

Future Bioenergy Opportunities:

Emerging Markets in Brazil and Beyond

***A brief overview of the
Brazilian Biomethane Market***

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About me



Lucas D'avila

Business Development Coordinator | Biomethane
MDC Energia



Environmental Engineer



Master's degree Environmental Technology



MBA in Finance



Research background in biodigestion

About MDC

15+ years in the Brazilian biomethane market

- 1st biomethane plant in commercial scale
- 1st biomethane plant to inject biomethane into the gas grid
- 3 plants in operation and +3 under construction
- 40% of the Brazilian biomethane production in 2024



GNR DOIS ARCOS (2014)

Biomethane capacity: 18,000 m³/d
1st commercial plant in Brazil.



GNR FORTALEZA (2017)

Biomethane capacity: 110,000 m³/d
1st to inject into the gas grid.



ESSENCIS BIOMETANO (2024)

Biomethane capacity: 68,000 m³/d
Located in one of the biggest landfills in the world.

A brief history on Brazilian Biomethane



A brief history on Brazilian Biomethane

- 2014 - 1st commercial-scale biomethane plant in Brazil



GNR DOIS ARCOS

Biomethane capacity: 18,000 m³/d

SPV: MDC & Grupo Osafi

Location: Dois Arcos Landfill – Rio de Janeiro

Distribution: CNG

A brief history on Brazilian Biomethane

- **2014** - 1st commercial-scale biomethane plant in Brazil
- **2015** - ANP regulates the specification of biomethane from Agro Residues



anp
Agência Nacional
do Petróleo,
Gás Natural e Biocombustíveis



Resolução ANP nº 8/2015

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- **2017** - **ANP regulates the specification of biomethane from Landfill**



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Resolução ANP nº 685/2017

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GNR FORTALEZA

Biomethane capacity: 110,000 m³/d

SPV: MDC & Marquise Ambiental

Location: ASMOC Landfill – Ceará

Distribution: Pipeline

A brief history on Brazilian Biomethane

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- **2020 - RenovaBio Program was fully implemented**



Brazil's National Biofuels Policy, created to expand the production of biofuels such as ethanol, biodiesel and biomethane.

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- **2022** - 1st transaction of guarantees of origin of biomethane



Valor Econômico

<https://valor.globo.com> > noticia > 2023/03/20 > mdc-e...

MDC e Marquise fecham venda de Gas-REC para a Heineken

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- **2024** - **Creation of the Fuel of the Future Law**



Brazil approved the Fuel of the Future law, a mandate that includes biomethane.

Starting in 2026, natural gas producers and importers must buy physical molecules or Guarantees of Origin, with the required volume increasing year by year, stimulating demand.

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- **2020** - RenovaBio Program was fully implemented
- **2022** – 1st transaction of guarantees of origin of biomethane
- **2024** - Creation of the Fuel of the Future Law
- **2025** – Brazil is set to reach 1.000.000 m³/day of installed capacity

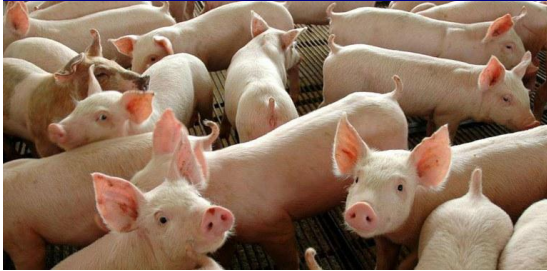


The paradox of biomethane sources

Industrial



Agriculture



Sanitation

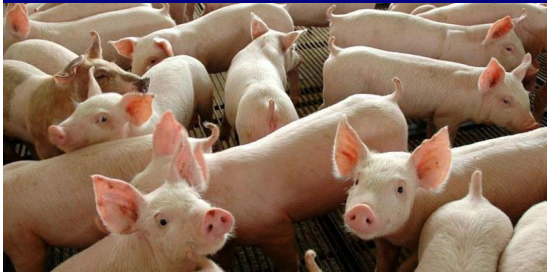


The paradox of biomethane sources

Industrial (50%)



Agriculture (44%)



Sanitation (6%)



Theoretical potential

**42 Billion
m³/year**

The paradox of biomethane sources



Theoretical potential

**42 Billion
 m^3/year**

Real production

**74 Million
 m^3/year**

(ANP, 2024)

The paradox of biomethane sources



Theoretical potential

**42 Billion
 m^3/year**

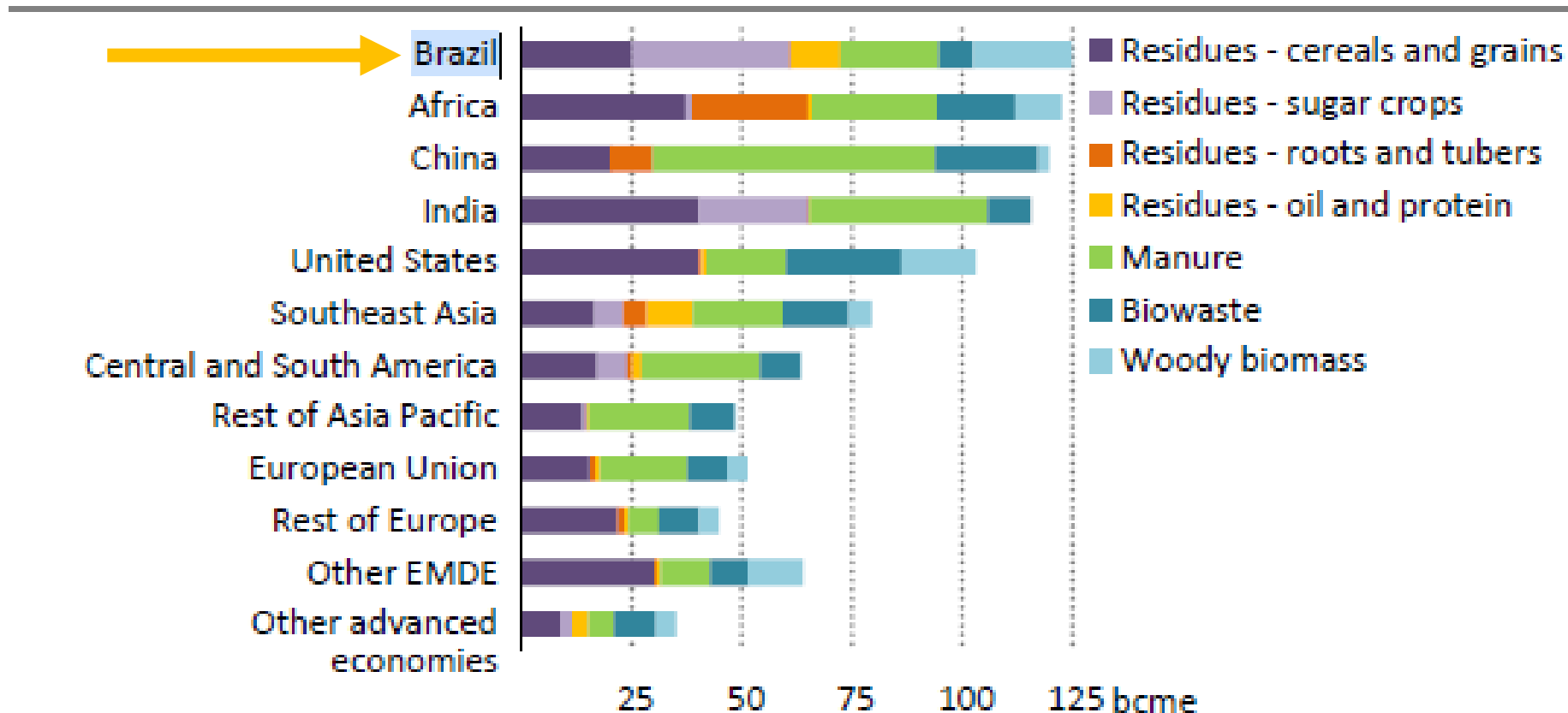
Real production

**74 Million
 m^3/year**

*97% of the 2024 biomethane production
came from landfill biogas (ANP, 2024)*

The paradox of biomethane sources

Figure 2.4 ▶ Potential for biogases by region and by feedstock type, 2024



IEA. CC BY 4.0.

Brazil, China, India and the United States together account for nearly half of the world's potential for biogases while representing only 23% of the global land surface.

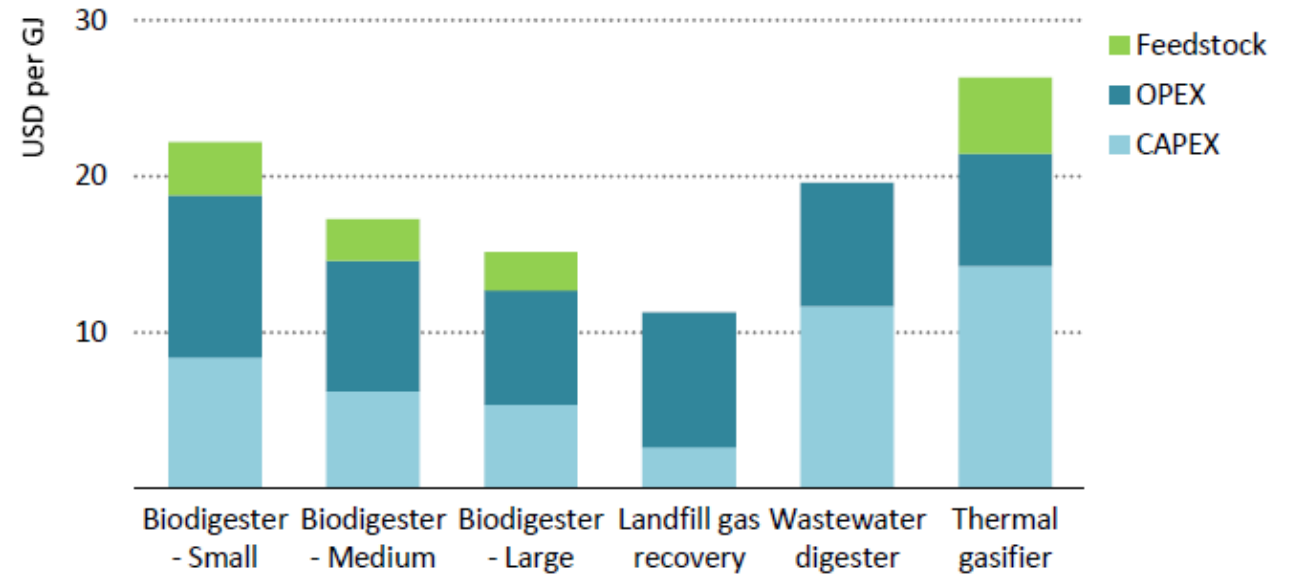
What are the challenges for scaling up biomethane?

What are the challenges for scaling up biomethane?



Scale

Figure 2.5 ▶ Total average estimated costs of producing biomethane by technology



What are the challenges for scaling up biomethane?

 **Scale**

 **Seasonality**



~200 days of harvesting season

What are the challenges for scaling up biomethane?



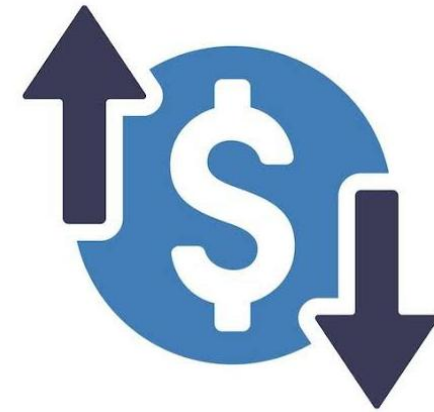
Scale



Seasonality



Achievable price



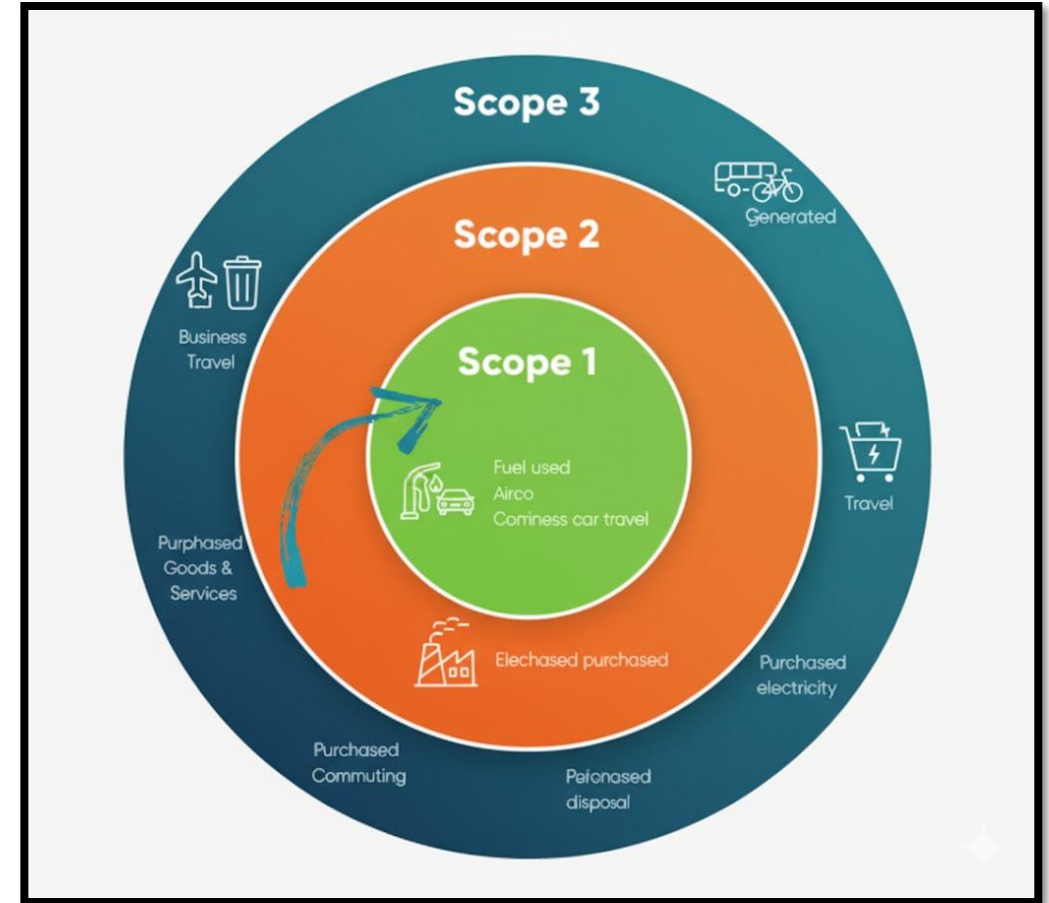
What are the challenges for scaling up biomethane?

 Scale

 Seasonality

 Achievable price

 **GHG Protocol**



What are the challenges for scaling up biomethane?



Scale



Seasonality



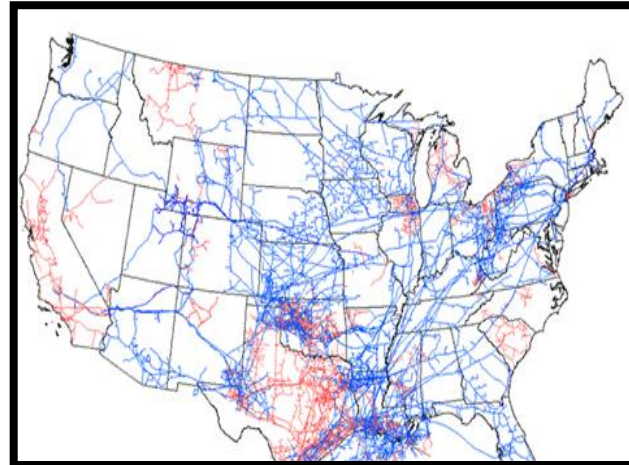
Achievable price



GHG Protocol



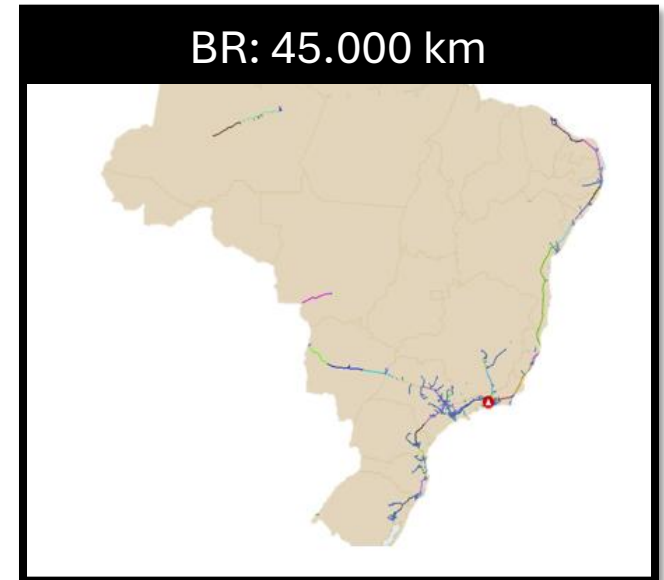
Distribution infrastructure



USA: 4.828.032 km



EU: 2.200.000 km



BR: 45.000 km

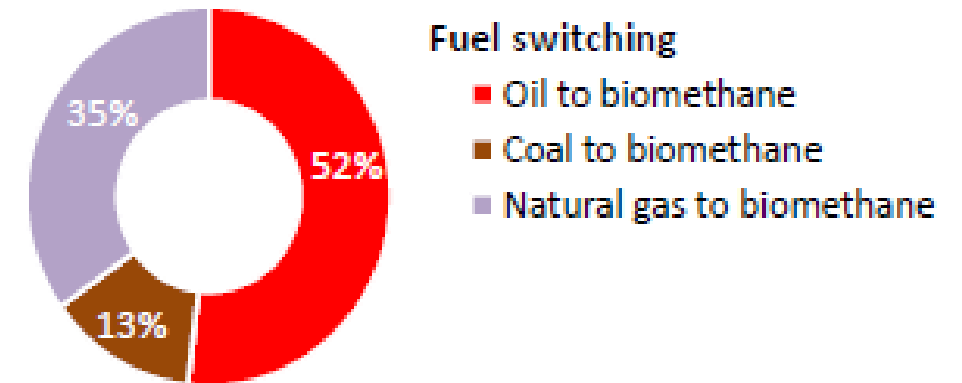
Climate Commitments and Public Policies

Brazil has recognized how strategic the biogas and biomethane is for achieving its NDCs under the Paris Agreement.

Synergies with governmental programs:

- PLANARES *[Waste Management]*
- PLANARO *[Recovery of Organic Residues]*
- Plano ABC+ *[Sustainability in Agriculture]*
- SBCE *[Regulated Carbon Market]*

Use of biomethane in advanced economies:



Source: Outlook for Biogas and Biomethane (IEA, 2025)

These frameworks shall be transformed into legal and regulatory structures to give confidence to companies that want to invest in this sector.

Local production, global decarbonization

80% of the world potential for biogas is in Brazil, India and China*

International book & claim systems could enable global climate benefits



“The world is round — emissions anywhere affect everywhere”

The background of the slide is a photograph of an industrial facility, likely a refinery or chemical plant. It features several tall, silver, cylindrical distillation columns with ladders and platforms. A complex network of orange-painted pipes runs across the ground and connects various pieces of equipment. In the foreground, there are large, grey, cylindrical storage tanks. The sky is blue with some white clouds. The image is partially obscured by dark blue and light blue geometric shapes that serve as a design overlay.

Thank you!

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