

ANGARA Global

EIS eligible United Kingdom company

The Winner: DIGITAL INNOVATION - 2024

World's Top 15
in AI + Carbon  crunchbase

 ASIAN
DOWNSTREAM SUMMIT

Winner

 TechTour Energy Transition

400 million tons of
CO₂ reduction


DNV

We are building the Palantir for the Process Industries

Enabling industrial assets to self-optimize, improving profitability above their base-line performance with AI

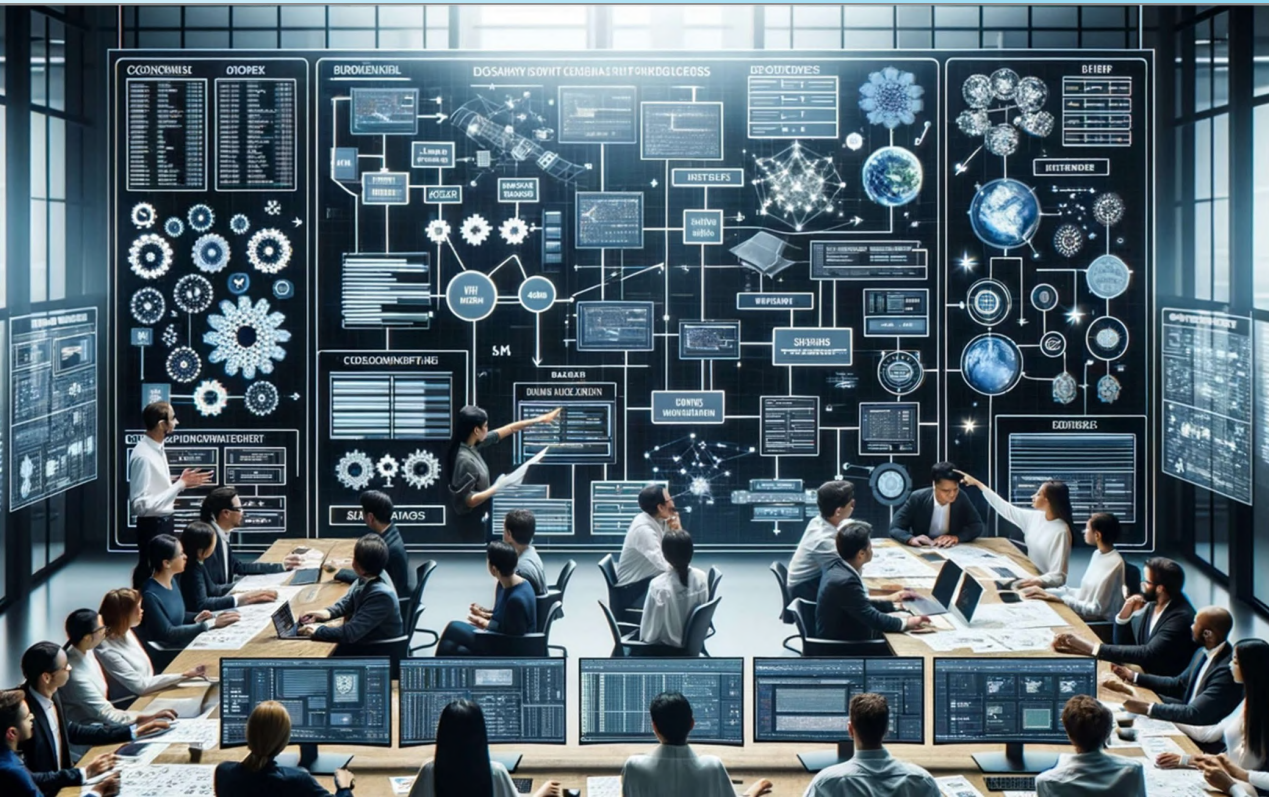


United Nations
Global Compact

Our DecarbonX technology platform increases asset productivity

by enabling assets to
think, communicate,
take care of themselves...

- dynamically
- beyond their baseline performance
- through AI-driven self-optimisation



Built on vast proprietary data sets
we have built over the last 9 years:

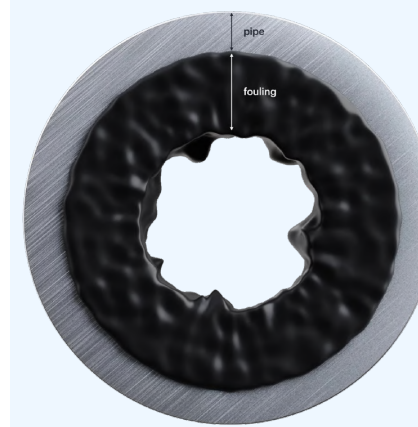
- several million of hours of data series
- on 14 thousand equipment units.

\$100 billion in costs and 1 billion tons of CO₂ emissions

Zillions of heat exchangers

- Food
- Water
- Biofuels
- Refining
- Fertilizers
- Chemicals
- Geothermal
- Agriculture
- Petrochemicals
- Power Generation

Across many industries



Fouling acts as a barrier to efficient heat transfer

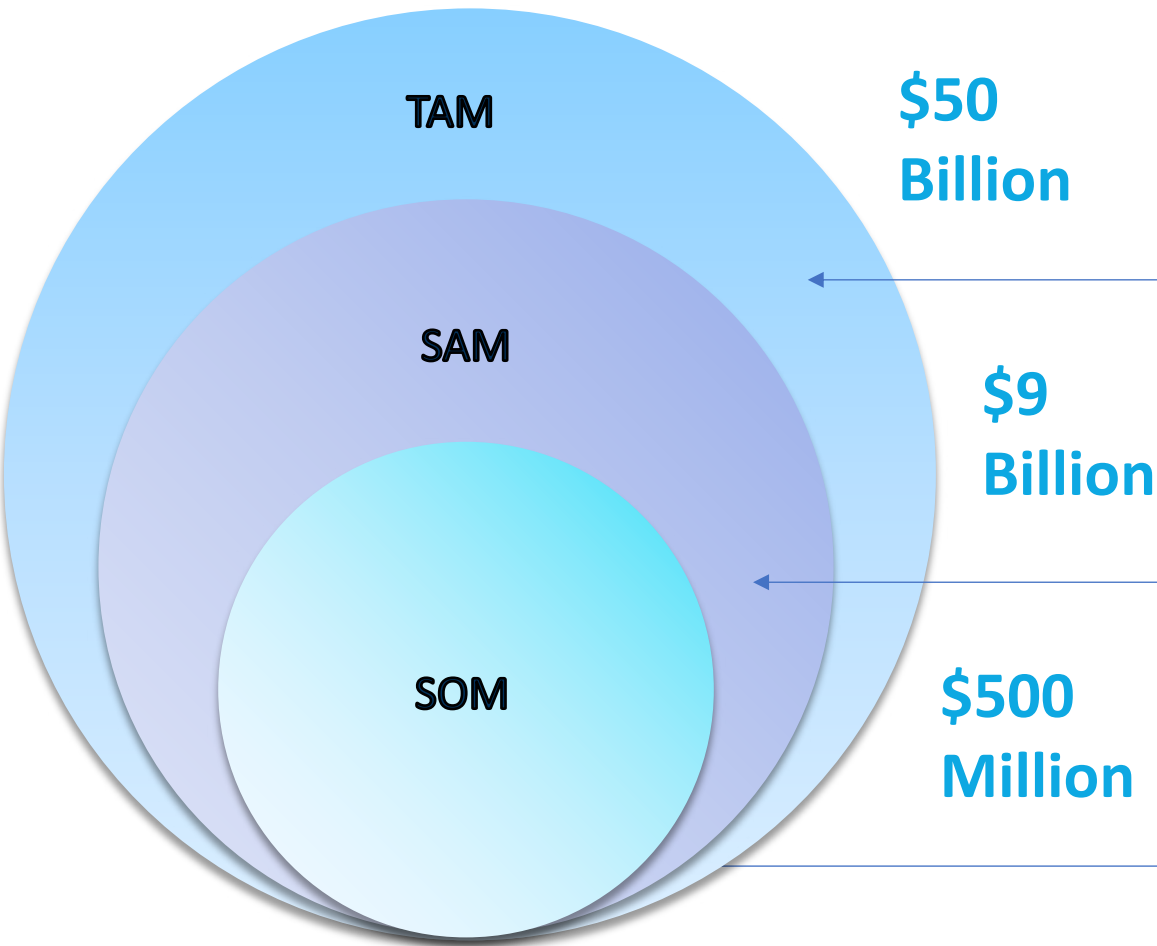
Negative consequences include:

- Equipment failure
- Reduced product yield
- Excessive fuel consumption
- Reduced production due to increased maintenance



Big market opportunity

The market estimate for services to eliminate fouling-related efficiency losses



The world-leading technical assessment and internationally accredited registrar DNV confirmed our technology's its potential



Risk status key		None	Minor	Medium	High
Brief description of the risk		No material risk identified and no mitigations required.	Risk identified that has been mitigated, or where risk level is low.	Risk identified that will require mitigation. Risk may be material.	Potential major impact. Mitigation is required.

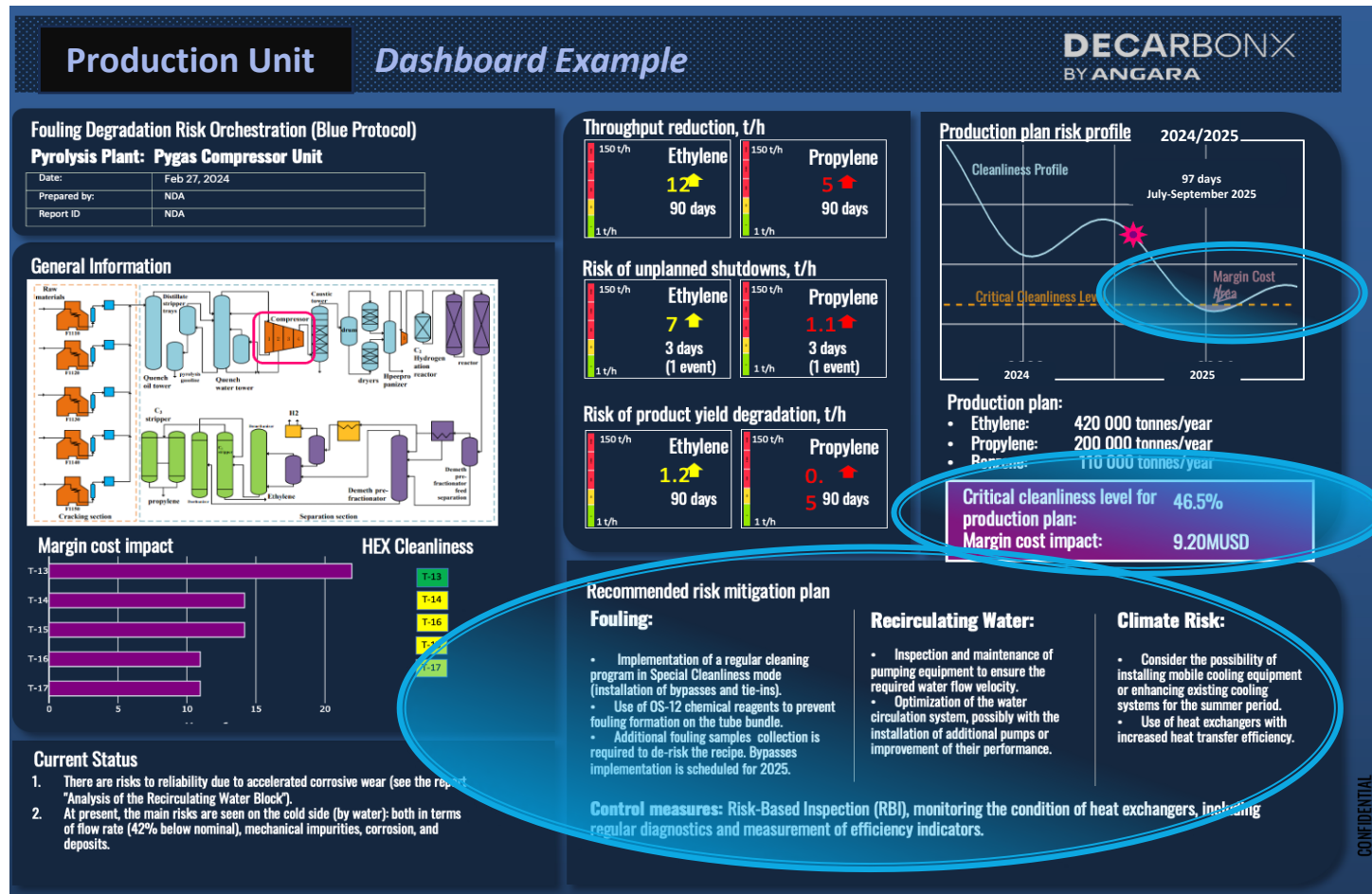
No	Claim	Cat	No	Claim	Cat	No	Claim	Cat
1.1	Fouling fracturing technology is efficient to clean various types of heat exchangers		1.4	Fouling fracturing technology is safe for equipment		3.1	Cleaning jobs do not pose significant or additional HSE risks compared to conventional cleaning methods	
1.2	Fouling fracturing technology has performance advantages over hydro jetting		1.5	Cognitive Cleaning / fouling fracturing enables hardware upgrades in the crude refinery		3.2	Cognitive Cleaning can help the crude refining industry to avoid up to 400MM tonnes of CO2 emissions per year	
1.3	Cognitive Cleaning allows to improve product yields		2.1	Angara's business model allows fast scale up to meet surging clients' demand through its outsourcing route				
			2.2	Angara's patents and applications protect Fouling Fracturing and Cognitive cleaning technology in various target markets				

Annual CO₂ emissions abatement potential 400 million tons

Report details	
Report title:	Technical Assessment of Cognitive Cleaning
Report Number:	ESNL222824
Date:	24 January 2022
Project Number:	10324357
Project team	
Author:	Vincent Zwanenburg
Verified:	Robert Mellema
Approved:	Johan Knijp

We deliver actionable insights on a recurring basis

The dashboards and actionable reports are automatically generated by our AI-powered digital tools and sold as Analytics-as-a-Service on a subscription basis, so clients can act on them



Our actionable insights are distinguished by



Superior Accuracy

in predictions and recommendations



Extended forecasting horizons

Clients have enough time

- to make decisions,
- to prepare actions,
- to execute.

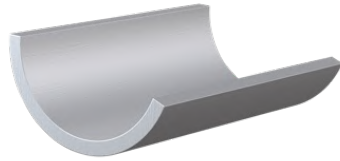


Automated generation of practical dashboards and actionable reports

- to reduce costs,
- to improve margins,
- to increase reliability and safety.

Some important actionable insights are underpinned by our proprietary technology that makes them a practical reality

Patented Fouling Fracturing Technology in US, EU, KSA, FSU, etc.



Step 3



Step 2



Step 1

Super-fast in situ non-disassembly fouling removal

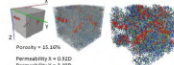


Angara licenses its patented process & formulations

1.1 Chemical Characterization



1.2 Geomechanical Characterization



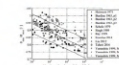
1.3 Structural Characterization



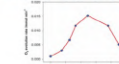
2.1 Geomechanical Properties



2.2 Fatigue Data Analysis



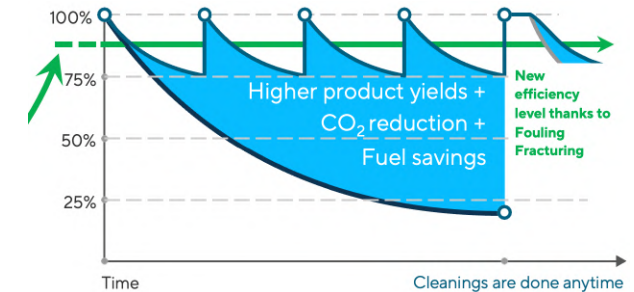
2.3 Fouling Fracturing Design



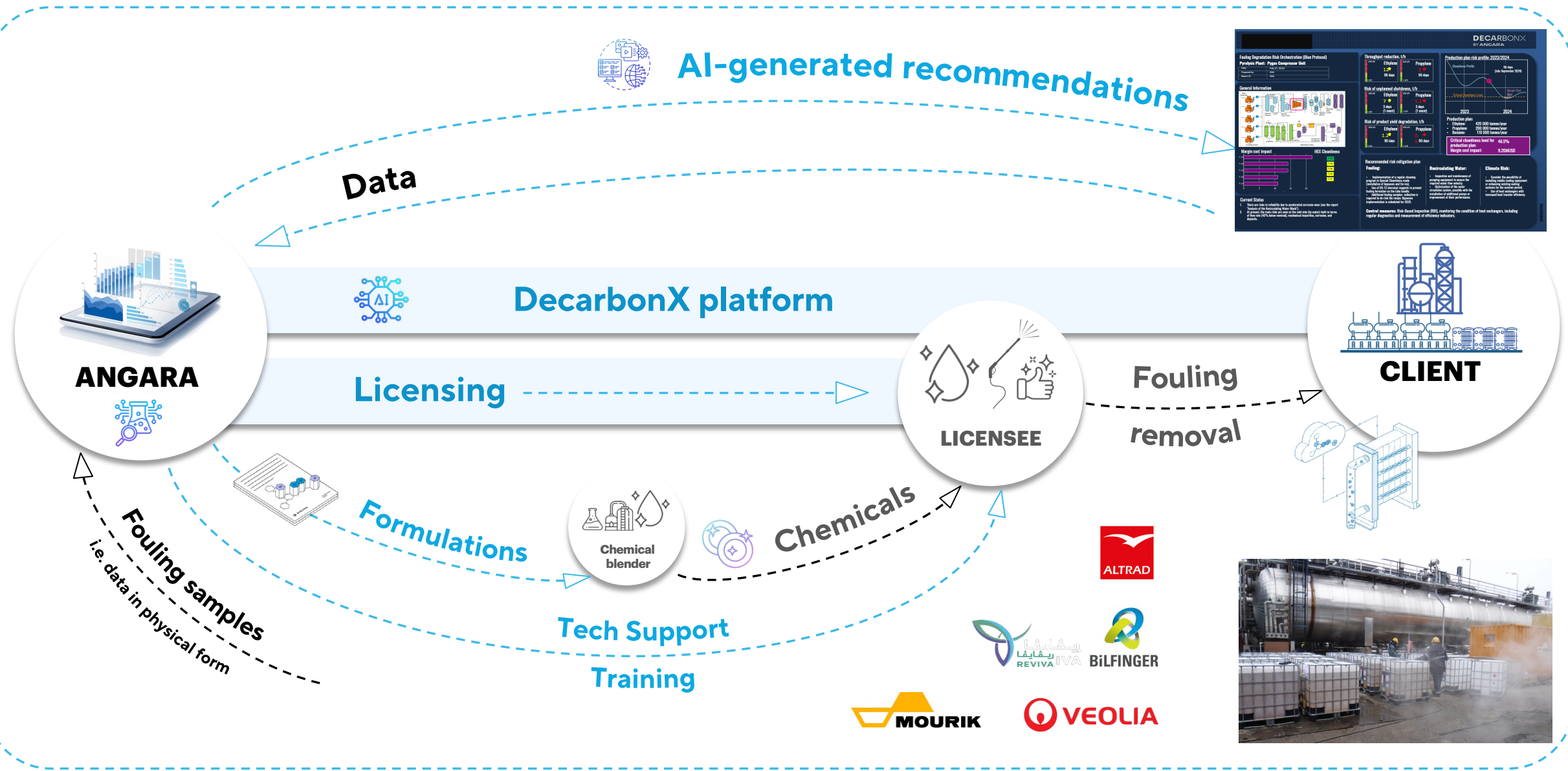
Heat exchangers continuously clean and much more efficient

✓ 2-7 TIMES FASTER

✓ ANYTIME



We market our DecarbonX AI directly, while increasingly licensing our chemistry technology to incumbents



DecarbonX AI analytics is sold on subscription

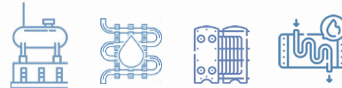


*Delivering actionable insights
on a recurring basis*

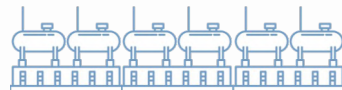
The total cost depends on the amount of equipment and class of service:

1. Equipment Unit Level

Unit-specific Class of service



Number of units



2. Production Unit Level



3. Plant Level



Examples of pricing levels:

*A refinery can have 200 – 800 units
A petrochemical plant - 250 – 5,000 units*

\$500 – 15,000 / year

\$30,000 - 500,000 / year

A plant can have 10-30 production units

\$250,000 – 3,000,000 / year

*There are 825 refineries and 3,243 active
petrochemical complexes plus 706 planned*



Awards, honors, recognition, validation

Annual CO₂
reduction potential
validated:
400 million tonnes



Appraised IP portfolio
at \$23 million
42 granted patents:
USA, EU, KSA, FSU, Singapore

ANGARA GLOBAL SUSTAINABLE
FINANCE FRAMEWORK 2024

ANGARA



2019

- Finalist



- Finalist in Innovations -
Digital Technology



2020

- Finalist



- Top Three Startup
Company of the Year –
ADIPEC Energy Awards



2022

- Award Winner



- Finalist – the Rising Star



2023

- Selected to showcase
the technology at
COP28 UAE.



- The World's [15 best-funded startups](#) at the intersection
of Artificial Intelligence
and Decarbonization



2024

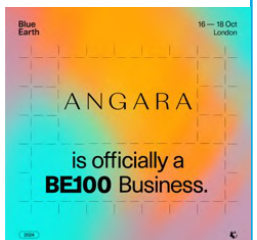
- **Winner:**
DIGITAL INNOVATION
- Sustainable Technology
of the Year - Finalist







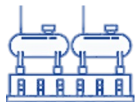
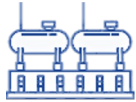

- Nominated to
FORBES AI 50 List 2024

Forbes SEQUOIA

- TOP 10
Scaleup
out of 1000+



Customers appreciate the big tangible benefits they get

	Unit	Customer Net Economic Impact	Action scenarios results
Enterprise	 Corporate Center of Excellence	\$200,000,000 of degradation risk portfolio management / year	Daily orchestration of ~1,000 equipment units Being rolled out to 11,700 equipment units DecarbonX - approved as a Standard Operating Procedure at an enterprise level (20+ plants)
Production Unit Level	 Pyrolysis furnaces	WIP	Increased throughput
	 Pygas compression	\$7,300,000 / year of additional margin	Increased product yield
	 Water recirculation	\$4,000,000 / year of additional margin	Increased product yield
Equipment Unit Level	 Heat exchangers	\$3,200,000 / year in savings	Savings on equipment replacement costs
	 Heat exchangers	\$1,300,000 of additional margin	Increased margins
	 Heat exchanger	\$500,000 / year of additional margin	Increased product yield

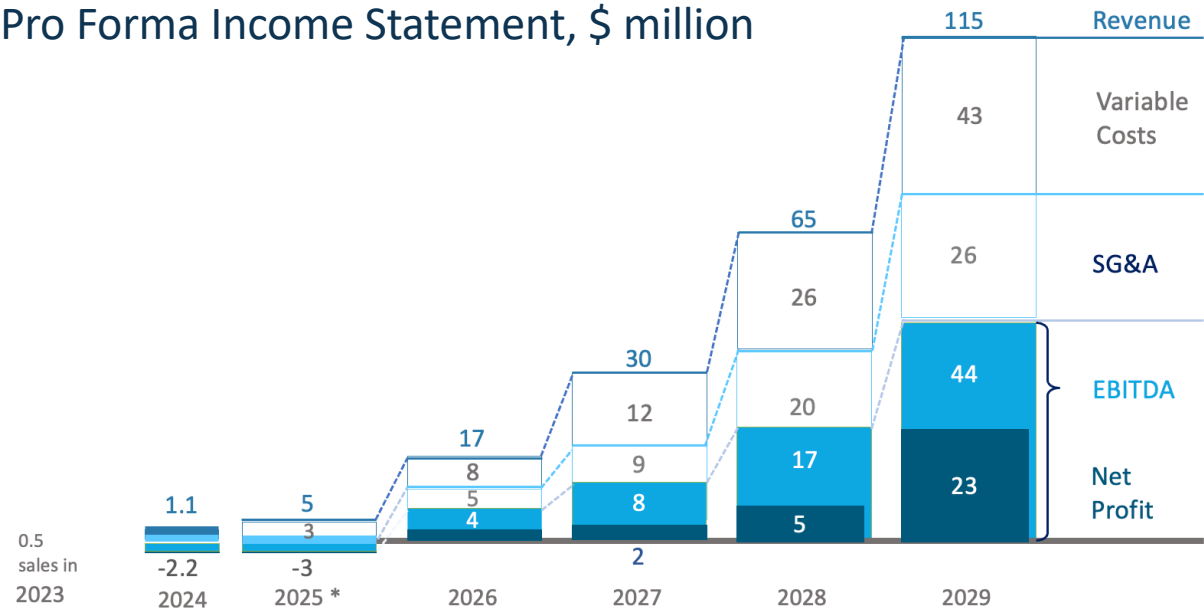
Proven Market Fit and Solid Traction to Profitability in 2026

Units under DecarbonX subscription	Gross Margin at scale
<ul style="list-style-type: none"> Equipment Units 1200 Production Units 4 Plants 3 	>70%



ANGARA is part of J.P. Morgan’s Green Economy Banking

Pro Forma Income Statement, \$ million



Our Clients and Prospects Include

Multiple Markets

DECARBONX
BY ANGARA

**Already used
commercially in:**

Is in pilot or planned:



Refining



**Chemicals
Petrochemicals**



**Food
Fertilizers
Agriculture**



**Biofuels
Plastics recycling**



Water



**Geothermal
Power gen**

ANGARA's Professional and Dedicated Team



Val Krivenko
Executive Chairman,
Co-Founder



BRIGHT CAPITAL

Managing Partner

McKinsey
&Company

Roland
Berger



Mutlaq H. Al-Morished
Senior Advisor.
Non-Executive Director from Apr'25



TASNEE

Board Director - currently

CEO, 2015 - 03/2024

سابك
عابك

CFO, 2004 - 2015

citi

Board Chairman, KSA - currently



Alex de Valukhoff
CEO,
Board Director



aggreko

Managing Director, Eurasia

Global Sector Lead, Oil & Gas

LAFARGE

Country CEO



Peter Petrov
Deputy CEO, Co-Founder
Board Director



Morgan Stanley Executive Director

BARCLAYS

Executive Director



Ed Cherednik
Chief Digital Officer,
Co-Founder



IBM

Digital Transformation Executive

HALLIBURTON

Account Executive

AECOM

VP for Oil & Gas

IHS Markit

Regional Manager



Panos E. Cavoulacos PhD
Non-Executive Director,
Senior Advisor



HELLENIC
PETROLEUM

CEO and Board Director

Schlumberger

MD, Business Consulting Asia

europa

Chairman of European Petroleum
Industry Association

Booz | Allen | Hamilton

Partner

McKinsey
&Company

AP



Jaap Kalkman PhD
Non-Executive Director,
Senior Advisor



ADQ

Group Chief Investment Officer

ADL
Arthur D Little

Managing Partner, Head of
Global Energy & Utilities Practice

Roland
Berger

Head of Energy and PE
practice, ME

McKinsey
&Company

Partner, Head of Bahrain





































Ilia Rodin
Chief Development Officer, Co-
Founder, Board Director



FPI

Partner

The Board of Advisors Supports the Team (partial list)

 <p>Alec Saltikoff Sustainability and Energy Efficiency</p>  <p>JPMorganChase Global Head of Sustainability and Energy Vice-Chairman</p>  <p>Co-Chair of Sustainability Committee</p>  	 <p>Boris Shrayar Business Development</p>  <p>Morgan Stanley Head of Commodities Client Marketing, Strategy, and Research, MD</p>  <p>MD</p> 	 <p>Occo Roelofsen Strategy</p>   <p>McKinsey & Company Senior Partner, Global Leader of Global Oil & Gas Practice</p>  <p>Chairman</p>  <p>Committee for Entrepreneurship and Financing</p>	 <p>Leo Mukhamedov Digital</p>  <p>Schneider Electric Chief Strategy Officer, EVO Europe, Member of the Executive Committee</p> <p>Schneider Electric Vice President for CIS, ME and Africa, IT BU</p>
 <p>Martin Jagger Energy Transition</p>   <p>ADNOC VP Economics & Business Intelligence</p>  <p>General Manager Carbon Capture</p>	 <p>Christophe Gerard, MSc Geothermal</p>   <p>SELVINO INVESTMENTS LTD Director & COO</p>  <p>Reservoir Engineering</p>  <p>Engineer</p>	 <p>Miray Zaki, PhD Investments</p>   <p>COP20UAE Senior Advisor - Private Sector, Food Security, Climate Finance</p>  <p>Managing Director – Head of Sustainability & Head of Africa</p>  <p>Chair – North America & Europe</p>	 <p>Toby Gati ESG</p>  <p>THE WHITE HOUSE Special Assistant to the US President</p>   <p>SVP</p>

Investment Opportunity

Investors have the following options:

1. **Buy shares** in Angara Global Ltd. (UK, EIS eligible): **from \$2 mln. to \$10 mln.**

or

2. **Invest** via Convertible Loan at 10% p.a., 20% discount, \$50 mln. pre: **from \$50k – \$2 mln.**

or/and

3. **DecarbonX Secured ISIN Note** at 10% p.a., 3 years: **from \$100k to \$10 mln.**

backed by our intellectual property as collateral. Available in February

- The base interest will be at 10% p.a. plus net profits participation. The resulting yield can be up to 38% p.a. in year 2 or later.
- The IP, consisting of 42 patents appraised at a minimum of \$23 million (my Metis Partners), serves as collateral.
- The Note will be an ISIN instrument and registered on the Vienna Stock Exchange.
- The duration is 3 years plus one or two years at the issuer's choice.

ANGARA GLOBAL SUSTAINABLE
FINANCE FRAMEWORK 2024

ANGARA



The EXIT:

Stage 1 - over a 2-year horizon

- Interim / partial EXIT –
as a sale of Fouling Fracturing technology stack
- ANGARA has an IP portfolio of 42 granted patents.
- **Potential \$100-250 million.**

Stage 2 - over a 3–5-year horizon

- Full EXIT –
as a sale of the business based on DecarbonX,
our digital AI platform.
- **Potential \$1-2 billion.**

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Contact Information

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Executive Chairman



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www.angaraglobal.com

DECARBONX
BY ANGARA

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