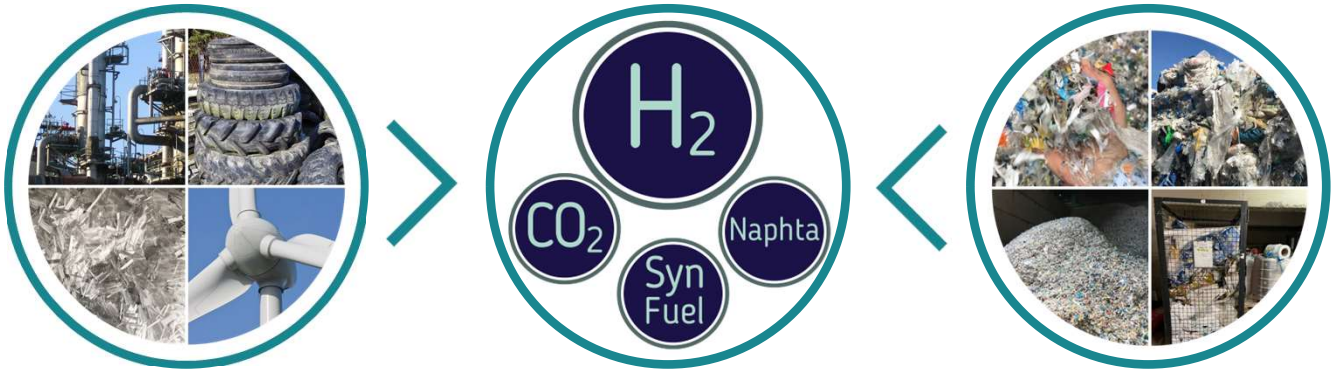
ambra

Wir schließen Kreisläufe

Waste to Hydrogen

A thermo-chemical production of H_2



Snapshot

- Founded in 1989
- Subsidiaries in the Netherlands, Mexico, Guadeloupe & Qatar
- Proprietary waste treatment technology: Faber-Ambra® system

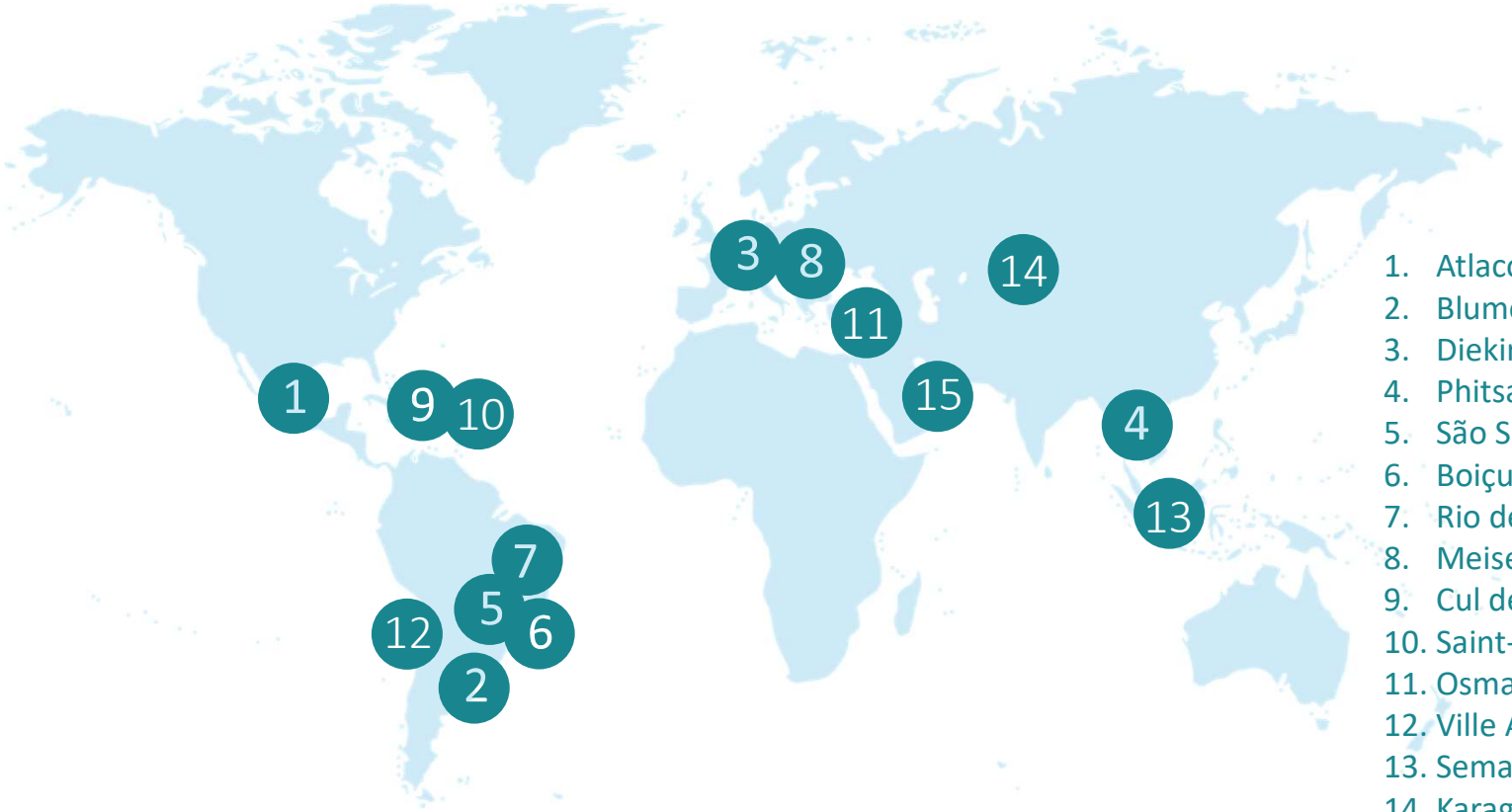
- A circular solution to climate protection, marine litter mitigation, use of secondary resources & generation of renewable energy

- More than 30 years of international experience promoting sustainable waste management for public & private sector

- Applying collected experience & know-how to environmentally friendly production of circular H_2 / liquid CO_2 with modular and consolidated technologies and a sustainable energy balance

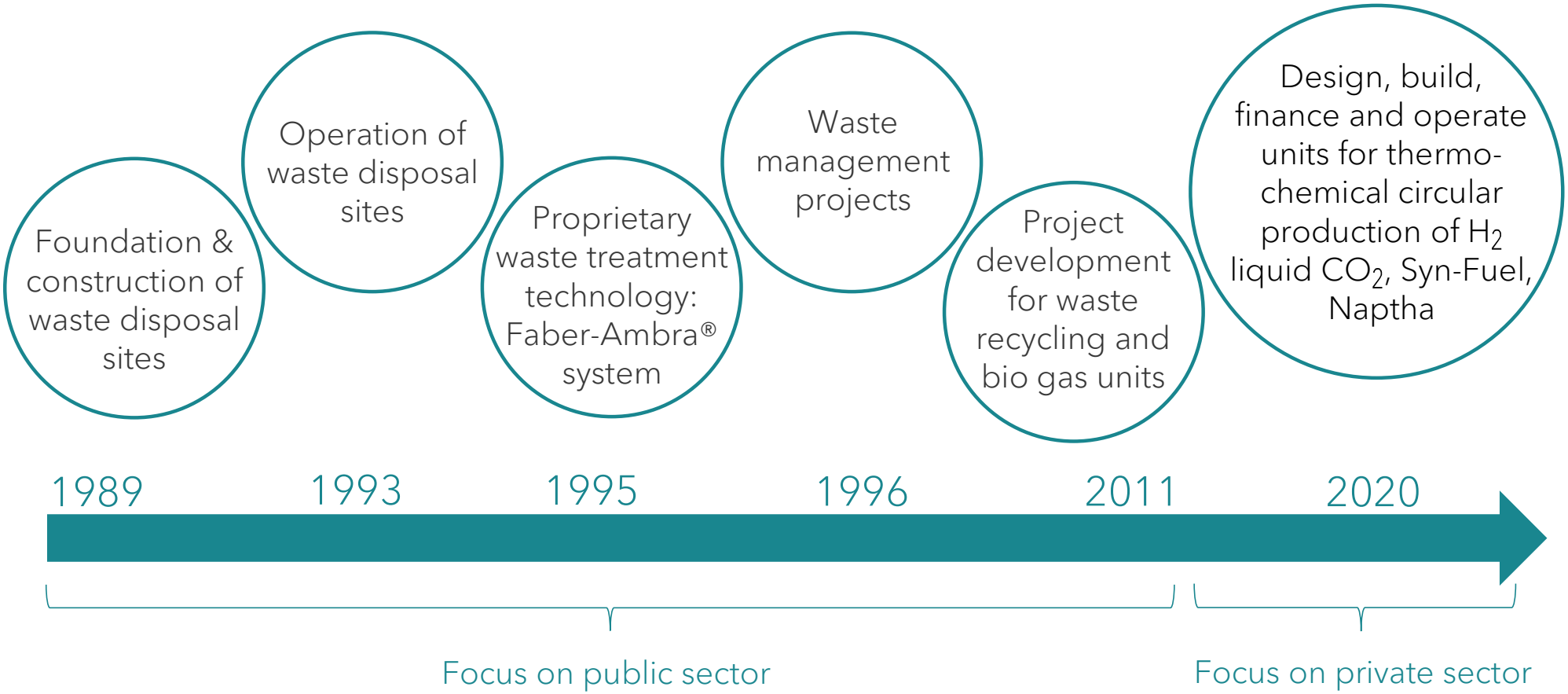
Track record worldwide

Waste management projects around the globe



1. Atlacomulco, Mexico
2. Blumenau, Brazil
3. Diekirch, Luxemburg
4. Phitsanulok, Thailand
5. São Sebastião, Brazil
6. Boiçucanga, Brazil
7. Rio de Janeiro, Brazil
8. Meisenheim, Germany
9. Cul de Sac, Saint Martin
10. Saint-François, Guadeloupe
11. Osmaniye, Turkey
12. Ville Alemana, Chile
13. Semarang, Indonesia
14. Karaganda, Kazakhstan
15. Doha, Qatar

Company history



Ambra® :
Aerobe **M**echanische **B**iologische **R**est **A**bfallbehandlung /
aerobic mechanical biological residual waste treatment

Key Strenghts

Competence

More than 25 years experience in water & waste management
Strong experience in project management
Recognizing new potential

Networks

International government institutions, public universities, non-governmental organizations.

TÜV-certified companies & financial partners

References

Municipalities in Asia, Europe, Latin America, the Caribbean & South America
Cement industry & worldwide pilot Projects

Cooperations

Technology partners in gasification, pyrolysis & plasma processes, waste to energy/water, biogas, refuse derived fuel, marine litter mitigation, clean development mechanism & decontamination of oil-contaminated soil &water

Global challenges

- Increasing amounts of waste with growing prosperity
- CO_2 from fossil incineration must be avoided
- More than 50% of plastic waste in Gemany is incinerated
- Waste as secondary raw material is not utilized
- EU legislation dictates recycling of all waste including plastic
- Sustainable waste management to mitigate climate change & marine litter necessary

Problem to solution

- Waste is an important secondary resource

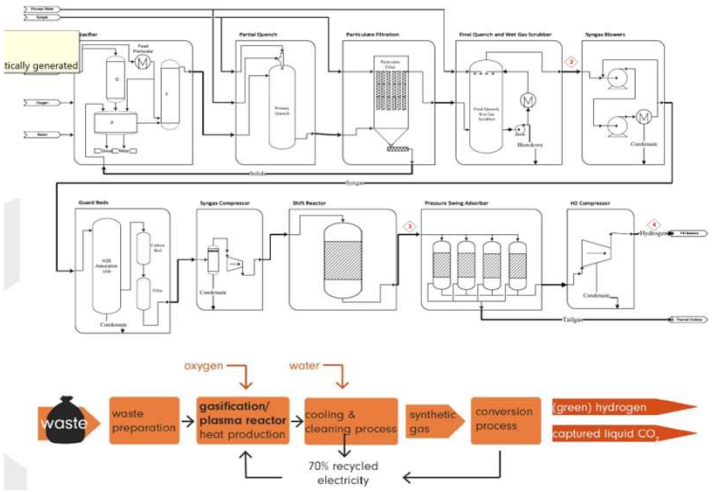
- Producing energy in a circular manner & avoiding additional CO2 emissions

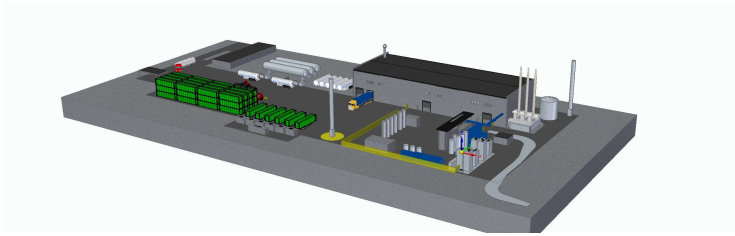
- Closing life cycle through production of new products – thus improving the climate balance
- H2 as substitute for any fossile produced energy
- CO2 with > 99,9% quality for food industry etc.

- SynFuel as replacement for standard gasoline
- Naphta as an important raw material in several chemical industry processes, such as the production of laundry soaps, cleaning fluids and many other applications

Combining pyrolysis & plasma technology in one chemical plant

- Allows an operation independent from external energy resources
- Proven technology, never failed a source test
- Using synergies – such as TEL-gas - between both production streams in the most holistic way
- Using „waste“ as base for new products, reducing incineration and therefore the amount of CO_2 released into the atmosphere





Plasma process
production of H_2 & liquid CO_2

We utilize the potential of industrial waste employing state of the art & safe technology

- Proven, tested & certified plasma production process
- Temperature window 1,500 to 5,000°C
- Waste is split into its existing contents
- We produce hydrogen & liquid carbon dioxide as valuable materials & energy carriers
- Hydrogen and carbon dioxide are produced in a circular manner

Input material
plasma technology

All high caloric, solid & liquid waste
such as:

- non-recyclable plastic, foils, etc.
- petrochemical industry waste
- chemical industry waste
- pharmaceutical industry waste
- wind power composite rotor blades
- combustible waste automotive sector (car shredding)
- tire waste
- contaminated water, etc.

Output products
plasma technology

We process

approx.
35,000 t/a input material
(industrial waste etc.)

We produce

H_2 + CO_2

approx.
5,100 t hydrogen
(circular production from waste)

approx.
33,000 t liquid carbon dioxide
(for use in the food industry)

(ICSSEU: Greenhouse gas reduction)

We only accept clearly defined types of waste, according to the requirements of the EU Directive 2000/532/.

Pyrolysis process
production of SynFuel & Naphta

We utilize the potential of non-recyclable plastic waste employing state of the art & safe technology

- Patented pyrolysis process, installed & in operation at various locations
- Converting plastic waste into:
- 55% Synthetic fuel (SynFuel) to Euro norm
- 45% Recirculat (Naphta) substituting raw material in the oil and chemical industry
- Ratio between SynFuel and Naphta can be adjusted within the production process according to market situation

Input material
pyrolysis technology

All non-recyclable waste such as:
(EU codes)

- 15 01 02 plastic packaging
- 16 01 19 plastic material
- 19 12 04 plastic material
- 19 12 10 combustible waste
- 19 12 10 miscellaneous waste
  (incl. mixed material)
  from the mechanical
  pretreatment
- 19 12 12 mechanical sorting waste

Output products
pyrolysis technology

We process

approx.
30,000 t/a plastic waste
HDPE, LDPE, PP and PS

We produce

Syn Fuel

approx.
12 mil. l/a SynFuel

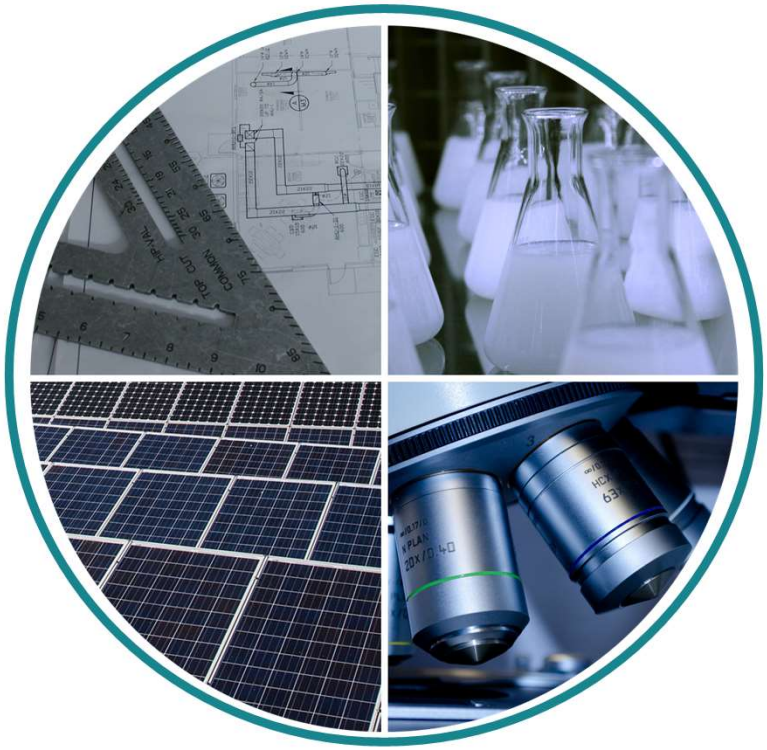
+ Naphta

approx.
8 mil. l/a Naphta
(for use in the food industry)

ICSS-EU: RFNBO (renewable fuels of non-biological origin)

Our partners

- AMBRA has well-known and very experienced industrial partners for the implementation of the entire project.
- We have a proven and reliable EPC contractor with a long and prestigious track record
- Our partner is accredited and respected as an EPC by Ambra's financial partners.



Partnerships (examples)

ambra
Wir schließen Kreisläufe

circular energy solutions

SYS TEAM BAU

Allianz

WOLFTANK GROUP

ROTH International

HiCE

References

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