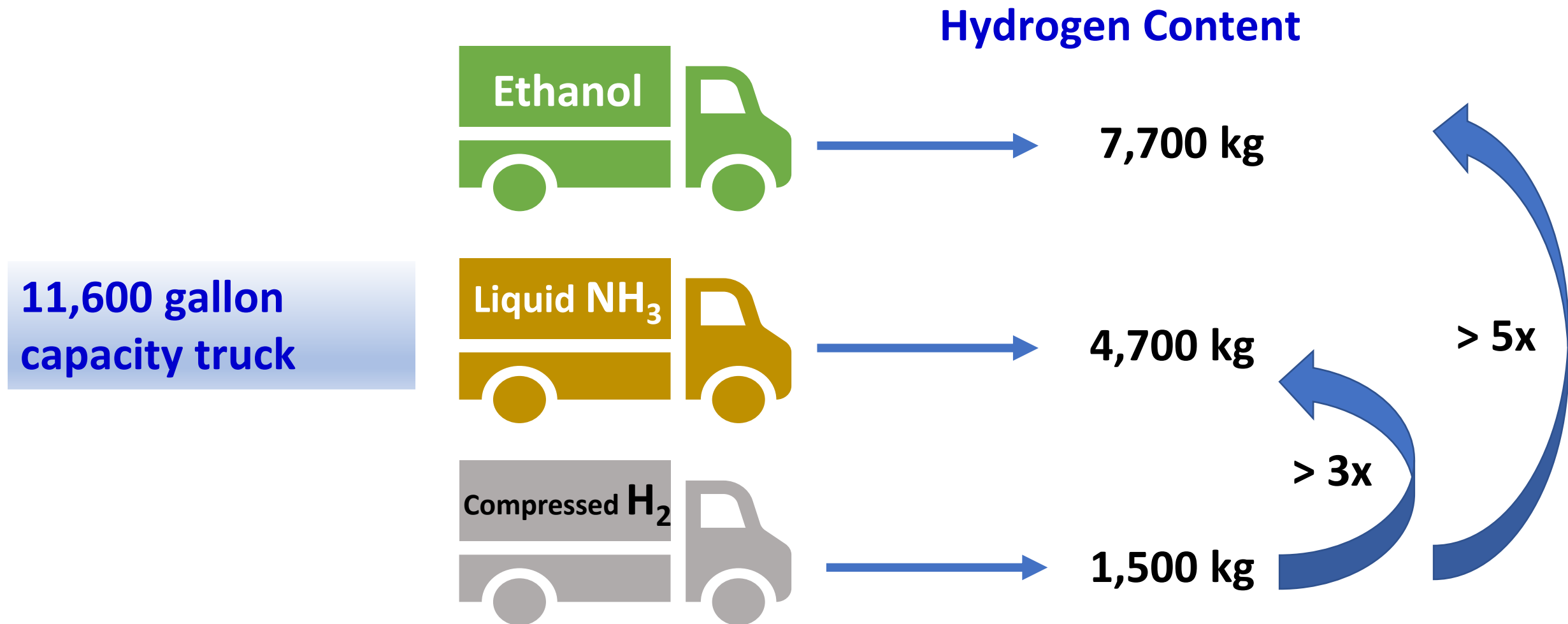


Biogas: 4th Product in the S&E Industry

CO₂ Total Emissions – Full Cycle – Electric and Ethanol Cars



H₂ Production Opportunities out of Ethanol



Biomass and Biogas Cogen Main Attributes

- **Power**
- **Resilience**
- **Inertia (GD2)**
- **Reliability and Distributed Gen**
- **Reduced voltage drop**

- **Lower GHG Emissions > Carbon Neutral**
- **Developed Industry**
- **Rural Development**

Sugar & Ethanol Opportunities

- 1. Fleet - Diesel substitution (S&E Mills - 670 MM gallons/year)**
- 2. Biomass Cogeneration (+ 18 GW Potential)**
- 3. Biogas Cogeneration (+ 3.2 GW Potential)**
- 4. Biomethane Swap – S&E Mills / NG Distributors (60 S&E Mills near pipelines in the SP state)**

Thank you

Newton José Leme Duarte

newton.duarte@cogen.com.br

+55-11-98117-3863