



ENVIRONMENT & SUSTAINABILITY

Andre Argenton

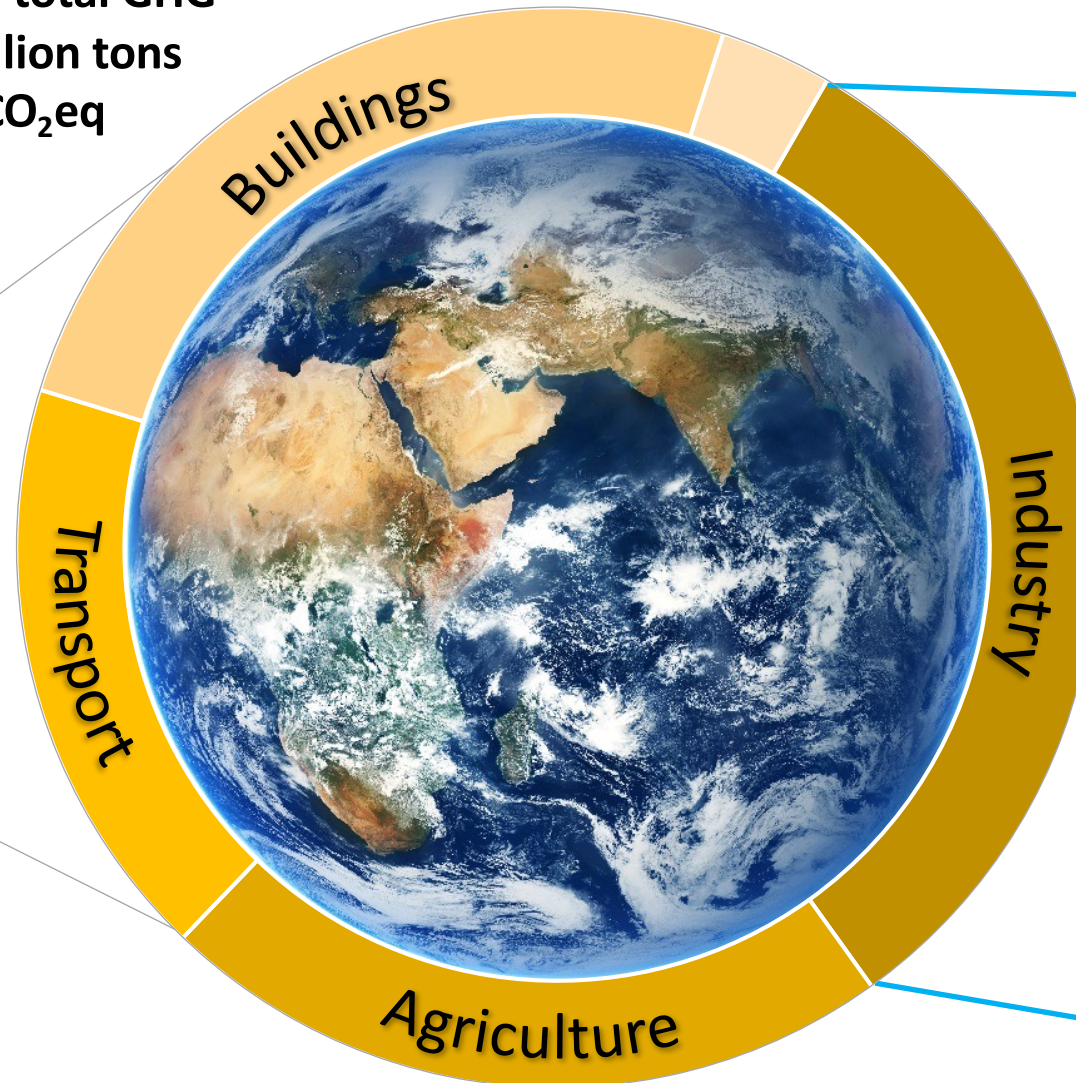
Chief Sustainability Officer

VP of Environment, Health & Safety

GLOBAL GREENHOUSE GAS EMISSIONS

For Paris Climate 2°C goal (carbon neutral by 2050) How to decarbonize chemical industry?

Global total GHG
51 billion tons
CO₂eq



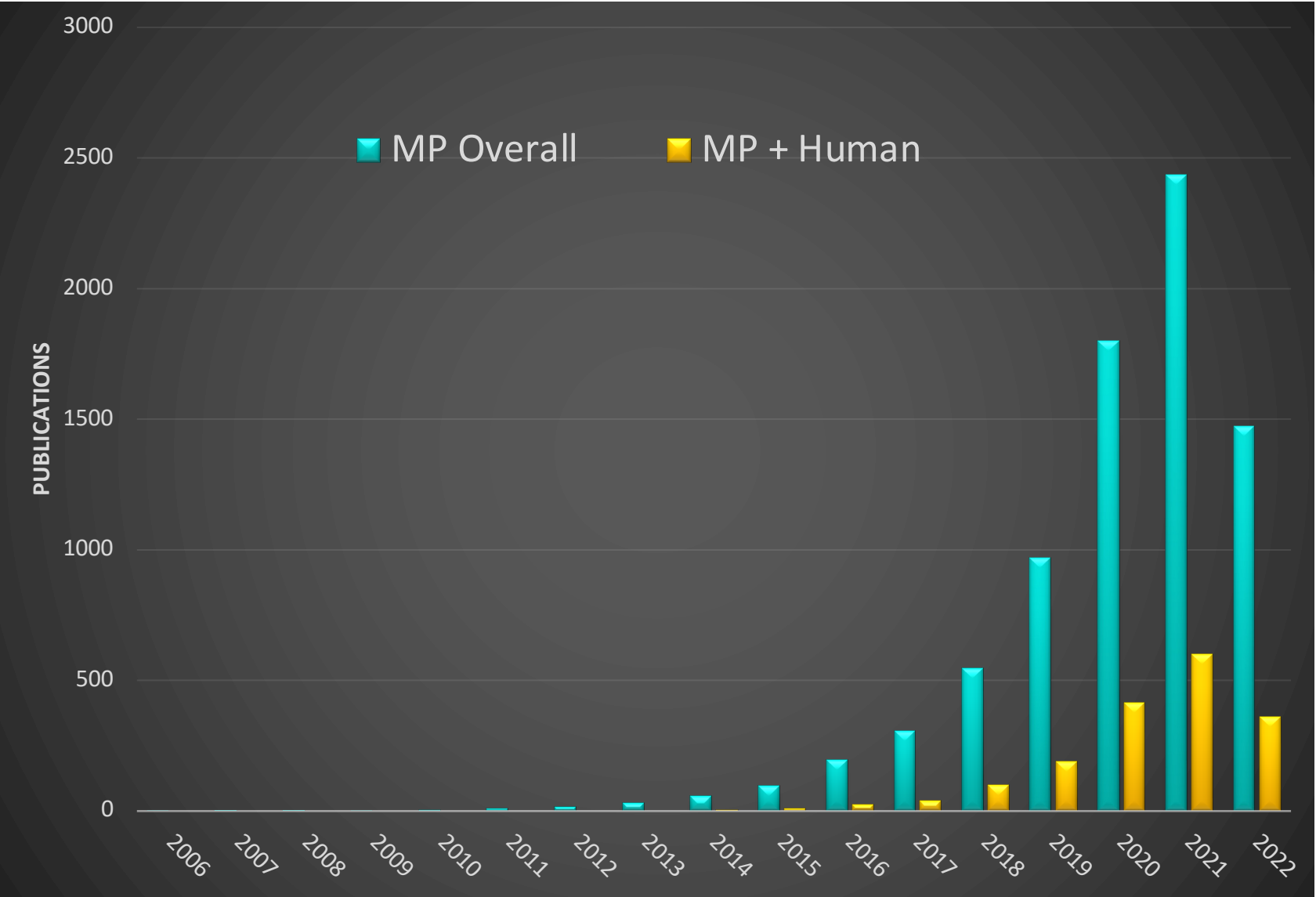
Chemicals contribute to
6.1% of global GHG
emissions

Steel contribute to
5.9% of global GHG
emissions

Cement contribute to
5.5% of global GHG
emissions

All other industrial
sector contribute to
14.5% of global GHG
emissions

MICROPLASTICS UNDER ANALYSIS



INCREASED REGULATORY FRAMEWORK COMPLEXITY



ESG REPORTING: STAKEHOLDER INFLUENCE

INNOVATION

ESG Is Here And There's No Turning Back



Julie Iskow Forbes Councils Member

Forbes Technology Council COUNCIL POST | Membership (Fee-Based)

Jan 11, 2022, 08:00am EST

ESG | 6 April, 2022

Regulations are pushing investors to embrace ESG

Numerous surveys show that regulations are increasingly forcing investors to embrace environmental, social and governance criteria across all of their activities.

INVESTMENT MONITOR

Securities and Exchange Commission or Securities and Environment Commission? The SEC Proposes New Rules for Climate-Related Disclosures

Friday, March 25, 2022

NATIONAL LAW REVIEW

FINANCE > REPORTING AND DISCLOSURE | 7 April 2022

Investor climate action gains momentum – but is it fast enough?

The SEC's proposal to force US companies to disclose their emissions data is indicative of an accelerated investor-driven climate action agenda.

By Oliver Gordon

ENERGY MONITOR

Executive Pay Tied to ESG Goals Grows as Investors Demand Action

Bloomberg Law

Investors push 10,000 companies to disclose environmental data to CDP

By Simon Jessop



ESG RATINGS COMPARABILITY

Correlations between ESG Ratings

	MSCI to SA	MSCI to Refinativ	MSCI to SAM CSA	SA to Refinativ	SA to SAM CSA	Refinativ to SAM CSA
ESG overall	0.46	0.38	0.38	0.67	0.67	0.62
E	0.37	0.23	0.29	0.64	0.66	0.7
S	0.27	0.27	0.26	0.55	0.55	0.65
G	0.16	0.07	0.11	0.49	0.51	0.79

MSCI = Morgan Stanley Capital International

SA = Sustainalytics

SAM CSA= S&P Global Corporate Sustainability Assessment

Berg et al., Aggregate Confusion: The Divergence of ESG Ratings, *Review of Finance*, 2022; <https://doi.org/10.1093/rof/rfac033>



INtersections

2021 ENVIRONMENTAL, SOCIAL & GOVERNANCE REPORT



2021 ACTIONS

Announced plans to build the world's **1st net-zero carbon emissions integrated ethylene cracker** and derivatives site in Fort Saskatchewan, Alberta, Canada, while tripling the site's manufacturing capacity

CO₂ savings:

>1MM MTA¹

Shared a multi-generation plan to convert our Terneuzen manufacturing site in the Netherlands to use clean energy from a **new hydrogen plant**

CO₂ savings:

1.4MM MTA¹
(phase 1)

Expanded access to renewable power to

>900 MW capacity

Advanced retrofit of proprietary FCDh pilot plant in Louisiana for planned 2022 start-up

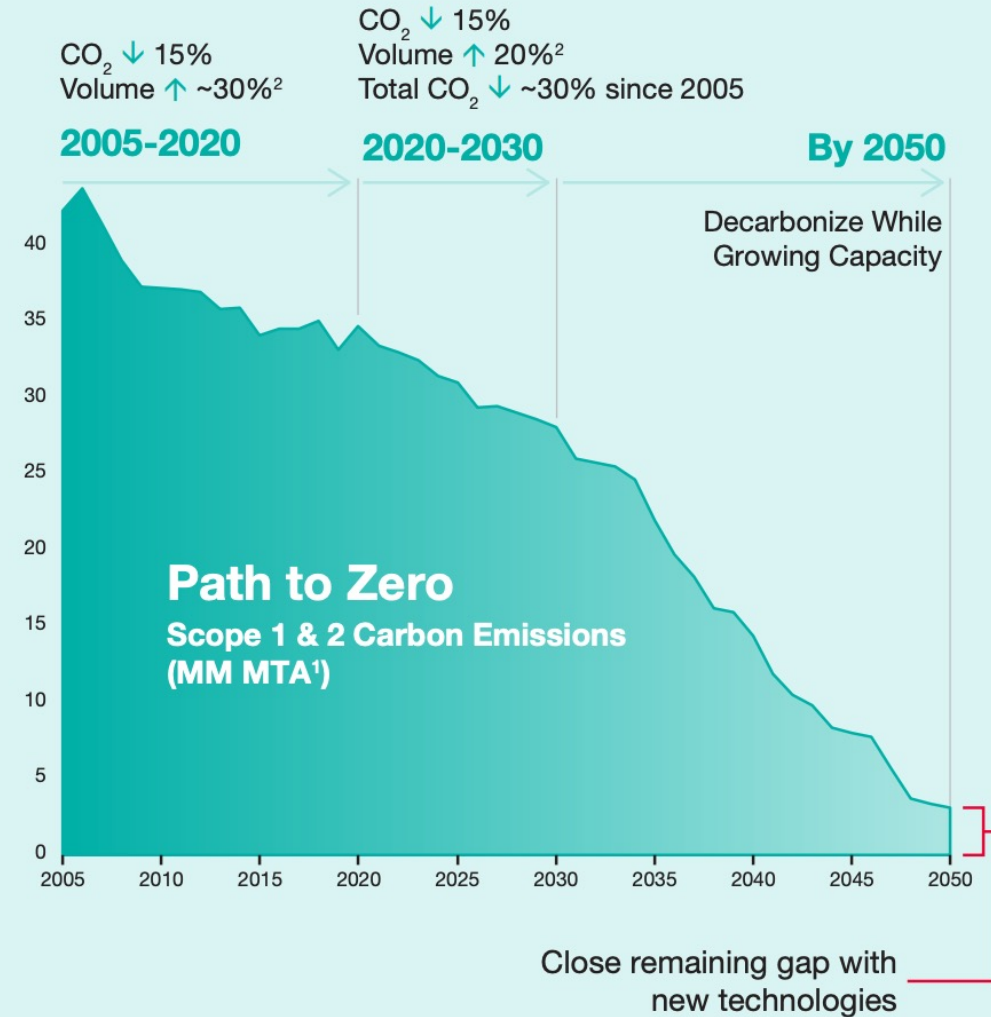
20% CO₂ reduction vs. traditional processes

Collaborated with **>100** suppliers to drive transparency on Scope 3 carbon emissions and advance climate action with suppliers and non-governmental organization (NGO) partners

ecovadis

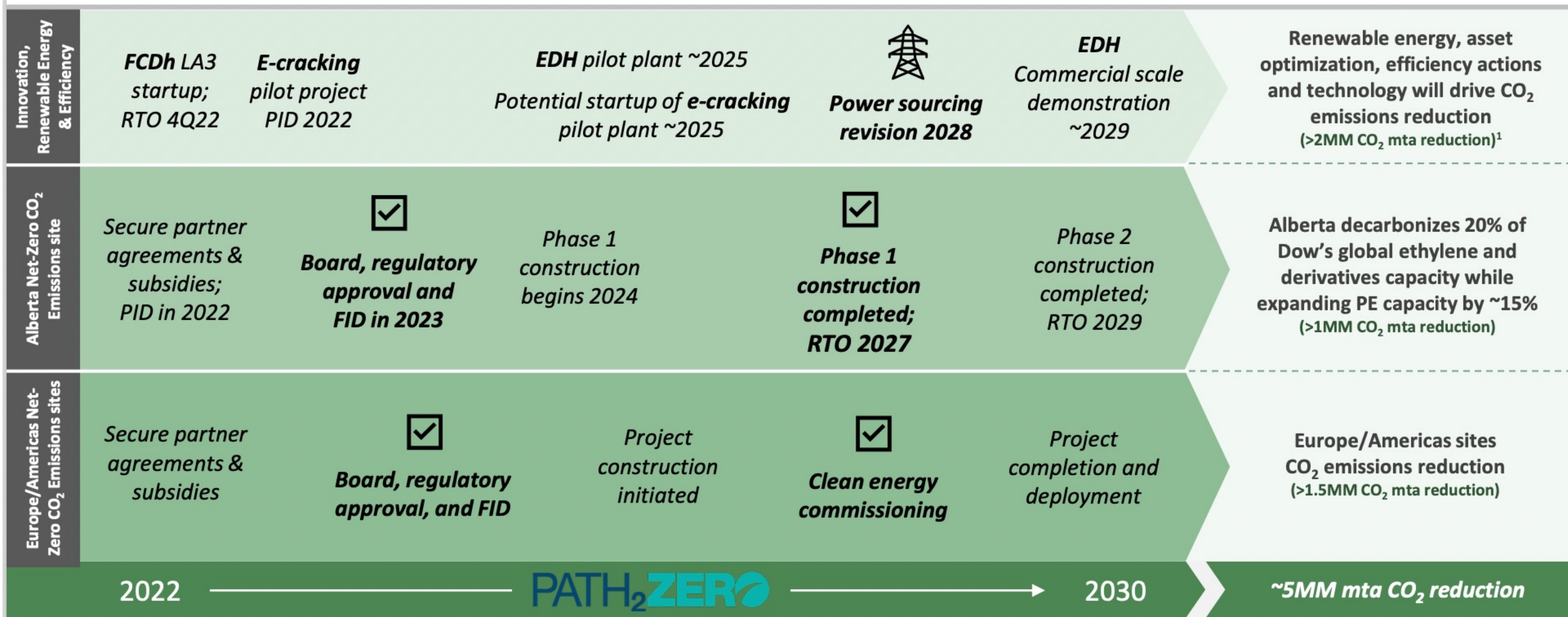


A Clear Path to Decarbonize and Grow



CLEAR MILESTONES SUPPORT OUR 2030 DECARBONIZE & GROW ROADMAP

Expect to grow capacity and underlying earnings by >\$3B/year while reducing CO₂ emissions by ~30%²



(1) The target presented expected to be achieved by projects currently in progress.

(2) Using 2005 as a baseline.

PID: Preliminary Investment Decision

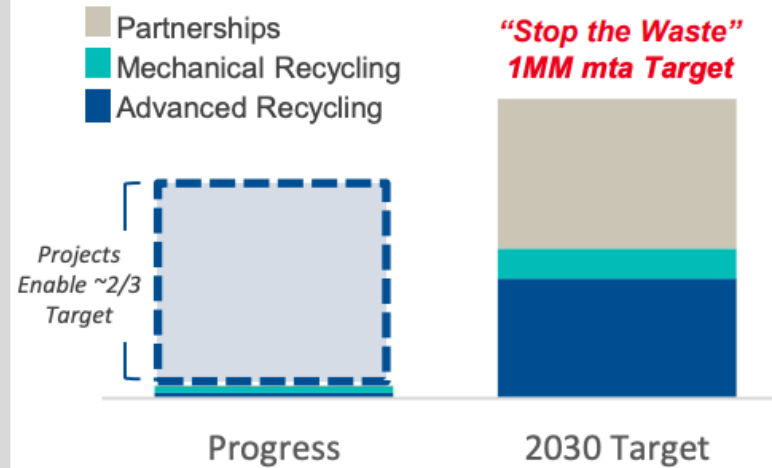
FID: Final Investment Decision

RTO: Return to Operations



ACCELERATING CIRCULARITY

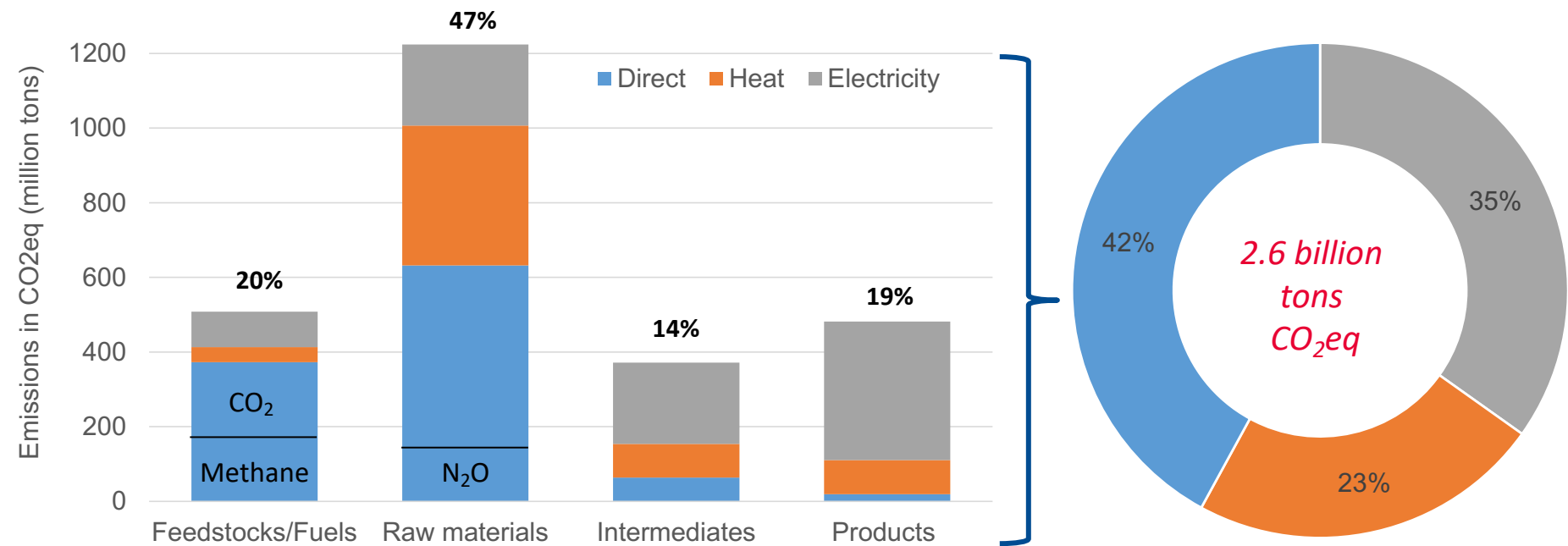
Accelerating Circularity Capability



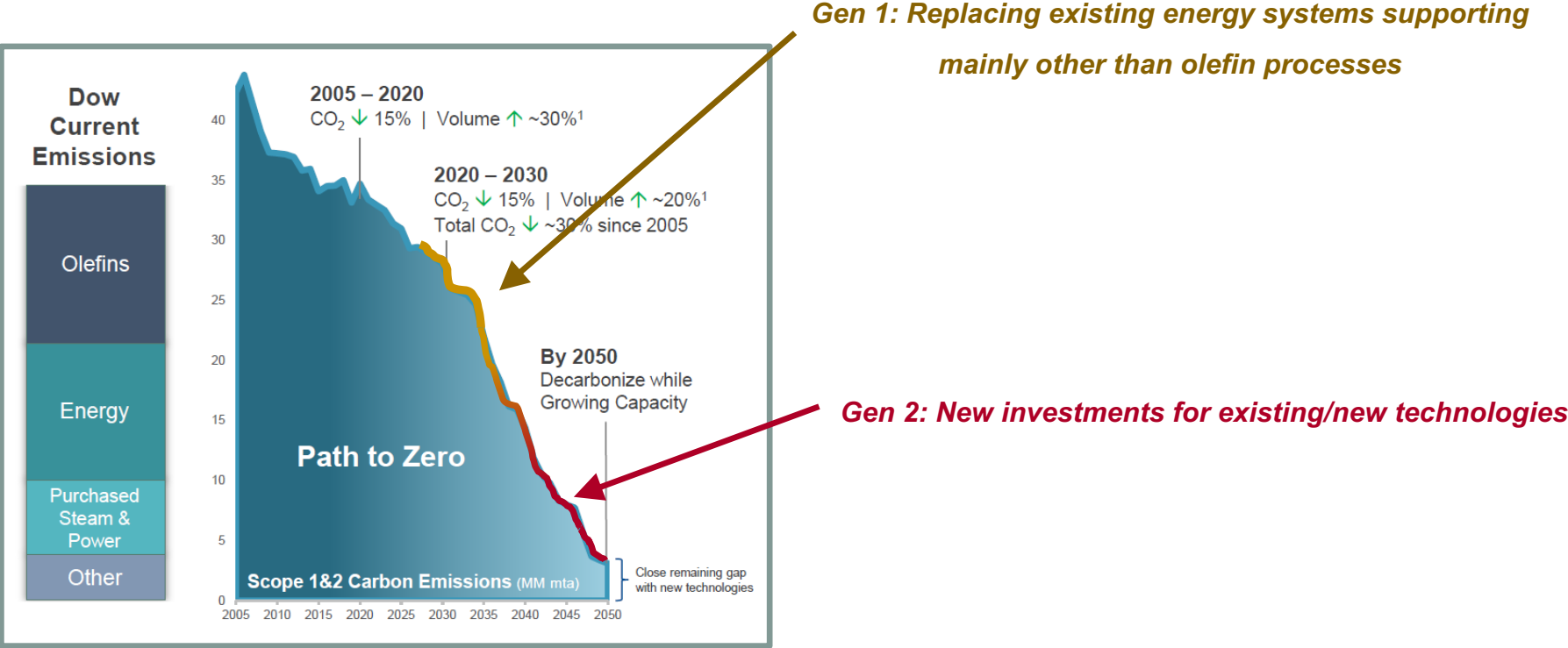
- Global pipeline of >20 strategic partnerships
- Expanding collaboration with Mura Technology to build advanced recycling facilities
 - Expect to add up to 600kta plastic waste recycling capacity by 2030 in U.S. & Europe
 - New circular polymer will serve fast-growing brand-owner demand across market verticals
- Adding mechanical recycling capability through collaboration with Valoregen in France

SMALL MODULAR NUCLEAR REACTORS CAN PLAY ROLE IN DECARBONIZATION

GHG EMISSIONS OF CHEMICAL INDUSTRY



SMALL MODULAR NUCLEAR REACTORS CAN PLAY ROLE IN DECARBONIZATION



OPPORTUNITIES IN OUR INDUSTRY

Length scale

10^{-11} m

10^{-10} m

10^{-7} m

10^{-5} m

10^{+6} m

From atoms to Planet Earth...



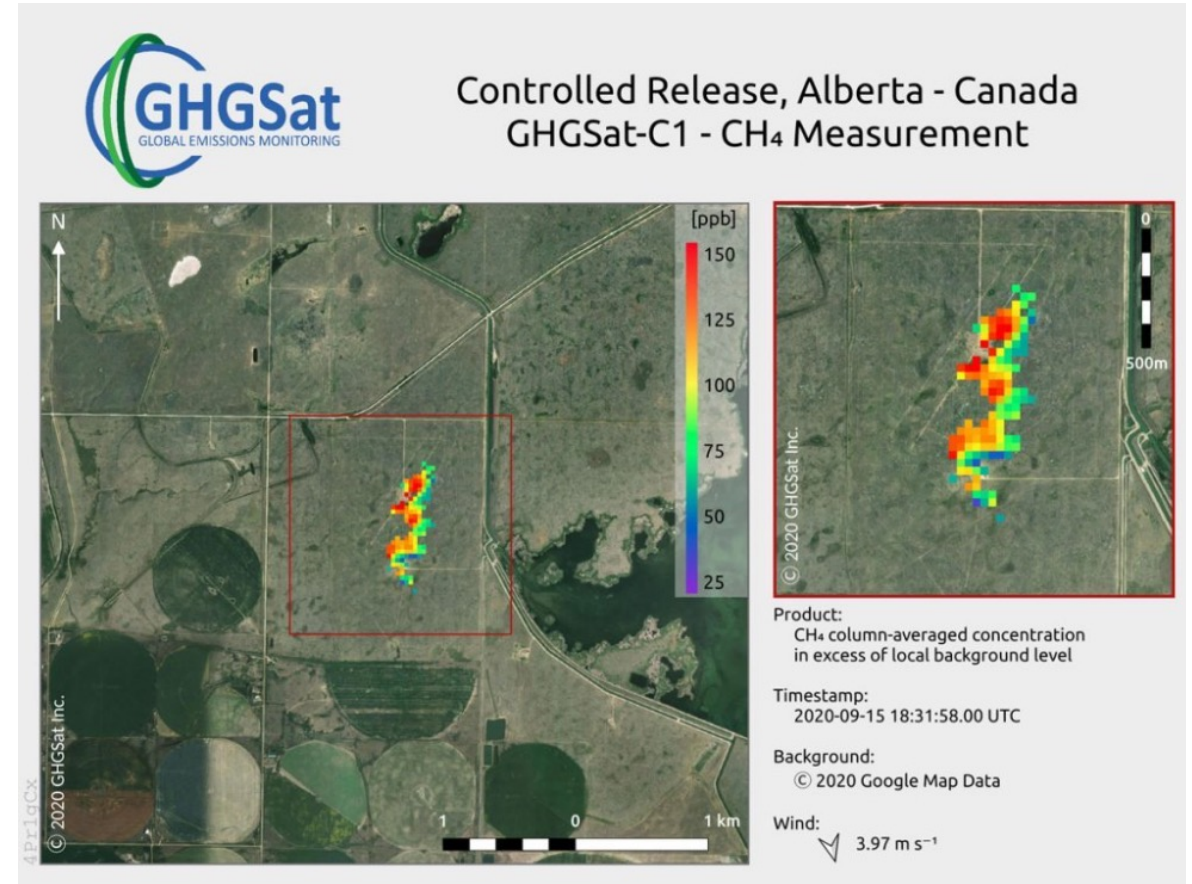
SATELLITE-BASED TECHNOLOGY

GHGSat / Newsroom / PRESS RELEASES / Smallest methane emission ever detected by satellite

PRESS RELEASE

Smallest methane emission ever detected by satellite

By GHGSat October 8 2020



THE NEW REALITY TO THE INDUSTRY

- Accuracy, resolution, specificity, sensitivity are needed...
...Impact is critical!
- Fundamental understanding of underlying physics is needed...
...pragmatic solution is critical!
- Domain specific knowledge is needed...
...multidisciplinary integration is critical!
- Isolation and individualization of problems is needed...
...impact at system level is critical!



Seek

Together™