PUBLIC

DAPHNE® TECHNOLOGY

NO_x SO_x CH_4 N_2O NH_3 CO_2

Daphne Technology

Solving the methane and GHG challenge in tough-to-decarbonise industries

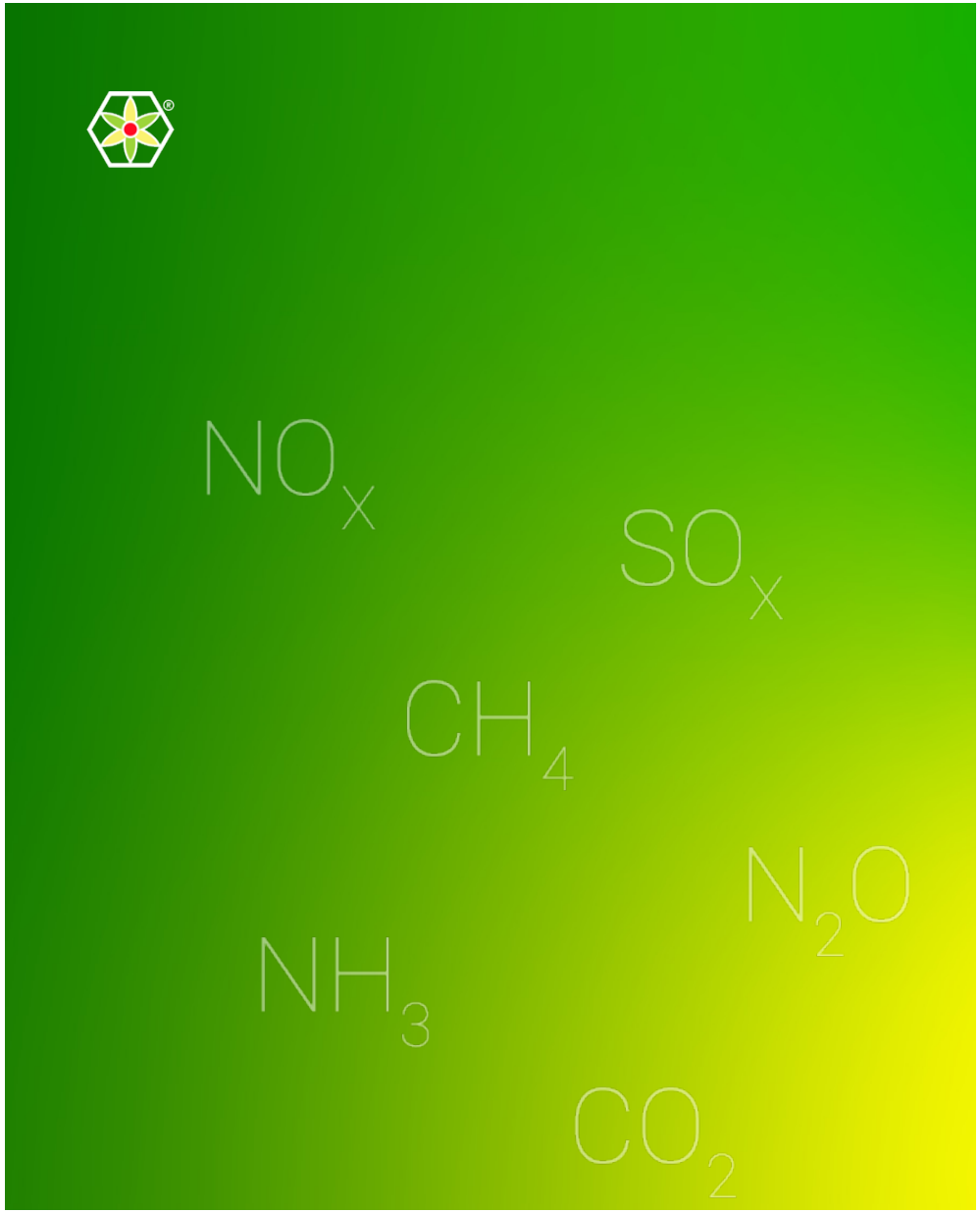
- It’s our business to make your business sustainable

ABOUT US

Where science and technology interact for global impact

Daphne Technology is an award-winning **Climate Deep Tech** company pioneering innovative technologies to reduce GHG and toxic emissions.

DAPHNE TECHNOLOGY



OUR PURPOSE & MISSION

Technology leading the way to Net-Zero

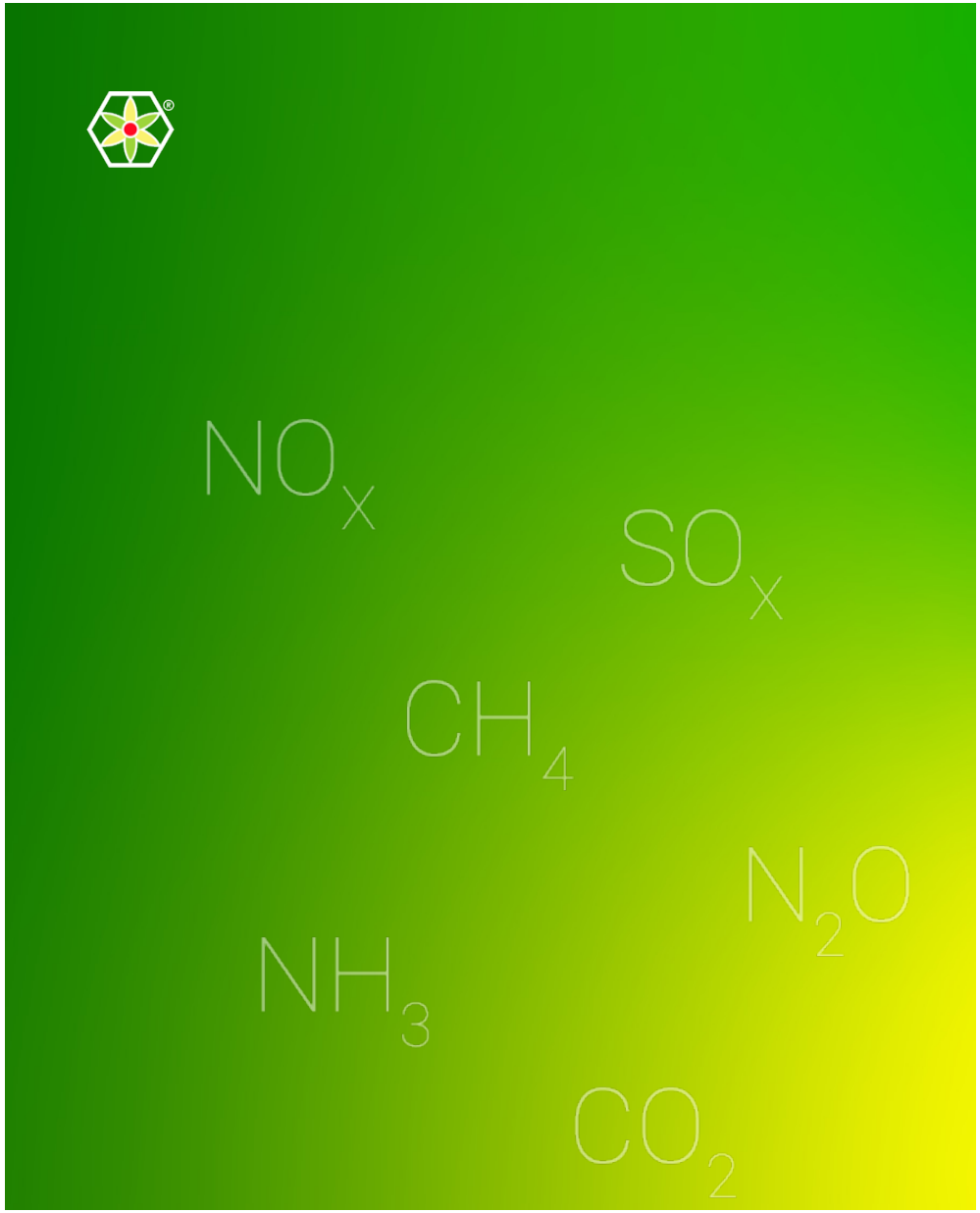
Purpose

We protect the environment by developing and integrating innovative technology that removes methane, other GHG and toxic emissions.

Mission

We focus on solving the methane challenge in tough-to-decarbonise industries.

We measure, reduce and monetise the reduction of methane emissions from industrial sources by developing and integrating innovative technology.



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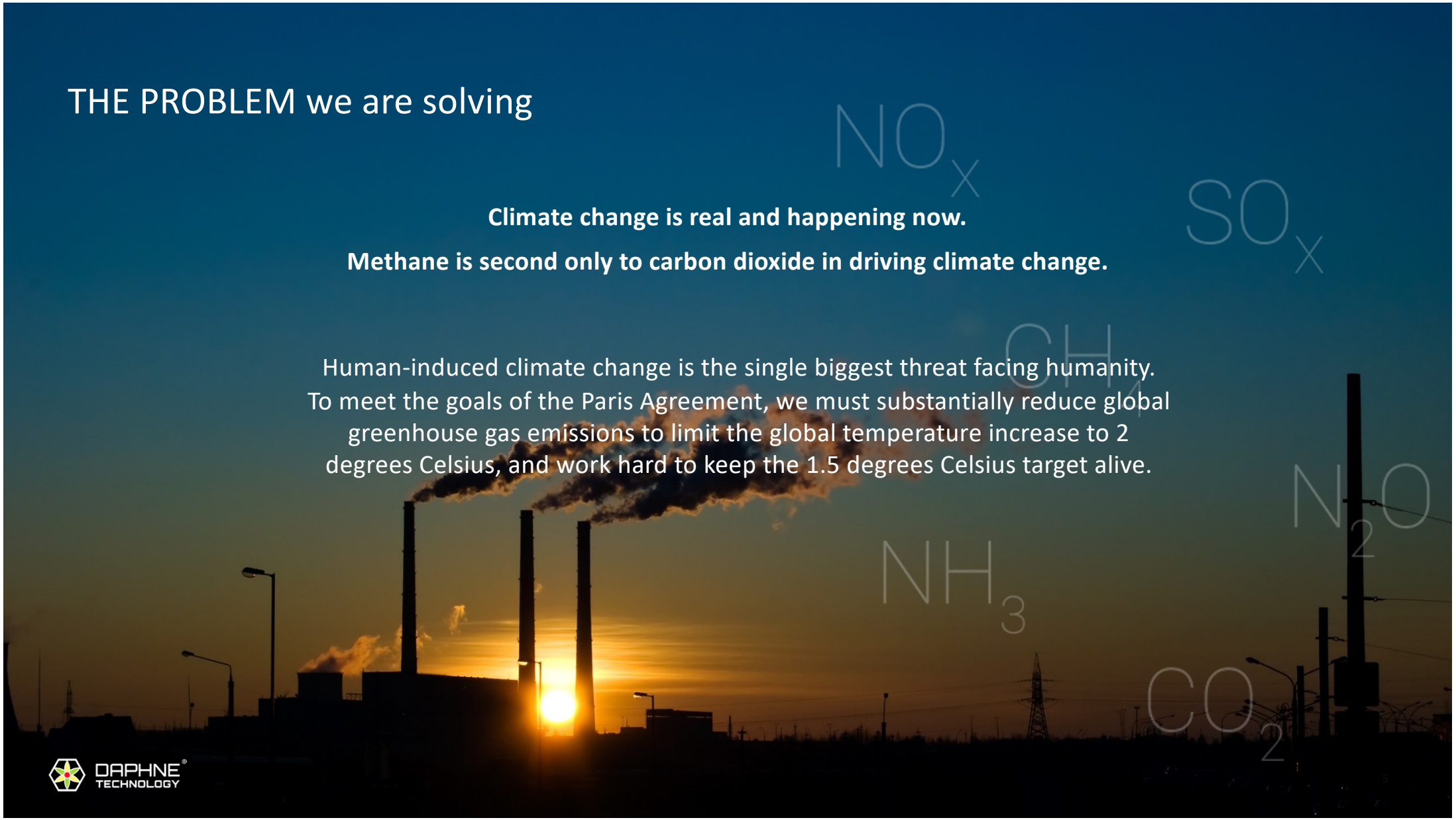
THE PROBLEM we are solving



Climate change is real and happening now.

Methane is second only to carbon dioxide in driving climate change.

Human-induced climate change is the single biggest threat facing humanity. To meet the goals of the Paris Agreement, we must substantially reduce global greenhouse gas emissions to limit the global temperature increase to 2 degrees Celsius, and work hard to keep the 1.5 degrees Celsius target alive.

DAPHNE® TECHNOLOGY

MAKING A GLOBAL IMPACT

Daphne Technology has a direct positive impact on six out of United Nation's 17 sustainable development goals

Source: Gothenburg Centre for Sustainable Development's SDG Impact Assessment Tool.

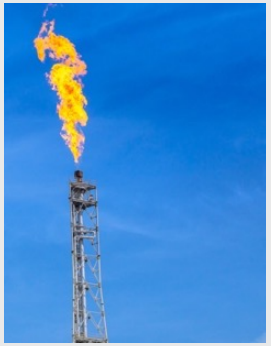
OUR TARGET MARKETS

Daphne targets CH_4 emission inefficiencies in Power Generation and Energy Conversion

Onshore Energy Sector

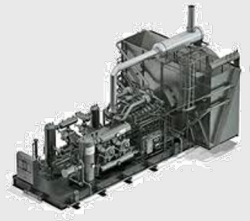
Upstream
(Oil, Heavy Gas Flaring)

Flares, Burners
(CH_4, SO_X, CO_2)



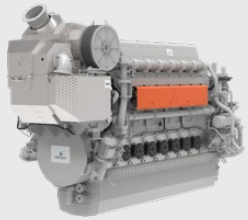
Midstream
(Natural Gas, Biogas Treatment)

Gas Treatment, Compression Engine
(CO_2, CH_4)



Downstream
(Power Generation)

Power Plants
(CH_4, SO_X, CO_2)



Energy Conversion

Fuel → **Energy Conversion** → **Available Energy**

	GHG & Toxic	Impact
LNG (Methane)	CH_4	82.5 x CO_2

Image credit: MAN, Wärtsila, GE Gas Power, Research Gate, BW Group

OUR SOLUTIONS

Our patent-protected solutions enables you to reduce your emission profile while meeting strict environmental regulations

PureMetrics™

An emission monitoring system to measure greenhouse gases (GHGs) released in the exhaust from maritime and land-based combustion engines and other applications.

The solution helps corporates accurately measure Scope 3 emissions, delivered in auditable reports so they can become net-zero in a shorter time.

SlipPure™

An innovative exhaust gas cleaning system reducing methane (CH_4) emissions from the exhaust gas.

A solution for natural gas-fired internal combustion engines in maritime, oil & gas and land-based industries.

SulPure®

A circular economy system removing sulphur oxides (SO_x) emissions from burning fuels with high sulphur content.

The solution removes sulphur oxide pollutants from exhaust or flue gases by capturing SO_x and upscaling it to ammonium sulfate fertiliser for agricultural use.

OUR INNOVATIVE SOLUTIONS

Measure

PureMetrics™

Third-party Hardware

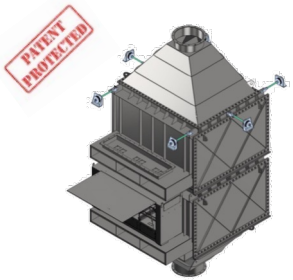
Software Stack

amazon web services · kafka · OPENVPN · AWS IoT · influxdb · PostgreSQL · django · mosquitto · python · docker · NUXTJS

User Interface

TRL 8

Reduce



SlipPure™

TRL 6

- Removes Methane slip in exhaust gas from combustion of LNG
- Proprietary approach
- Land and sea applications

SulPure®

TRL 8

- Circular economy approach
- Capturing Sulphur and converting to useful by product (fertilizer)
- Land and sea applications

Integrate

Enabling Carbon Capture in difficult to implement industries

SlipPure™ + CarbonCapture

SulPure® + CarbonCapture

Note: TRL = Technology readiness level; TRL 8 = system complete and qualified; TRL 7 = system prototype demonstration in operational environment; TRL 5 = technology validated in relevant environment

OUR BUSINESS MODEL – PORTFOLIO APPROACH TO DECARBONISATION

Helping clients measure, reduce and monetise the reduction of GHG emissions

Measure

Embedded Hardware

Encrypted Data Transmission

Web Application

Reduce

H_2S/SO_X CH_4 CO_2

Monetise

HaaS[(1)] + SaaS service model ecosystem

- Pay monthly subscription fee to use hardware and software
- Long-term contract (~5-year)

Measure and report exact tons of CO_2 and CH_4 emissions in real-time with 100% confidentiality

Equipment Sales + Cartridges + Service + Maintenance

- Unlocking aftermarket success with installed base
- Platform equipment generates recurring revenue by selling consumables for the equipment owned by client

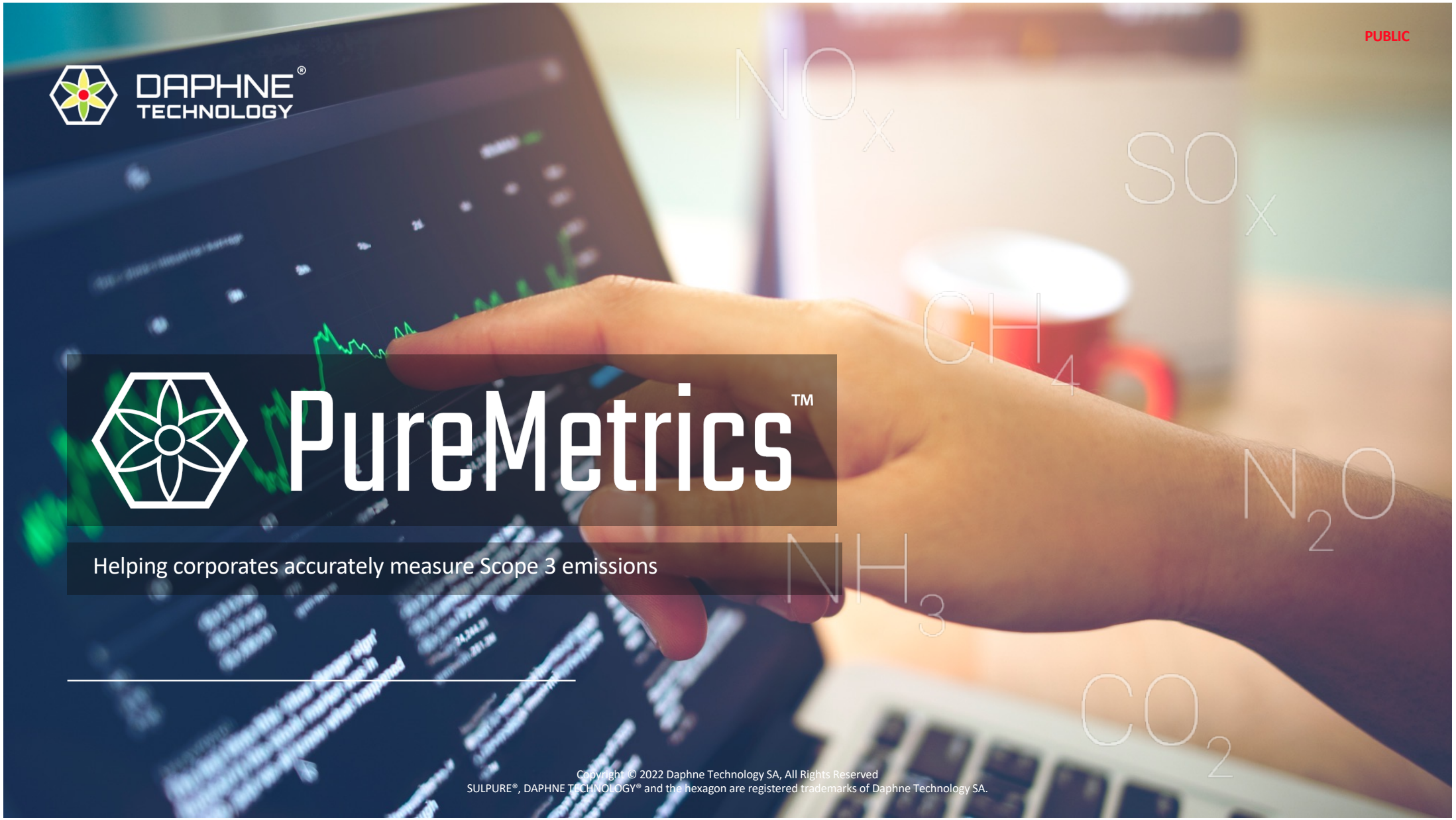
Recurring revenue model + high level of client entanglement + high lifetime revenue potential per solution

Turnkey solution provider

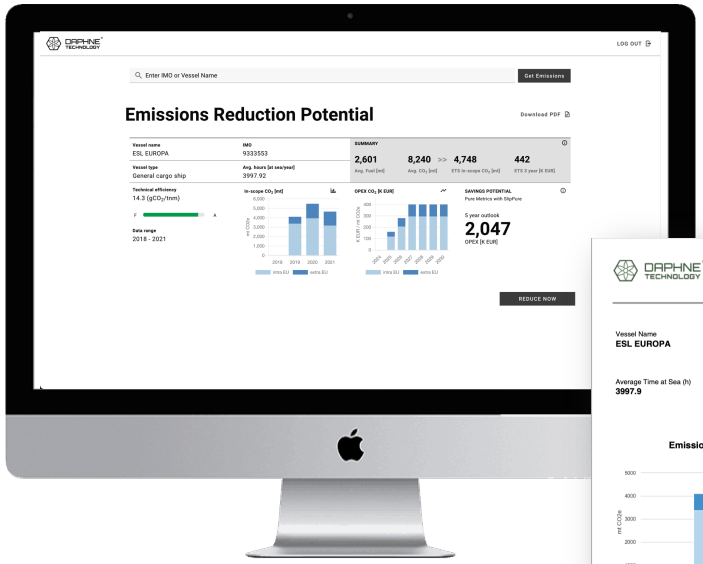
- Approved methodology
- Approved project design
- Approved monitoring of results

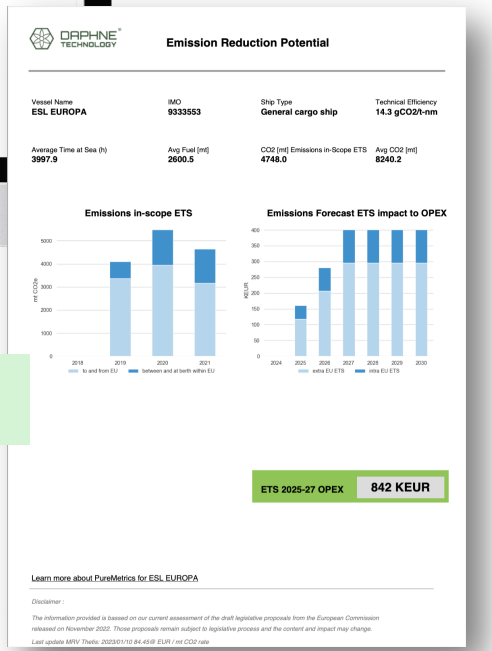
New revenue stream + OPEX reduction opportunities = competitive edge for clients

Note: (1) Hardware-as-a-Service – No Customer CAPEX investment

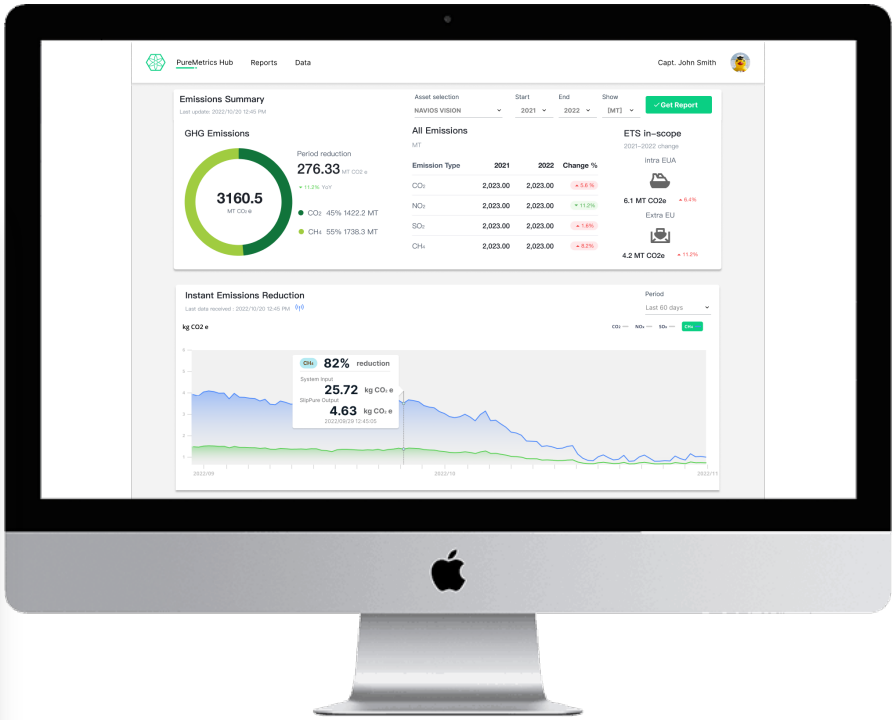


PureMetrics™ – FROM PRE-ASSESSMENT TO SAAS/HAAS





Understand historical MRV Reported Emissions and impact to OPEX due to ETS.



GHG aggregate from CO_2 and CH_4 as CO_2e, and real-time view of emissions data.

Nature Techies

Sie nutzen die digitale Transformation, um die Natur zu schützen und zu erhalten.

Sarah Barber

Leiterin Wind energy - Innovation an der Ost-schweizer Fachhochschule OST, St. Gallen (42)

Aurélien Demaurex

Co-gründer, CFO und Vice chairman Ecorobotix, - Yverdon-les-Bains VD (44)

Christoph Gebald

Co-Gründer und Co-CEO - Climeworks, Zürich (40)

Auréline Grange

Co-Gründerin und Chief Climate Officer Open Forest Protocol, Lausanne (33)

Renat Heuberger

CEO South Pole, Zürich (46)

Marco Mattmann

Leiter Smart Farming Fenaco, Sursee LU (46)

Mario Michan

Gründer und CEO Daphne Technology, St-Sulpice VD (48)

Attila Steinegger

Manager Digital - Transformation WWF, Zürich (34)

Luc Piguet

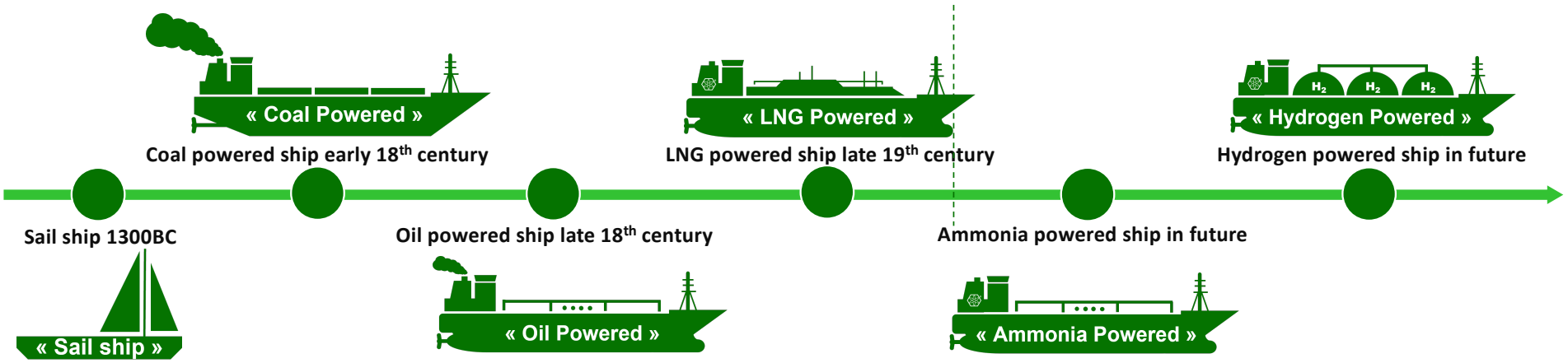
Co-Gründer und CEO ClearSpace, Renens VD (51)

PUBLIC

SlipPure™

Reducing methane (CH_4) emissions from post-combustion industrial sources.

MARITIME FUEL TRANSITION – SAIL SHIP TO HYDROGEN POWERED SHIPS

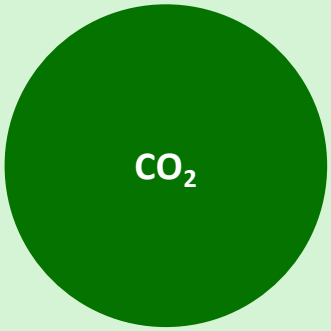


	2020	2025	2030	2050
Regulation	• MARPOL SO_X, NO_X	• Ship Energy Efficiency Index • IMO and EU methane slip (CH_4)	• Ammonia slip (NH_3) and emissions of NOX and N_2O	• Cleanest fuel, but emissions of NOX
Pollution Impact	• Premature deaths and health issues • Acid rain and ocean acidification • Global warming	• Global warming potential (GWP100) of methane is 84 times that of CO_2	• N_2O warming effect 298 times that of CO_2 • NH_3 highly toxic	

Note: Using GWP over 20years

METHANE'S ROLE IN GLOBAL WARMING

GHG in the atmosphere



Atmospheric lifetime
300 – 1000 yrs

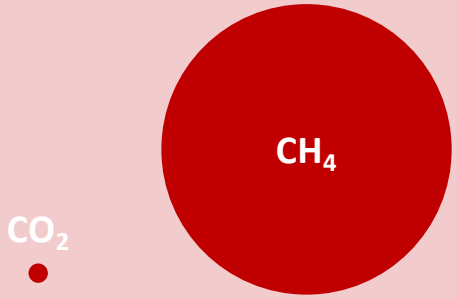
CH_4

Atmospheric lifetime
12 years

+ 150%

Increase between 2012-2018 of methane slip emissions form shipping

Contribution to global warming

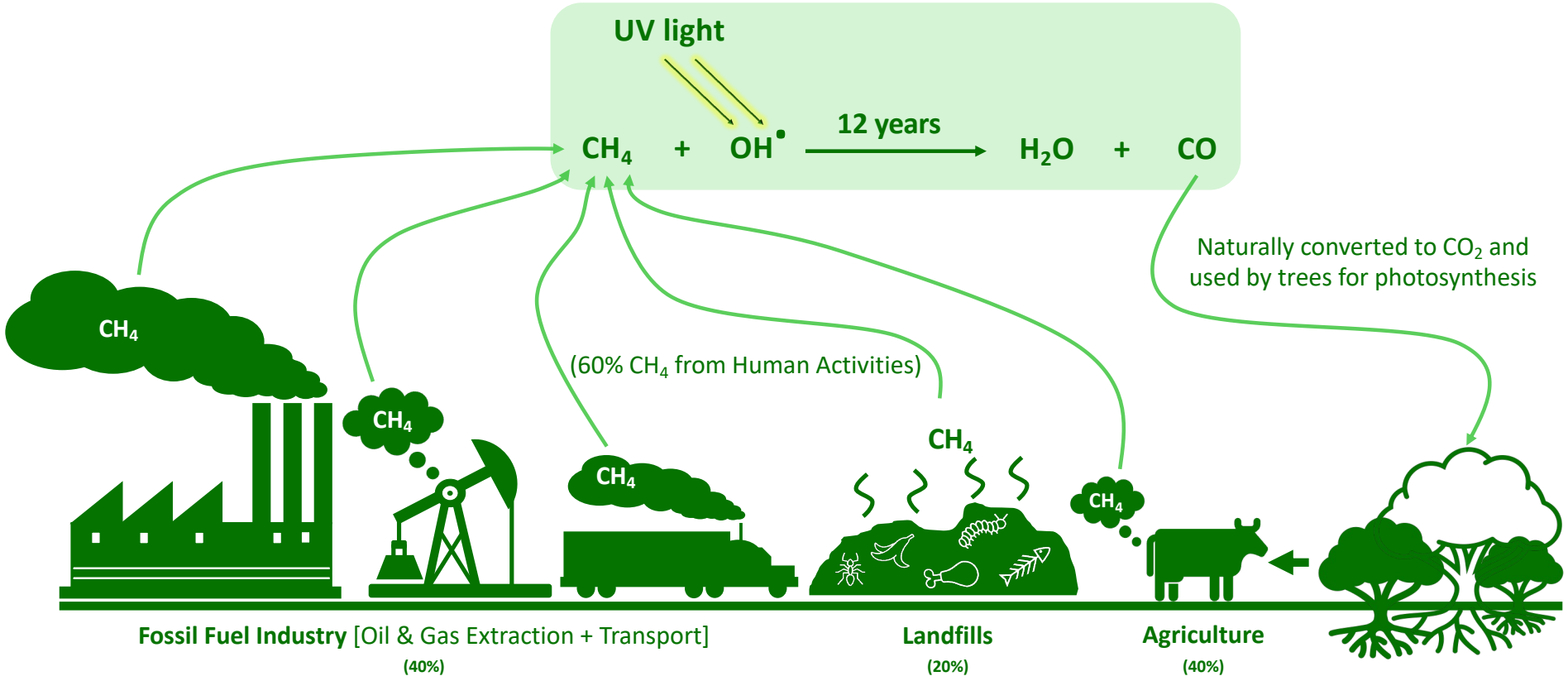


84X

Methane slip emission is 84 time worse than CO_2 (GWP100)

Source: https://www.ccacoalition.org/en/content/benefits-and-costs-mitigating-methane-emissions
https://climate.nasa.gov/news/2915/the-atmosphere-getting-a-handle-on-carbon-dioxide/#:~:text=Carbon%20dioxide%20is%20a%20different,between%20300%20to%201%2C000%20years.

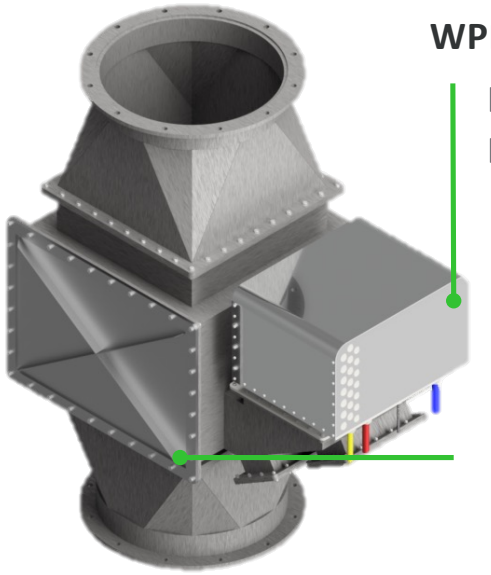
NATURAL METHANE CYCLE



Source: The Company

SlipPure™

Removes methane emissions from the exhaust gas of LNG engines



WPP™ Power Supply

Electrical Energy → Chemical Energy

Cartridge

Pollutant removal

- SlipPure™ is completely absorbent-free, utilising electric power to ultimately convert methane to carbon monoxide (CO) and water (H_2O)
- The formation of energetic electrons in the exhaust gas (within the cartridge) occurs during electrical excitation generated from a power supply. This high-voltage (HV) power supply must be efficient in transferring electrical energy into chemical energy that is used for pollutant breakdown
- The Power Supply energizes or powers the cartridge system, essentially taking electrical energy and delivering it the exhaust gas flow as chemical energy

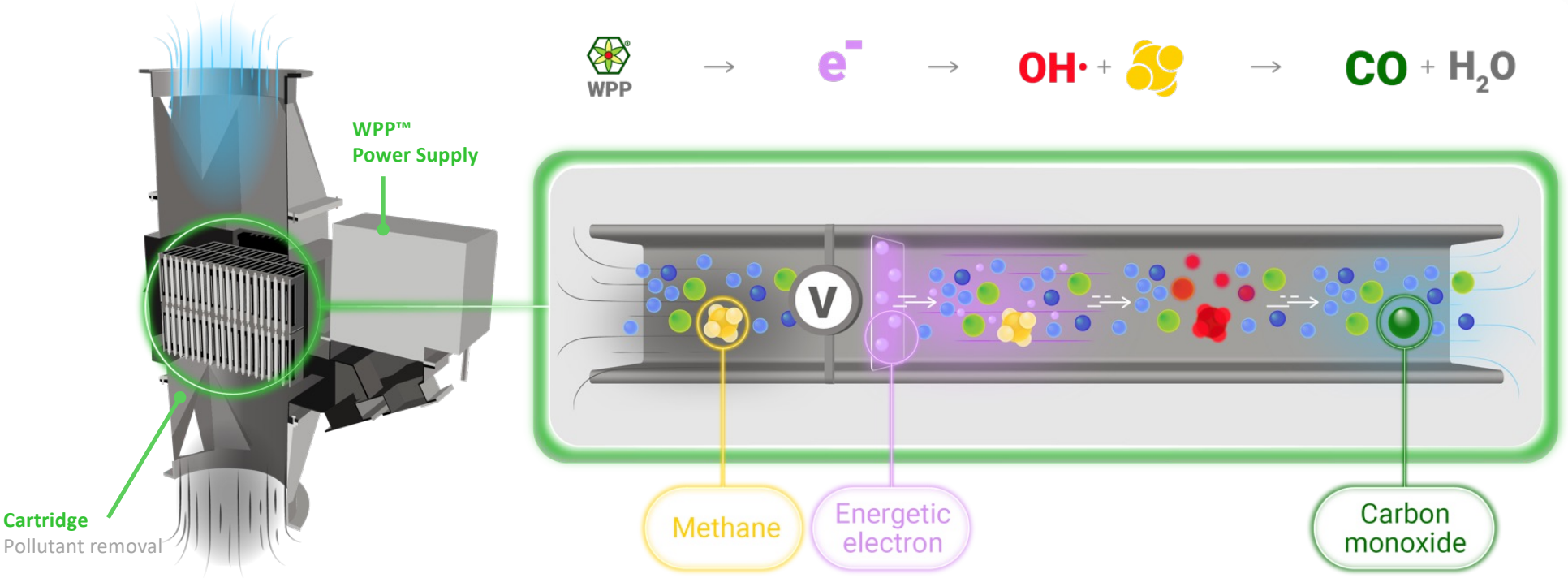
HOW SLIPPURE™ WORKS?

High Energy Electron

$$CH_4 + OH_{\bullet} \xrightarrow[\text{a second}]{\text{Fraction of}} H_2O + CO$$

Natural Methane cycle recreated using High Energy Electron = Exhaust Gas CH_4 removed

PATENT PROTECTED

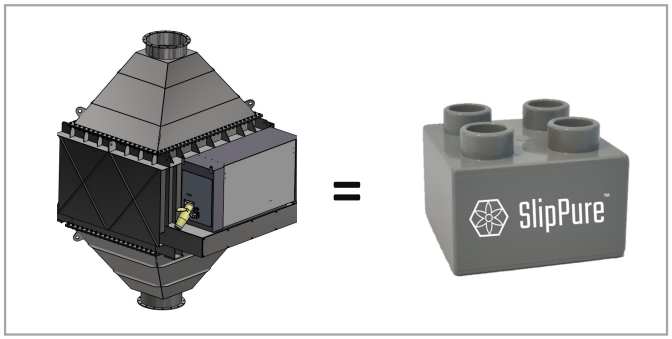


Source: The Company

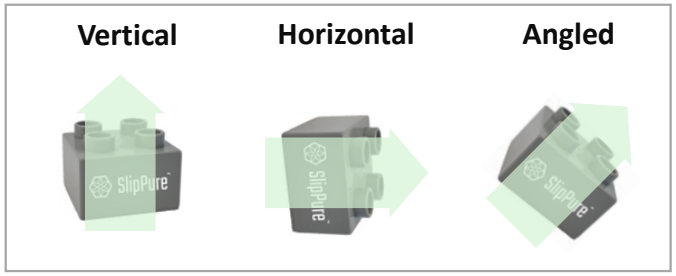
MODULAR SLIPPURE™ INSTALLATION

Scaling through modular construction

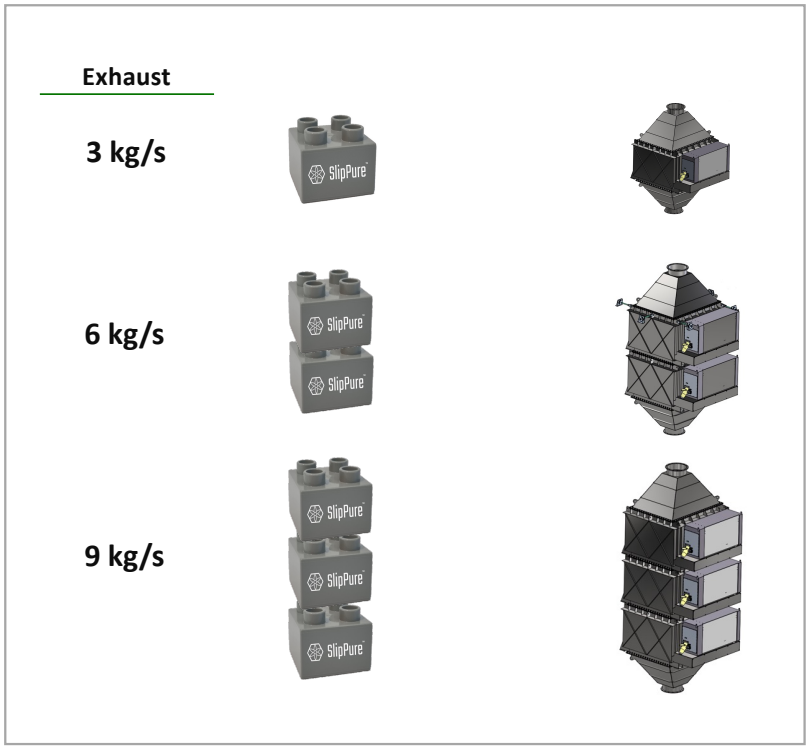
Entry Module – 3 kg/s



Spatial Possibilities

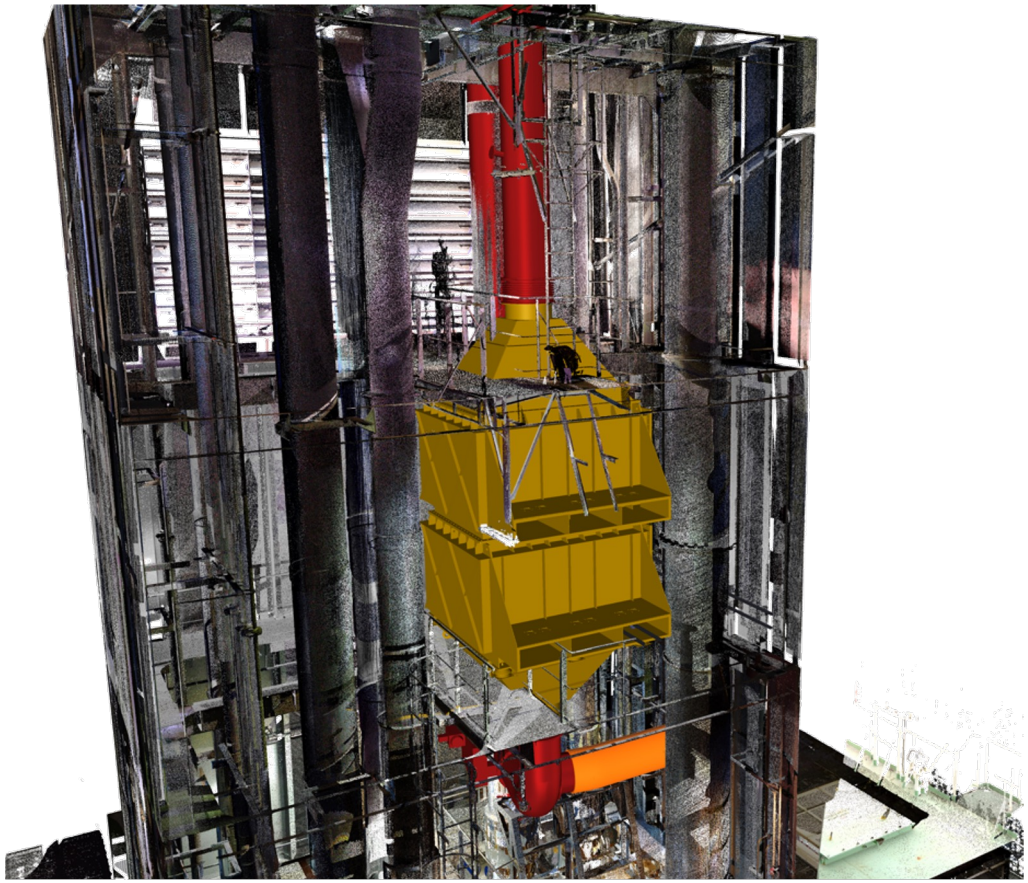


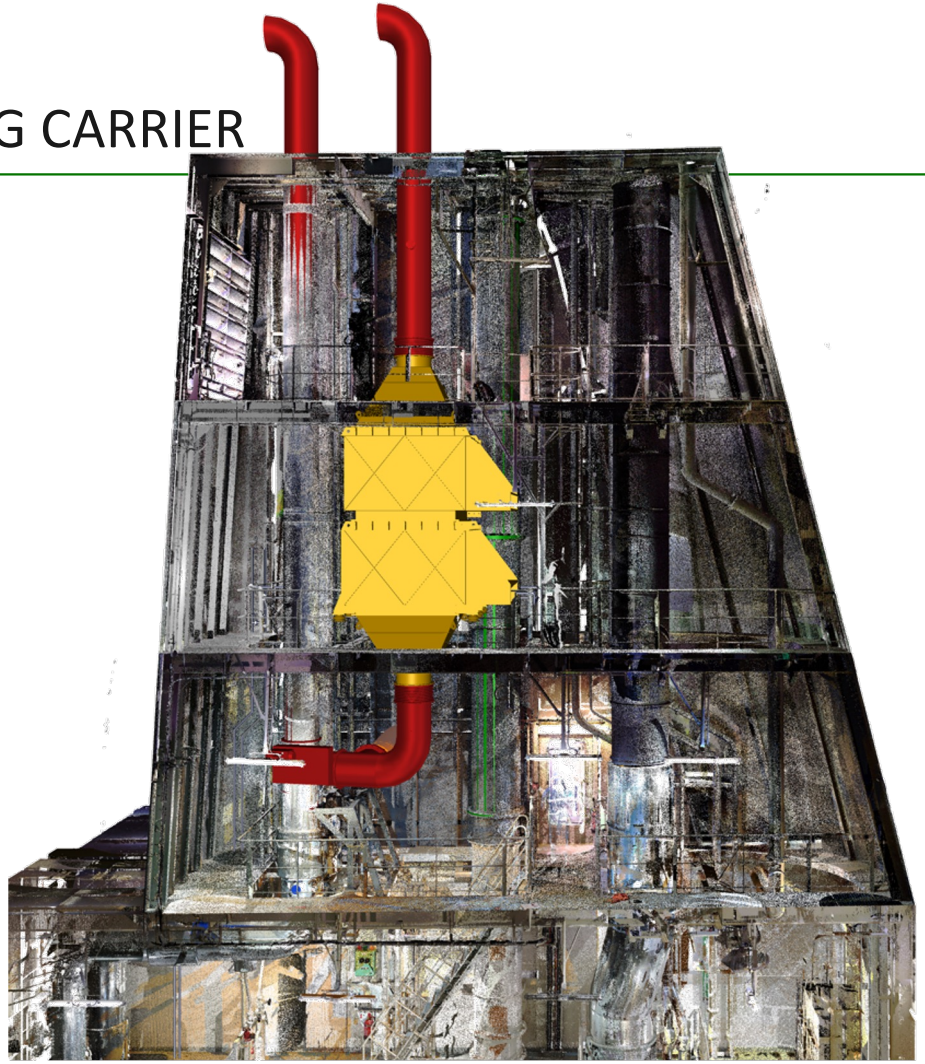
Configuration Examples



Source: The Company

3D MODEL SNAPS OF SlipPure™ ON LNG CARRIER

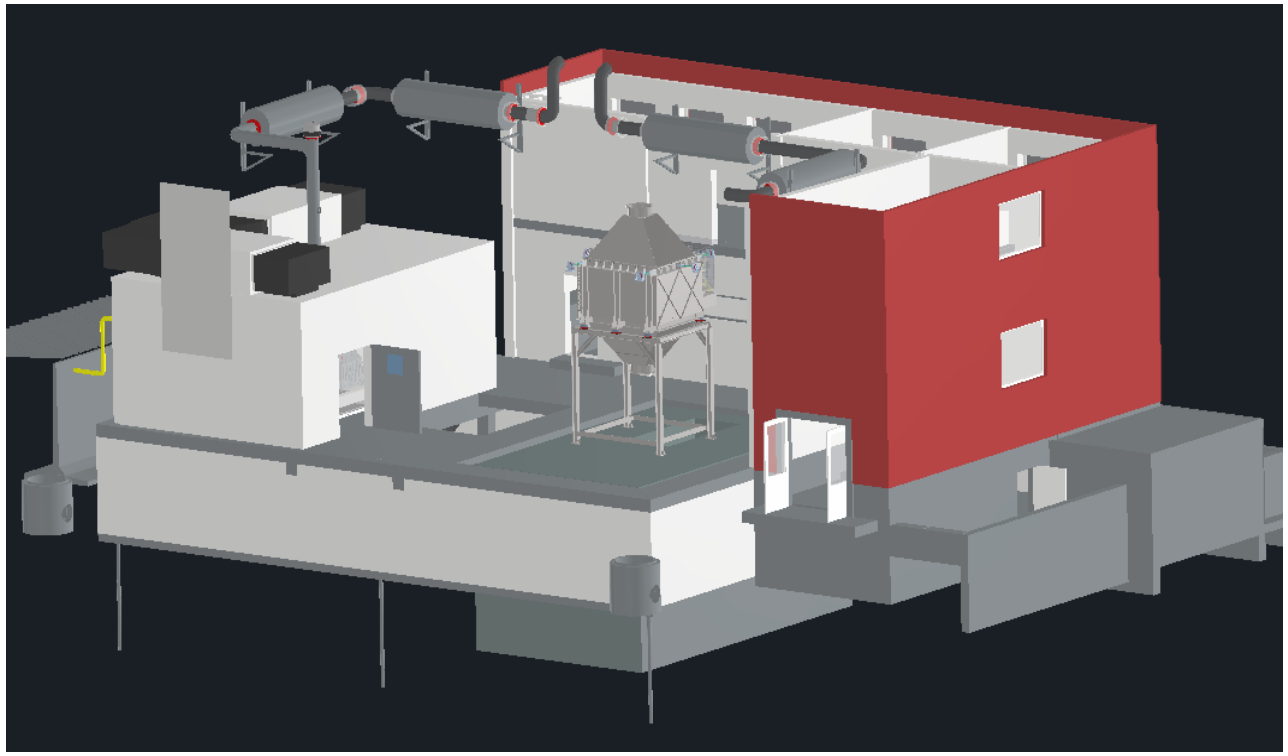




Source: The Company

LAND BASED TESTING ON RESEARCH ENGINE

Full-scale testing on an LNG-fuelled engine in a test facility in Q1/2023



Source: The Company

REAL APPLICATION TESTING

SlipPure™ installation at LNG Carrier

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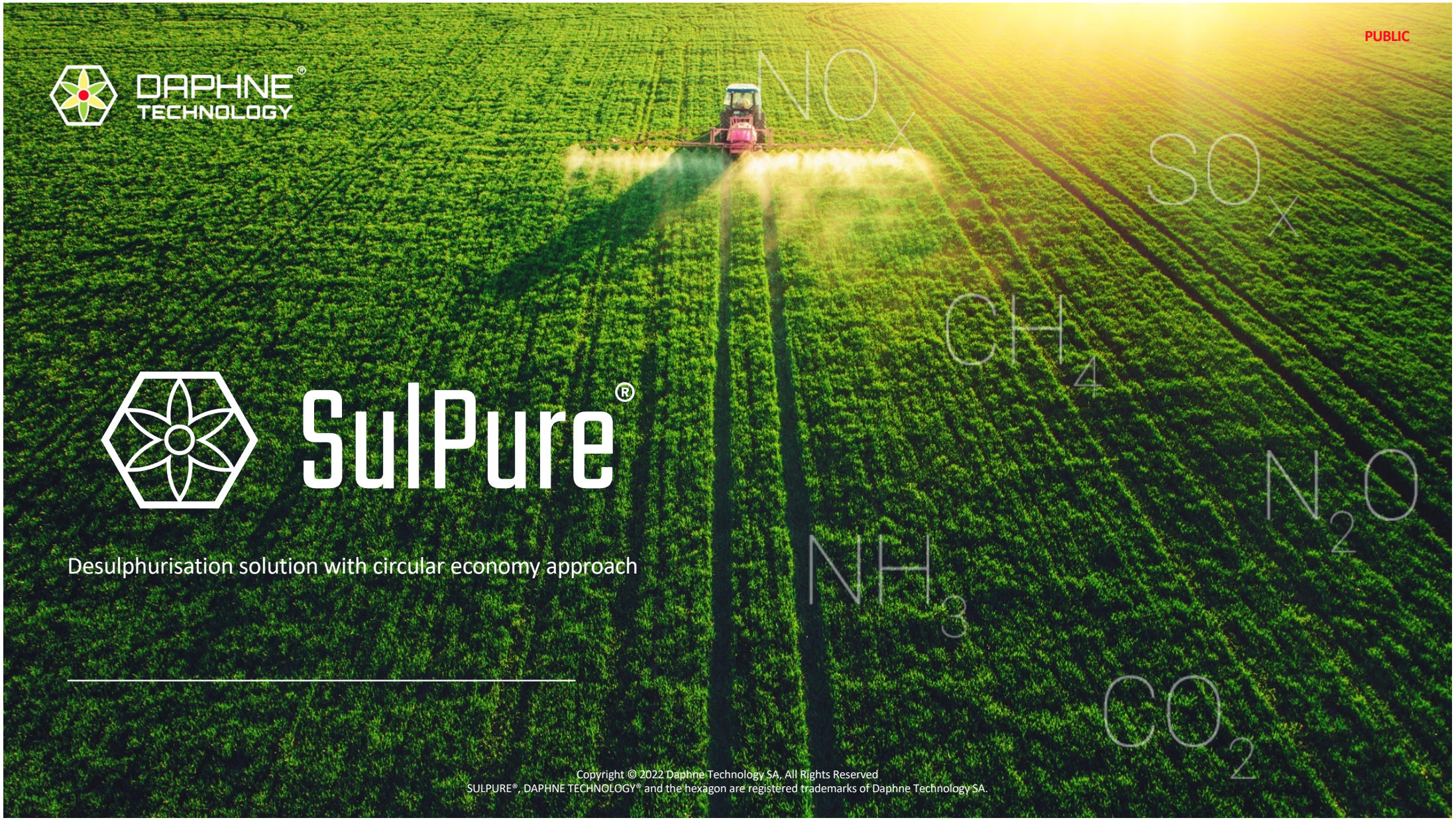
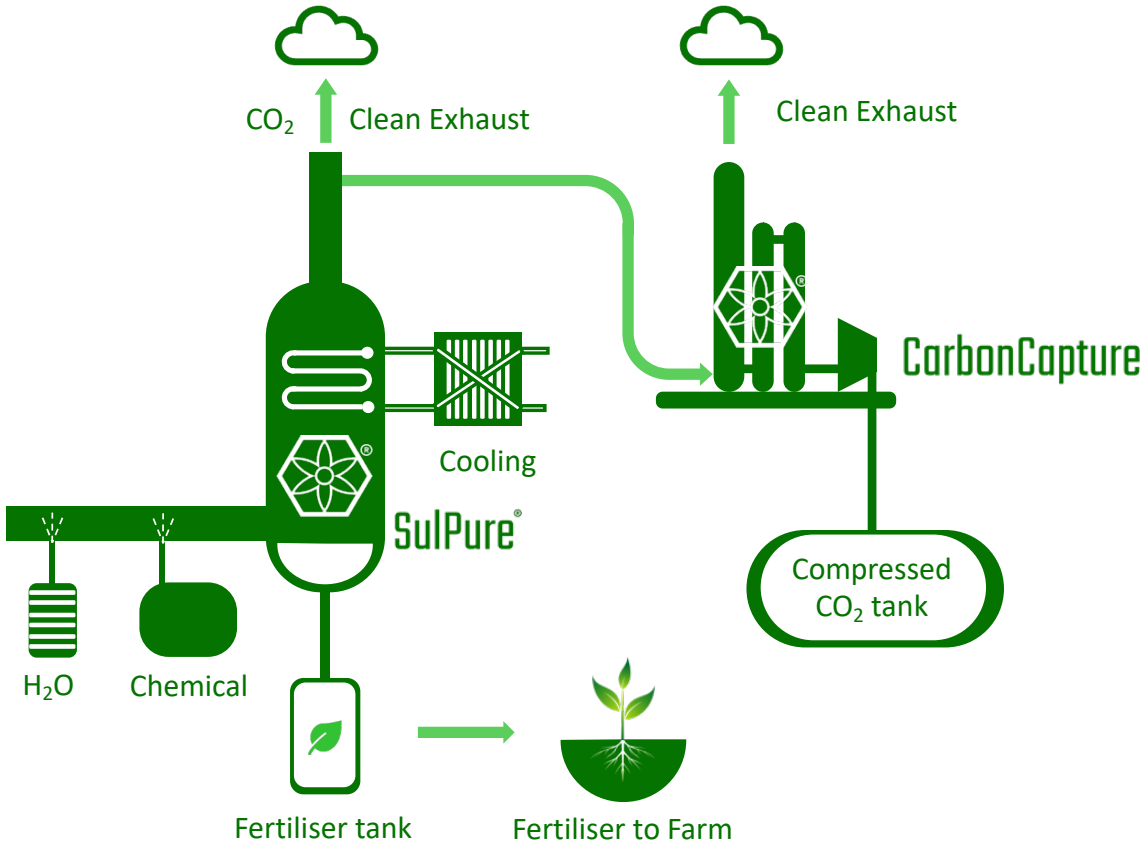
DAPHNE® TECHNOLOGY



SulPure®

Desulphurisation solution with circular economy approach

SulPure® + CarbonCapture SYSTEM DIAGRAM



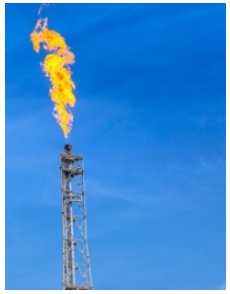
- SulPure® removes SOx pollutants from exhaust or flue gases
- SulPure® captures SOx and upcycles it to ammonium sulfate for agricultural use
- Daphne's Licensed Carbon Capture technology integrated with SulPure® System produces food-grade CO_2
- Waste heat in exhaust is used to assist the Carbon Capture Process to reduce fuel penalty

Source: The Company

USE CASE: ZERO EMISSION FLARE

Selected by middle eastern company to install solution

Client Goal



Zero emission flare

- Transforms captured hydrogen sulfide from gas into valuable by-product (SulPure®)
- Reduce methane emissions from gas combustion (SlipPure®)
- Capture CO_2 emissions from gas combustions (CarbonCapture)

Market need

- Countries are signing ”net-zero” declarations
- Technologically very challenging to solve the problem

Global market opportunity

- 2.6B Cubic meters of gas flared annually (one country example)
- 150B cubic meters of gas flared annually across the globe

Our Solution

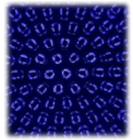
SulPure®

+

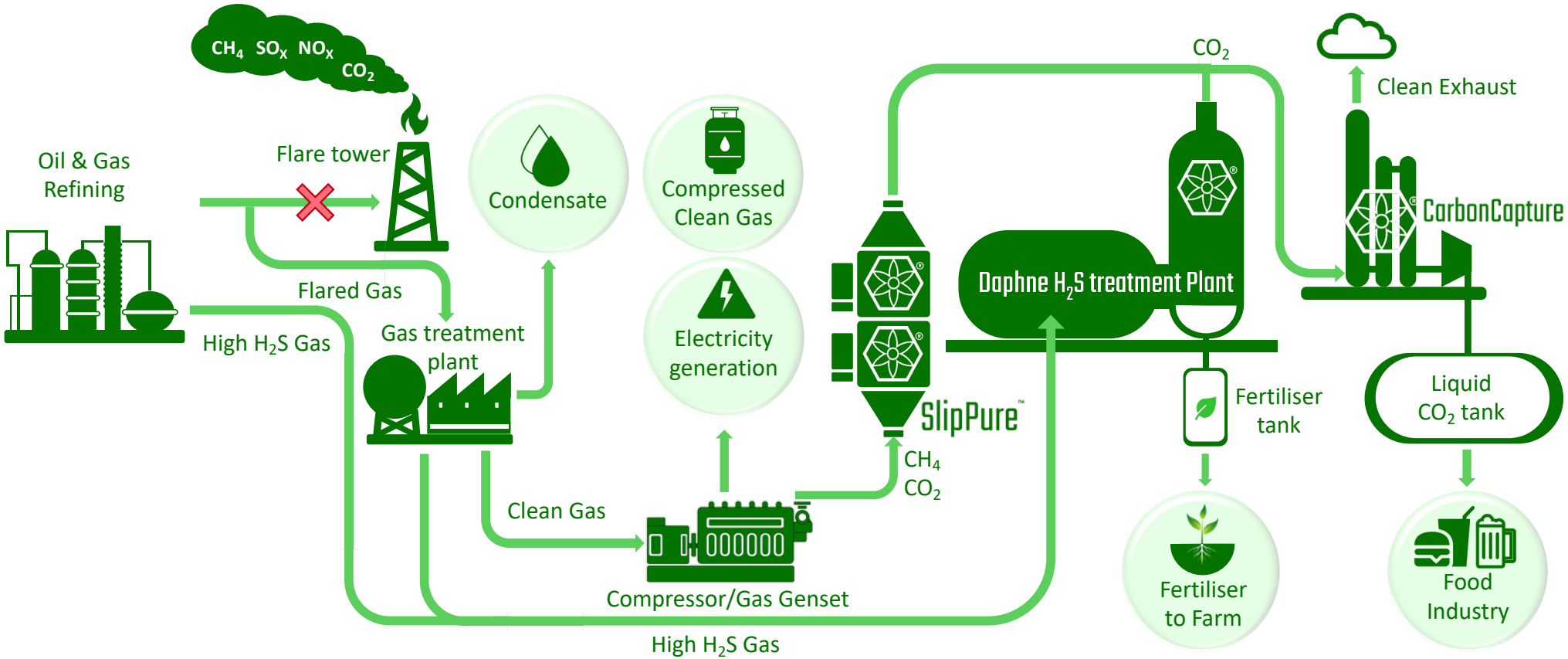
SlipPure™

+

CarbonCapture



FLARE GAS DECARBONISATION



Source: The Company

TESTING ON RESEARCH ENGINE

REAL APPLICATION TEST

OUR HISTORY

2014 Postdoctoral Researcher, Antimatter Factory at CERN

Dr Mario Michan

Research Scientist, The Swiss Federal Institute of Technology (EPFL)

2016

2018

Grants Raise CHF 0.5m (R&D)

Equity Raise CHF 14m

4Q21

Crowdfunding €0.6m (Friends, Family, Supporters)

JUNE 2021

Winner of EU Horizon 2020 Grant €2.5m

2020

Equity Raise CHF 4m (R&D)

2019

Land Based Expansion (1st Contract)

2Q22

Carbon Capture Licensing Agreement Signed

SEPT. 2022

Equity Raise B Extension CHF 3m

Nov. 2022

1st Marine Contract

2Q23

Scale up

4Q23

Visit https://daphnetechnology.com/about for our full history and milestones.

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TESTIMONIALS

With our high-tech, innovative approach, we are proud to have attracted global industrial leaders as our strategic shareholders, all committed to working with us to enable an economically sustainable energy transition

"We are very pleased to support Daphne in their mission to create a more sustainable energy future. Daphne's technology addresses a significant challenge in the hard-to-abate marine space when it comes to reducing greenhouse gas emissions. Their plug-and-play solution has enormous potential to also help other sectors, and we look forward to supporting them in their journey."

Peter van Giessel, Investment Director, Shell Ventures – 29th Of October 2021.

Shell Ventures

Daphne Technology's innovative approach has the potential to become a pivotal technology for the maritime industry. The ability to capture emissions from hydrocarbon maritime fuels and meaningfully reduce emissions in the short-term is a critical component of the industry's transition to net zero emissions, in which multiple fuels and multiple abatement solutions will be required. This investment fits well with our strategy to invest in and develop technologies and business models that will be required for the transition to net zero."

Margaux Moore, Head of Energy Transition Research at Trafigura - 29th Of October 2021.

TRAFIGURA

"We see Daphne's technology as having the potential to provide significant benefits to the global shipping industry - both environmental and economic- in light of the imminent IMO 2020 regulation. We are proud to include Daphne and its team as members of the SAEV portfolio."

Richard Riggs of SAEV Europe – 20th Dec 2018.

saudi aramco energy ventures

Visit https://daphnetechnology.com/about/partnerships for full set of our partners and supporters.

AWARDS & ACHIEVEMENTS

At Daphne Technology, we strive for excellence and are enormously grateful every time our team's extraordinary work is recognised

Winner of Ocean Solutions Awards at Nor-Shipping 2022.

Ranked Top 10th Swiss startup in 2022.

Winner of the Maritime Innovation Award at Envirotech for Shipping Forum 2021.

2020 - SulPure™ by Daphne Technology received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 946288.

European Commission
Horizon 2020
European Union funding
for Research & Innovation

Visit https://daphnetechnology.com/about/awards-recognitions for full overview of all awards and recognitions.

CONTACT US

A global presence

Daphne Technology is based in Switzerland, with subsidiaries in Norway and Sweden. We also have a local presence in Romania, Dubai, and Singapore, to be close to the industries, markets, and customers we serve in many different parts of the world.

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Lausanne, Switzerland
daphnetechnology.com/contact

info@daphnetechnology.com

@Daphne Technology

@DaphneTech

PUBLIC

Thank You

for your attention!