ASU, Spec gas & ECO-ORIGIN

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Simon James
Name & function • Department

INDUSTRIAL MERCHANT

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Introduction

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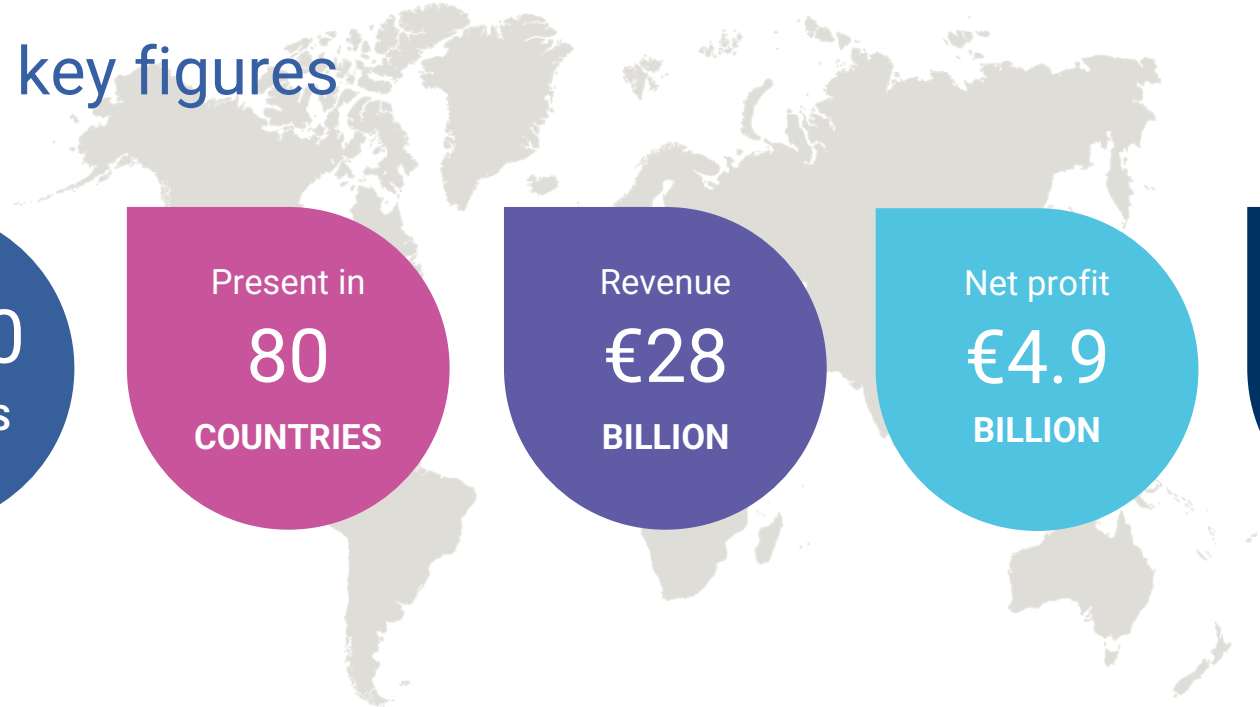
The world leader in gases, technologies and services for Industry and Health

2023 key figures



67,700
EMPLOYEES

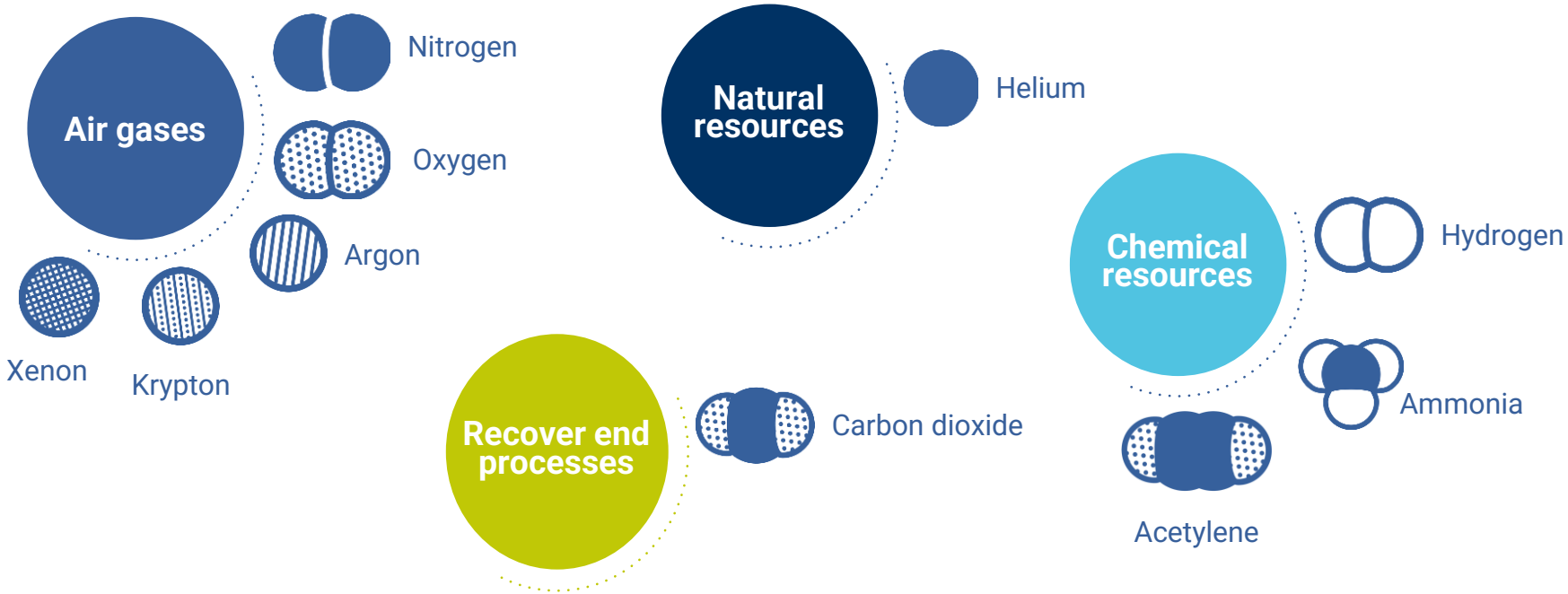
Present in
80
COUNTRIES

Revenue
€28
BILLION

Net profit
€4.9
BILLION

More than
4 MILLION
CUSTOMERS & PATIENTS

We explore the properties the gas molecules offer



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Air Separation Fundamentals

Coleshill ASU Overview

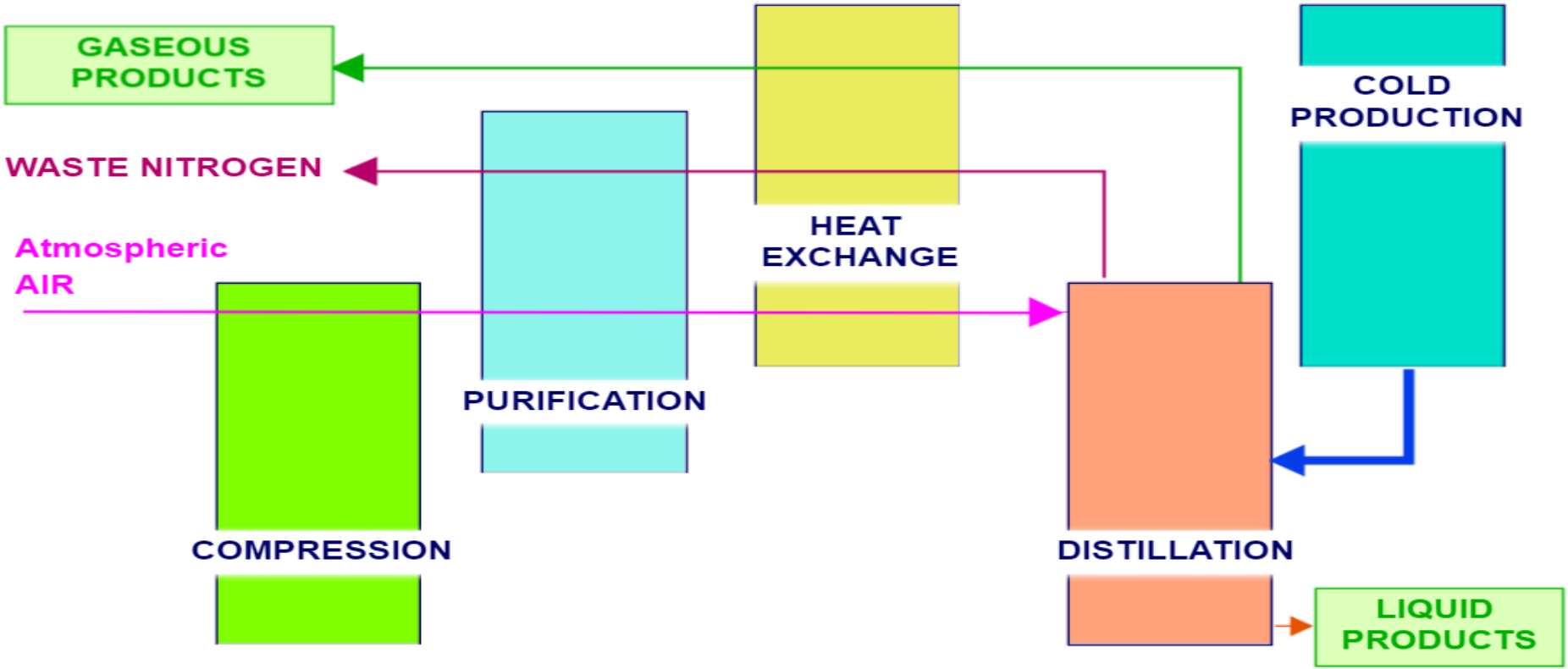
Composition of Atmospheric Air

ELEMENTS	SYMBOL	COMPOSITION IN VOLUME
OXYGEN	O_2	20.9 %
NITROGEN	N_2	78.1 %
ARGON	Ar	0.93 %
HELIUM	He	5.24 ppm
NEON	Ne	18.18 ppm
KRYPTON	Kr	1.139 ppm
XENON	Xe	0.086 ppm
HYDROGEN	H_2	0.5 ppm
WATER	H_2O	variable
CARBON DIOXIDE	CO_2	300 to 700 ppm
HYDROCARBONS	CH_4	3 to 5 ppm
	C_2+	< 0.5 ppm

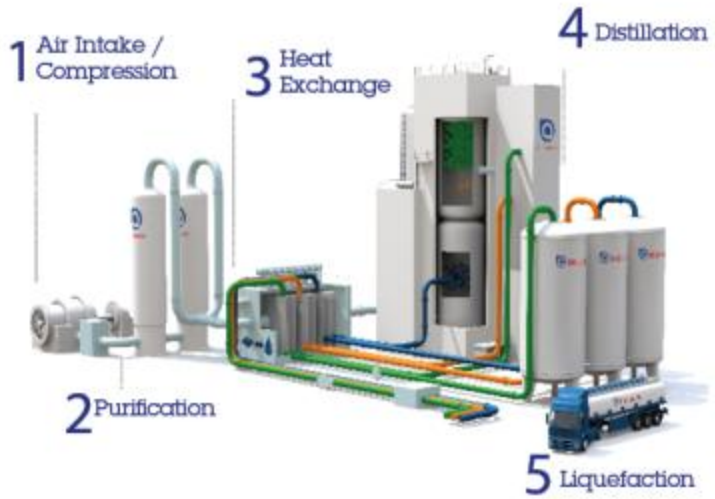
Rare gases removed in waste stream

Impurities

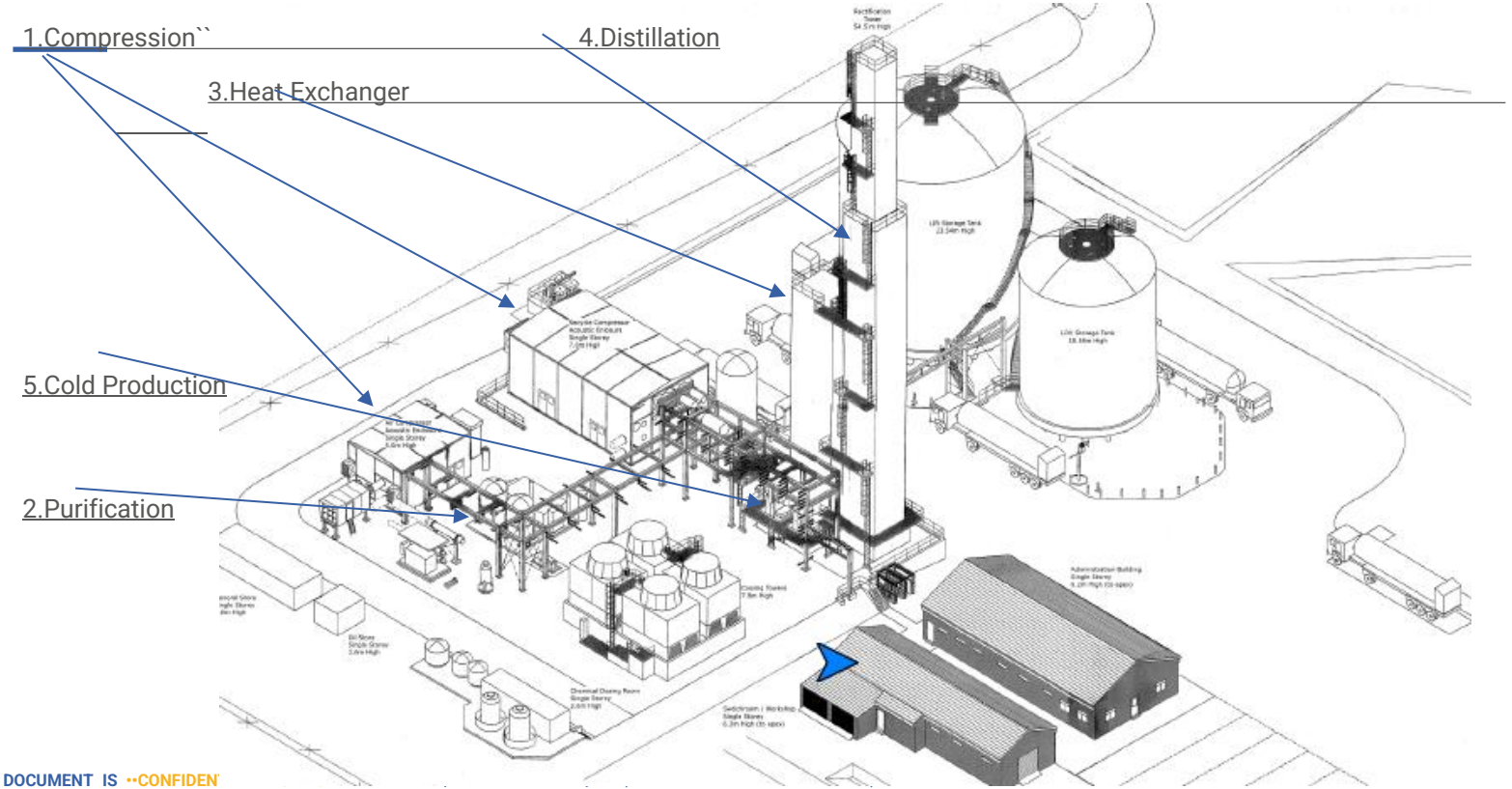
Coleshill ASU Overview



Video and drone footage



Coleshill ASU Overview



Coleshill ASU Overview - Stage 5 Cold Production

Recycle Gas Compression

The equipment is big

5 Bar N2 Gas Inlet @ 18C

28 bar N2 Gas Outlet @ 20C

N2 Gas

Cooler Bundles fed by

process water

Process water feed &

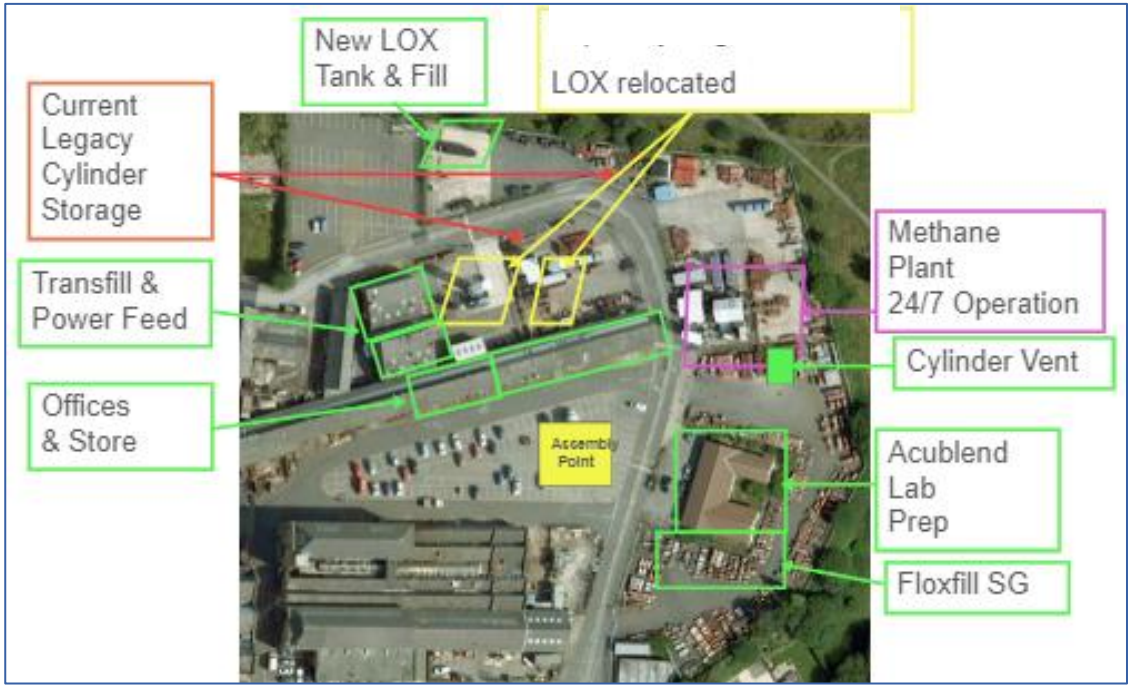
return pipework

3

Specialty Gas - Tunstall

Specialty Gas production site -Tunstall, Stoke-on-Trent

Specialty Gas production site -Tunstall, Stoke-on-Trent



- UK's only methane production facility
- Specialty Gases = Mixtures and high purity gases (upto 7 grade = 99.99999%)
- Impurities

Floxfill

- Gravimetric
- Manual & Automatic Blending Panels
- Blend Tolerance 2-5%
  Analytical Accuracy 1-2%
- Capability up to 20 Component Mixtures

Acublend

- Dynamic blending of gases
- Mixture is analysed prior to fill
- This means we can batch fill - nominally identical mixtures (2-16 cyl)
- Blend Tolerance 1-5%
  Analytical Accuracy 1-2%

Transfill

- Large range of gases
- Transfill from large to small (e.g. 500L to 1L)
- Particularly important for our hydrocarbon supply
- Capability of transfilling ALPHAGAZ™ 2 Nitrogen into residual cylinders

Other important sites

- Eynsham, nr Oxford - Helium facility
- Runcorn - hydrogen
- Wissington - CO2

4
ECO-ORIGIN

ECO ORIGIN™:
One easy step to decarbonization

Our climate smart gas portfolio

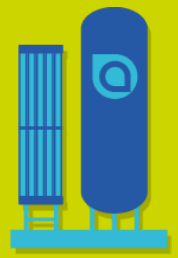
Driven by the common objective of a carbon-neutral future

Scope 3 (upstream)

All our climate smart gases will have a verified lower climate impact thanks to using 100% renewable energies.

Climate smart gases

ECO ORIGIN™



Air gases

The ECO ORIGIN™ offer for bulk air gases

A low-carbon value chain

Oxygen, Nitrogen and Argon are extracted directly from **ambient air**.
These molecules, naturally present around us, have no greenhouse effect or climate impact.

Improvements are continuously implemented in our air separation units to maximize our efficiencies and reduce the energy usage.

Renewable electricity (via Renewable Energy Guarantees of Origin) is used to power our air separation units.

The electricity needed for the air separation accounts for about > ⅔ of the Product Carbon Footprint*

Our liquid gas transport fleet is progressively converted to **alternative trucks and fuels**, routes and logistics are optimized continuously in order to reduce transport emissions.

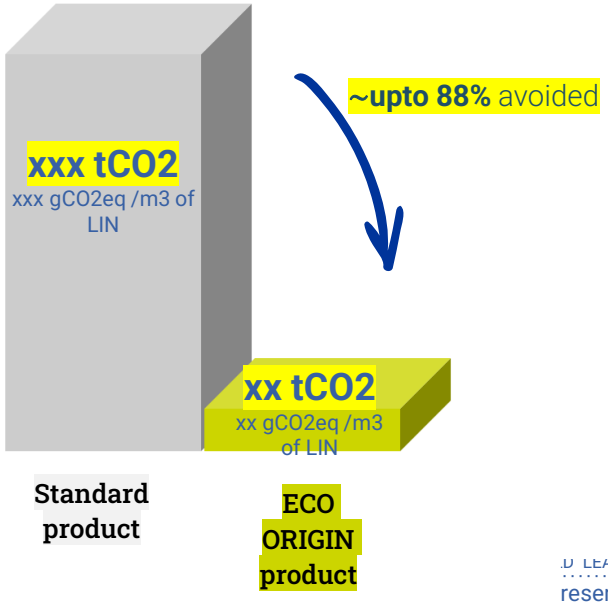
Residual CO2e emissions from transport is climate compensated

You receive a **yearly certificate** including the **verified product carbon footprint** of your molecule(s) as well as your CO2e reductions thanks to choosing ECO ORIGIN. These are certified and audited by an independent 3rd Party according to **ISO 14021** and **ISO 14067**.

for Air Liquide Bulk Air Gases Standard Product (not using renewable energy in production)

Your potential ECO ORIGIN™ gas CFP

CO2eq figures



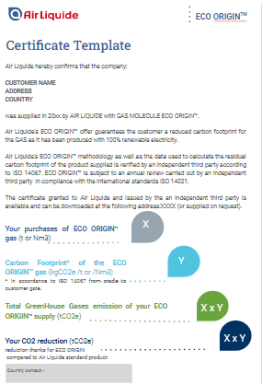
Yearly ECO ORIGIN™ gas consumption

xxxkm3 LIN

CO_2 emissions avoidance

Compared to Air Liquide's standard product

XXXt CO2eq/y


Air Liquide ECO ORIGIN™

Certificate Template

Air Liquide hereby confirms that the company:

CUSTOMER NAME
ADDRESS
COUNTRY

was supplied in 20oo by AIR LIQUIDE with GAS MOLECULE ECO ORIGIN™.

Air Liquide's ECO ORIGIN™ offer guarantees the customer a reduced carbon footprint for the GAS as it has been produced with 100% renewable electricity.

Air Liquide's ECO ORIGIN™ methodology as well as the data used to calculate the residual carbon footprint of the product supplied is verified by an independent third party according to ISO 14067. ECO ORIGIN™ is subject to an annual review carried out by an independent third party in compliance with the international standards ISO 14021.

The certificate granted to Air Liquide and issued by the an independent third party is available and can be downloaded at the following address:XXXX (or supplied on request).

Your purchases of ECO ORIGIN™ gas (t or Nm3) X

Carbon Footprint® of the ECO ORIGIN™ gas (kgCO2e /t or /Nm3) ..... Y

* In accordance to ISO 14067 from cradle to customer gate.

Total GreenHouse Gases emission of your ECO ORIGIN™ supply (tCO2e) ..... XxY

Your CO2 reduction (tCO2e) ..... XxY

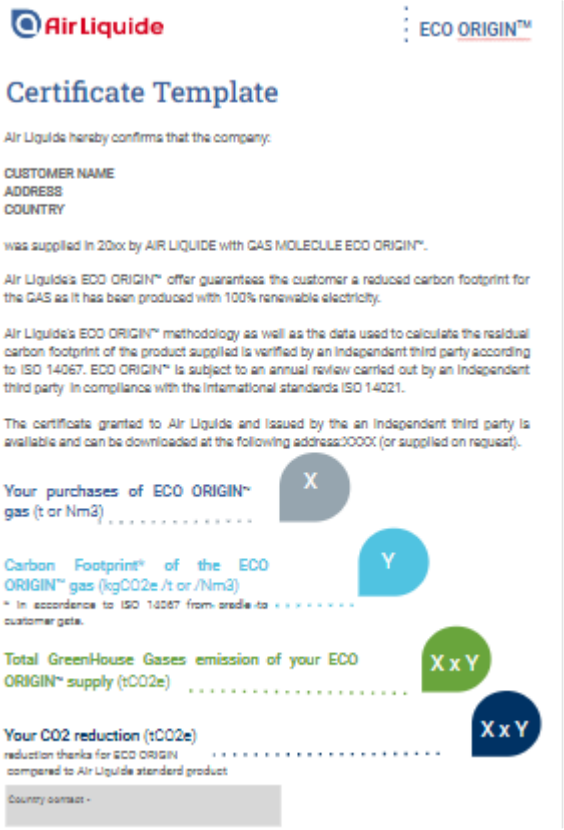
reduction thanks for ECO ORIGIN compared to Air Liquide standard product

Country contact :

You receive a yearly customer certificate, that includes:

- Supplied ECO ORIGIN volumes
- Product carbon footprint
- Total carbon footprint of the supplied gas
- Avoided CO2

Your Yearly Certificate Letter



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Your CO2 reduction (tCO2e) ..... X x Y
reduction thanks for ECO ORIGIN compared to Air Liquide standard product

Country contact -

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Thank-you

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