



# 13º Fórum do **BIOGÁS**

O ponto de encontro  
internacional de investidores  
em **BIOGÁS** e **BIOMETANO**

## **Air pollution control in biogas to Biomethane processing**

By Joachim Uwe Lorenzen

**DÜRR CTS  
Brazil Ltda.**



# Clean Technology Systems<sup>1</sup> at a glance

With six decades of global experience, Clean Technology Systems are leading experts for air pollution control, noise abatement and decentralized power generation.



**€0.407 bn**  
revenue



**1,300**  
employees



**16** locations in  
**12** countries

We provide state-of-the-art and custom-engineered solutions for key industries, such as chemicals, surface treatment, automotive, power generation, oil & gas and many more.

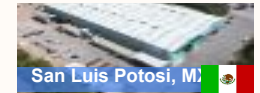
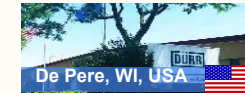
<sup>1</sup> Figures from 2024



## Global presence – close to our customers



## Manufacturing facilities



**>45,000**

Sqm of dedicated  
manufacturing floorspace

## R&D centers



Dedicated R&D experts,  
focused on new product  
opportunities



# Prepared to master every challenge

## Multi-pollutant emissions control

DÜRR CTS



VOCs/CO/HAPs/  
Odor



Particulate  
matter acid mists



Acid gases



Liquid solvents



Temperature  
control



Heat recovery

We combine our **technical expertise** with **global availability** to support our customers throughout the world, offering **solutions for multiple pollutants – from a single-source.**

Let us manage your  
environmental  
compliance,  
so you can stay  
focused  
on your business.



ABiogás

# Air pollution control

## Key segments and products

### Innovative solutions for major industrial sectors and applications



Chemicals



Automotive



Surface  
treatment



Biomethane



Odor control



Further  
applications

# DÜRR CTS

## Our product portfolio

### Thermal oxidizers – Oxi.X

- Regenerative thermal oxidizers (RTO)
- Recuperative thermal oxidizers
- Direct-fired thermal oxidizers

### Sorptive processes – Sorp.X

- VOC concentration
- Evaporative gas cooling
- Solvent recovery systems
- Biogas purification

### Particulate control – Part.X

- Wet and Dry Electrostatic Precipitators (ESP)
- Wet scrubbers
- Venturi scrubbers

### Catalytic control

- Catalytic candle filters
- Selective catalytic reduction
- High- and low-pressure catalytics
- Regenerative catalytic oxidizer



ABiogás

# Greener Biomethane and Greener Energy with

DÜRR CTS

- The Oxi.X process:
- Organic substances in process exhaust gases are combusted (oxidized) at temperatures high enough for the hydrocarbons in these gases to combine with oxygen and produce mainly water vapor and carbon dioxide. Oxidation is the most efficient air purification process for the disposal of combustible organic pollutants.
- More than 60 applications on Biomass and Landfill applications in Europe
- DRE > 99% (mandatory (CETESB): DRE > 97%)

## Product range:

- |             |                               |
|-------------|-------------------------------|
| ▪ Oxi.X RTO | Regenerative Thermal Oxidizer |
| ▪ Oxi.X RV  | Flameless electrical Oxidizer |
| ▪ Oxi.X TR  | Recuperative Thermal Oxidizer |
| ▪ Oxi.X DF  | Direct Fired Thermal Oxidizer |



OXI.X RTO



OXI.X RV



OXI.X DF



# Silence Biomethane application with

DÜRR CTS

- The Universal noise reduction solutions:

For Gas turbine application

- **Inlet air** Air inlet noise reduction and filtration
- **Exhaust air** Noise reduction - Stacks



For stationary Gas engine generators

- **Enclosures** Noise abatement and air management enclosures
- **Exhaust air** exhaust gas silencers and Nox reduction



# Energy recovery with Cyplan® ORC solutions

DÜRR CTS

## Biochar Waste heat electrification

|                  |                                                                           |
|------------------|---------------------------------------------------------------------------|
| Model:           | • <b>Cyplan®</b> ORC 120 HT CHP                                           |
| Heat source:     | • Exhaust gas from pyrolysis process                                      |
| Heat extraction: | • Hot water up to 95 °C                                                   |
| Location:        | • Grevesmühlen, Germany                                                   |
| Special aspects: | • First plant in this arrangement                                         |
| Benefits:        | • 100% more CO <sub>2</sub> -free power generated than entire plant needs |



## Wood chips Waste heat electrification

|                  |                                                         |
|------------------|---------------------------------------------------------|
| Model:           | • <b>Cyplan®</b> ORC 350 HT CHP                         |
| Heat source:     | • Biomass furnace (thermal oil)                         |
| Heat extraction: | • Hot water at 90 °C                                    |
| Location:        | • Ilanz, Switzerland<br>• Heat-driven operation regime  |
| Special aspects: | • Summer (low partial load) and winter operation (full) |
| Benefits:        | • Electricity and heat production                       |

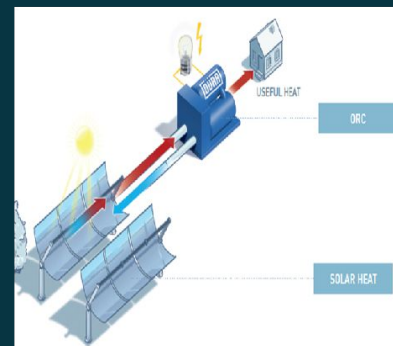


## Biogas engine Waste heat electrification

|                  |                                                        |
|------------------|--------------------------------------------------------|
| Model:           | • <b>Cyplan®</b> ORC 120 HT CHP                        |
| Heat source:     | • 2x 2G Avus 500 Plus (Flue gas)                       |
| Heat extraction: | • Hot water at 80°                                     |
| Location:        | • Jühnde, Germany                                      |
| Special aspects: | • Two engines for one ORC                              |
| Benefits:        | • 2,5 years amortization,<br>• Income from heat supply |



## Solar heat electrification

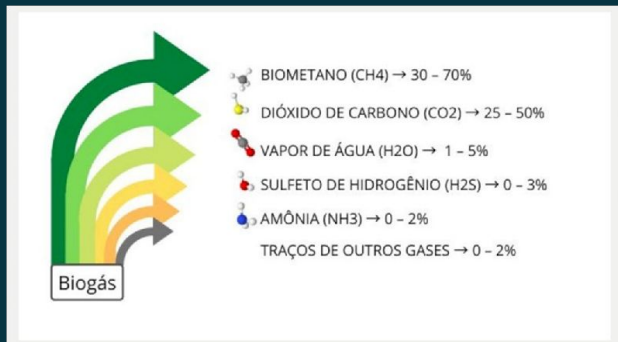


Solar thermal  
Project Universidade São Paulo  
Cyplan® ORC 70 HT



# How green is Biomethane in Brazil?

DÜRR CTS



Methan Losses in Tailgas

Approx. 113,08 million  $\text{m}^3$ /year

1,028 units Tailgas  
/Losses 11% Methane

In  $\text{CO}_2$  equivalentes:  
Approx. 2,827 Billion  $\text{m}^3$ /year or  
5,59 Billion kg/year

This corresponds in approx.:  
3,1 Million cars running for  
15.000km/ year

Seems worth treating  
and reducing

Biogas production potencial  
in Brasil (Abrema):  
Approx. 2,11 billions  $\text{m}^3$ /year

2,028 Biogas units  
50% Methane

Biogas to Biomethane Upgrade technology  
Efficiency varies from process to process  
Common Technologies:  
Water scrubbing  
PSA/TSA  
Membrane technology  
combinations

1 BIOMethane Unit  
>90% Methane

Attending  
ANP N°886

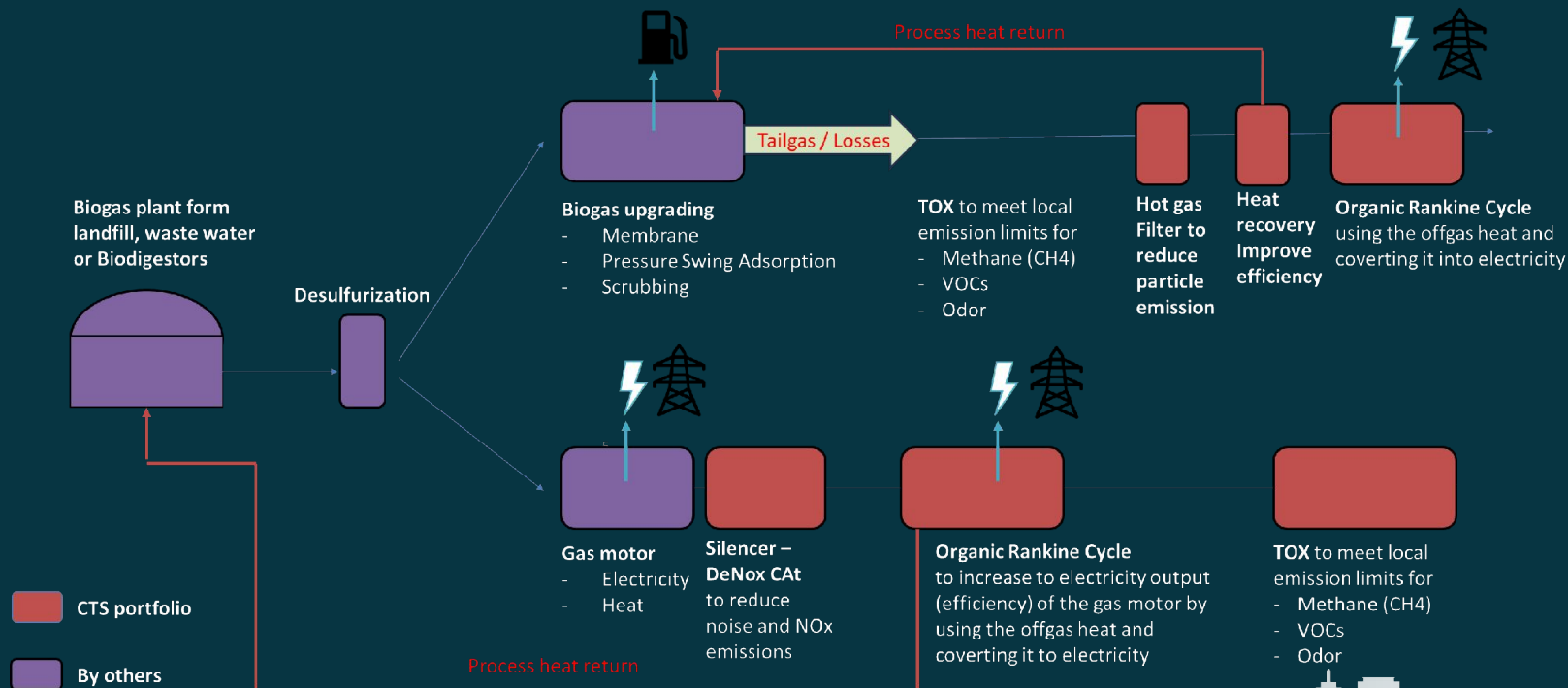
Biomethane production  
potencial in Brasil (Abrema):  
Approx. 1,04 billions  $\text{m}^3$ /year

ABREMA: Potencial Production from **Landfill waste** in Brazil: 1 Billion  $\text{m}^3$ /year



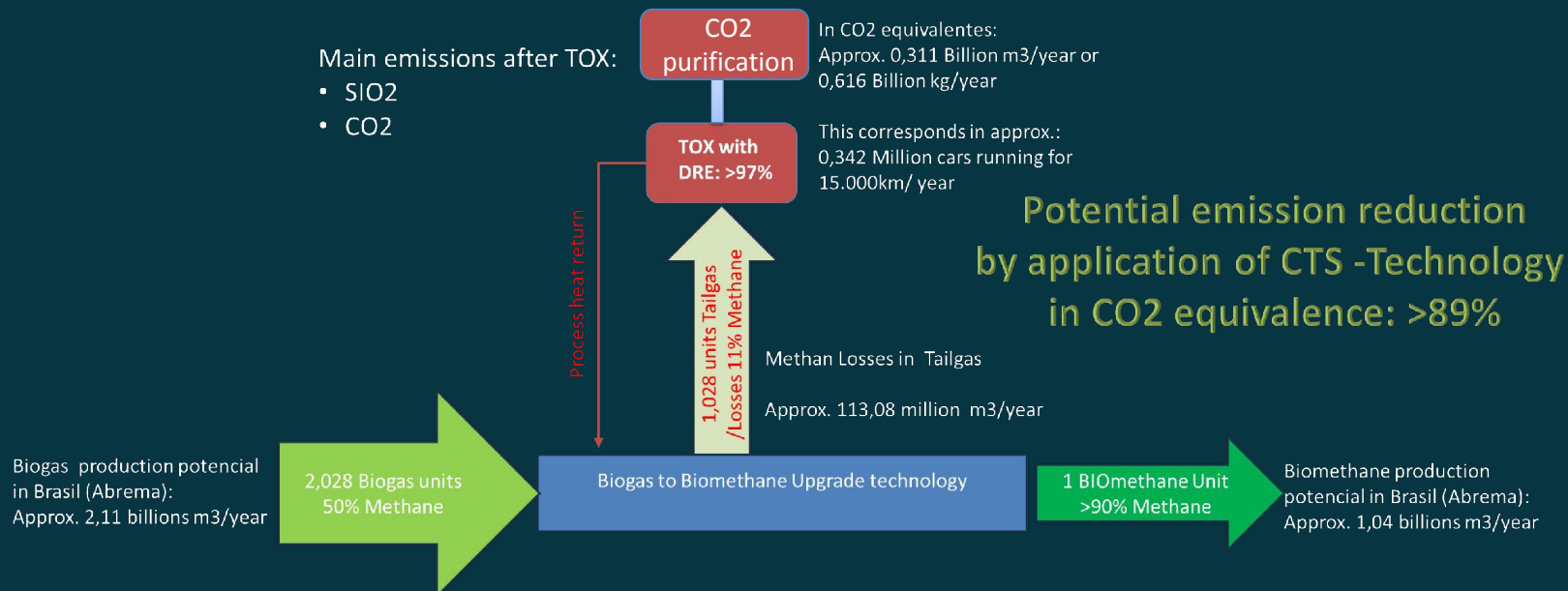
# Greener Biomethane and Greener Energy with

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# Greener Biomethane and Greener Energy with

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ABREMA: Potencial Production from **Landfill waste** in Brazil: 1 Billion m<sup>3</sup>/year



Thanks for your attention !



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