Large-Area Graphene Oxide Composite Membranes: Enabling Breakthrough Cleantech Applications

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Cooling solutions are warming the World

Buildings account for 40% of global GHG emissions

Over 50% of building cooling energy is used to reduce humidity, not temperature[1]

(1) On average, globally - *Humidity's impact on greenhouse gas emissions from air conditioning*. J. Woods, *et. al.* Joule 6, 726–741, April 20, 2022

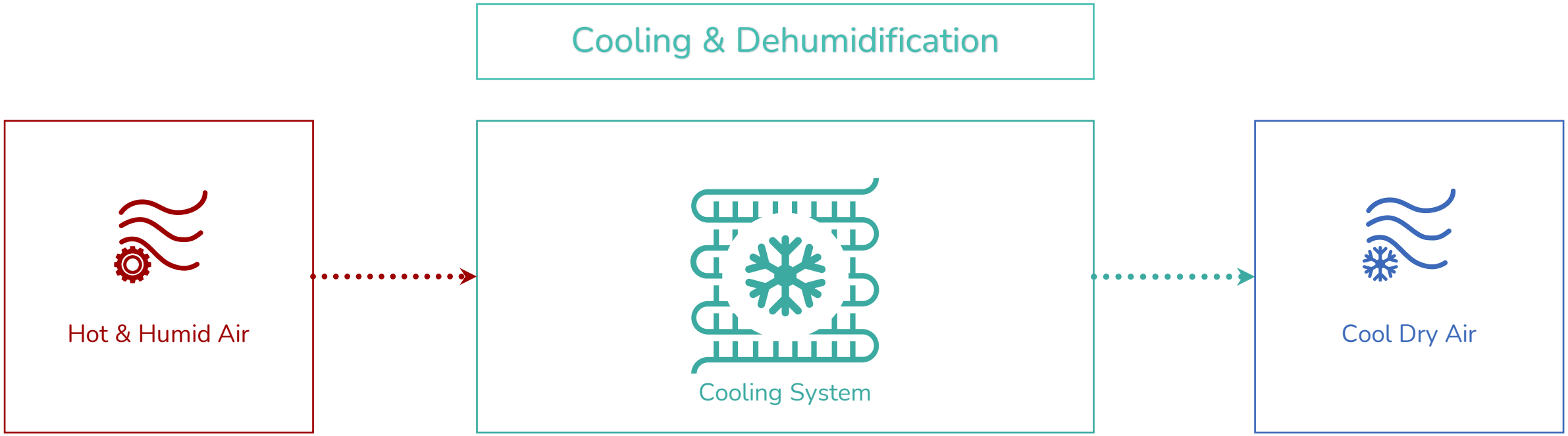
Solution

Evercloak Membrane Dehumidification

Impact

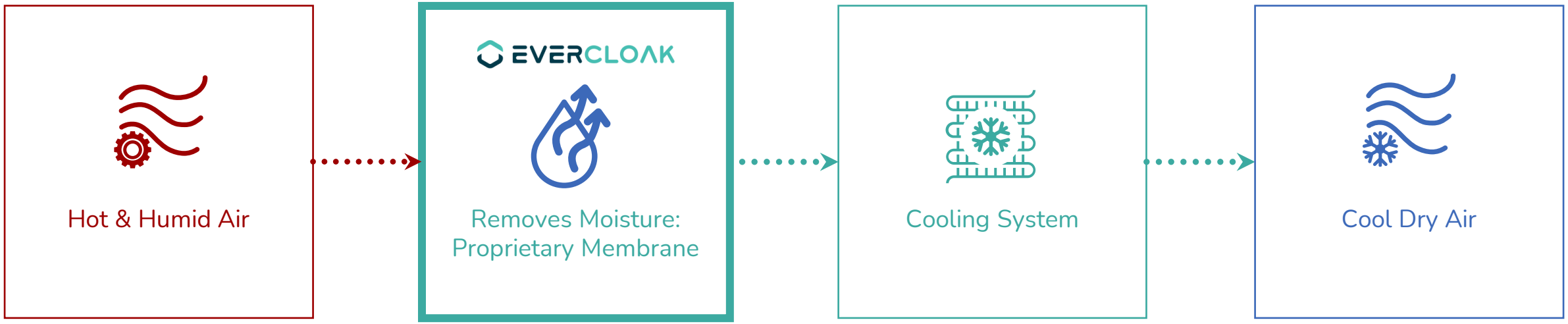
50% energy savings
0.6 Gt/per year reduction of GHG by 2050

Traditional Building Cooling



Evercloak's Advantage

Efficiency gain



Reduce GHG

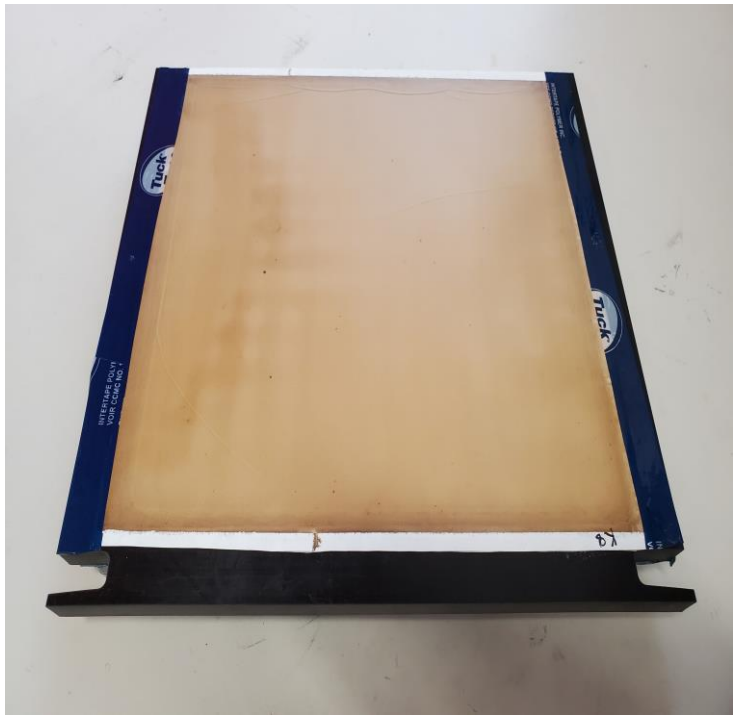
Reduce Opex

Reduce Capex

Evercloak Dehumidification Test Unit

World's first graphene oxide membrane-based dehumidification system installation!

> 4000 hrs operation



Enabled by Evercloak's proprietary membranes

Market Opportunity

$206B
Heating, Ventilation & Air Conditioning (HVAC) Equipment Market[1]

Prong 1
Membrane sales

Evaporative cooling

$5.8B, 6.2% CAGR[2]

Prong 2
System component manufacturing and sales

Dedicated Outdoor Air Systems (DOAS)

$4.8B, 9.0% CAGR[3]

Cold Storage

$48.4B, 6.5% CAGR[4]

Evercloak Membranes

Evercloak Dehumidification Systems

High market growth and technology need

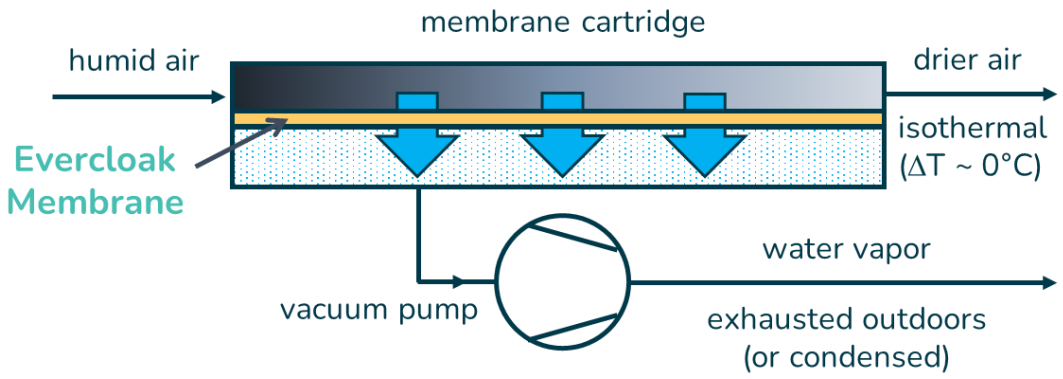
(1) HVAC System Market, MarketsandMarkets, April 2023; (2) Evaporative Cooling Market Analysis, Coherent Market Insights, January 2023
(3) Dedicated Outdoor Air System (DOAS) Market, Future Market Insights, February 2024; (4) Cold Storage Equipment Market Siæ, Global Market Insights, July 2023

Dehumidification Technology Comparison

	Evercloak	Desiccants	Condensers
Technology	Membrane dehumidification	Chemical absorption / desorption (regeneration)	Vapour compression refrigerant systems (direct expansion)
Operating Temperature Efficiency A Zone: >30°C B Zone: 0 to 30°C Cold Storage: <0°C	● ◒ ◒	◔ ◒ ○	◒ ◒ ◔
Performance (A Zone, higher is better) Moisture Removal Rate (lb/h/1000 CFM) Moisture Removal Efficiency (MRE, lb/kwh)	 34 8	 31 1.7	 30 4
Chemicals	None	Requires desiccants	Requires refrigerants (high GHG contributors)
Heating	None	Required for desiccant regeneration	Required to raise temperature after humidity removal
Cost CapEx OpEx	 $$ $	 $$ $$	 $ $$
Example Companies	EVERCLOAK	Munters, transaera, BLUE FRONTIER, MOJAVE	DAIKIN, Carrier, EMERSON, TRANE, Johnson Controls

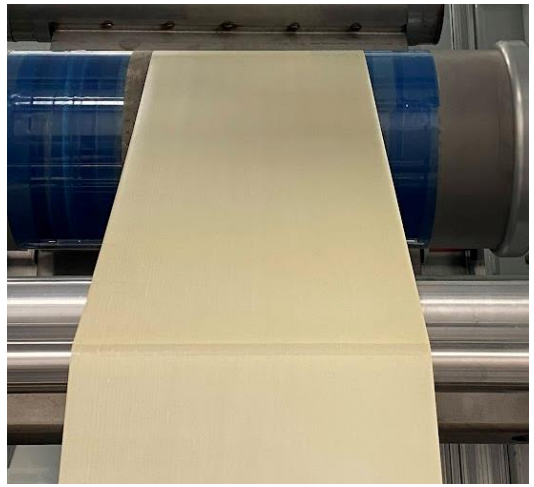
Membrane Dehumidification

Enabled by Evercloak Graphene Oxide Composite Membranes



Membrane dehumidification operation schematic

Evercloak Graphene Oxide (GO)



Evercloak GO Composite Membrane (roll-to-roll coating)

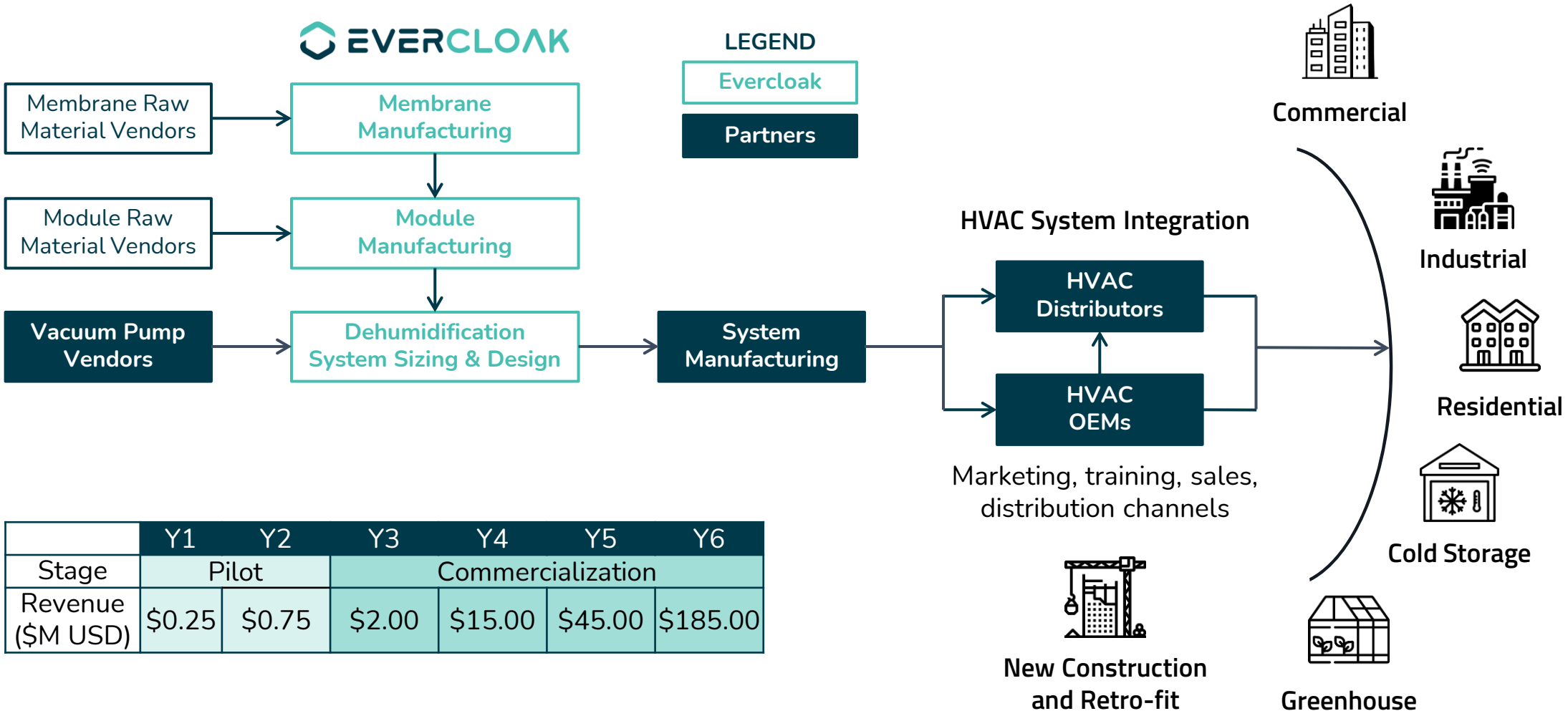
Membrane Dehumidification

Critical system components

1. **Membrane***
   High water vapour permeance; air blocking
2. **Water vapour driving force**
   Sweep gas, desiccants, vacuum
3. **Membrane cartridge & module***
   System integration
4. **System sizing software***

*** Evercloak holds key IP for each of these critical components**

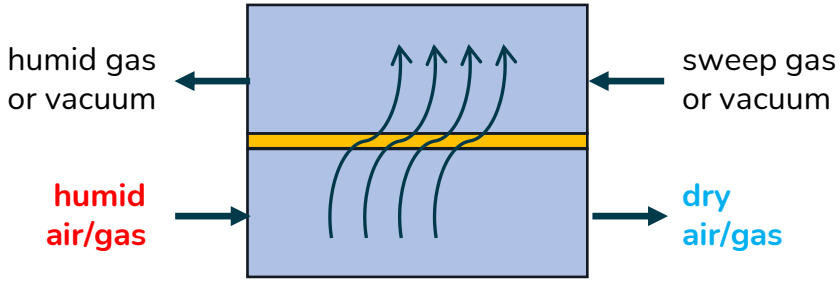
Manufacturing & Go-to-Market Plan



	Y1	Y2	Y3	Y4	Y5	Y6
Stage	Pilot		Commercialization			
Revenue ($M USD)	$0.25	$0.75	$2.00	$15.00	$45.00	$185.00

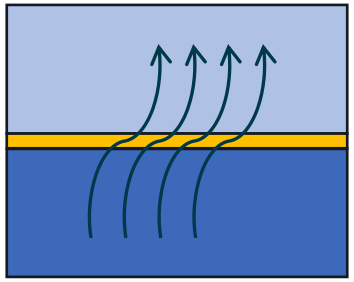
Membrane Application Opportunities

Vapor – Vapor Separations
(gas phase)



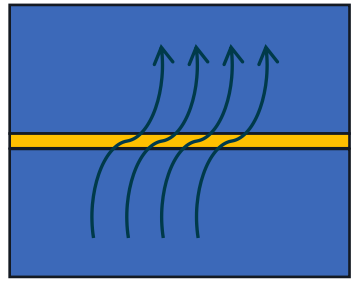
Energy recovery ventilators
Membrane dehumidification
Heavy water vapor capture
Gas dehydration (hydrogen, methane)

Vapor – Liquid Separations
(pervaporation)



Evaporative cooling
Fermentation broth concentrating
Food processing
Organic solution dehydration

Liquid – Liquid Separations
(liquid phase)



Water purification
Wastewater treatment
Hydrometallurgy

water vapor liquid water GO membrane water flow across membrane

EVERCLOAK

Leadership Team

Evelyn Allen
Chief Executive Officer & Co-founder

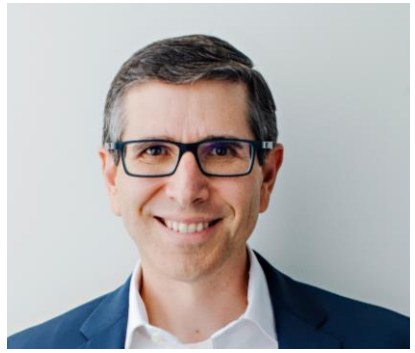
Pioneer in the cleantech space, leading engineering projects, growing multi-million dollar technology innovation platforms and building corporate strategic partners.

Michael Pope
Chief Scientific Officer & Co-founder

Expert in 2D nanomaterials, Faculty at University of Waterloo, Princeton Alumni, product development at Vorbeck Materials.

Ted Mao
Chief Technology Officer

Executive experience driving commercialization. Previously CTO & VP, Research and Development at Trojan Technologies, part of Danaher, S&P 100.



Matt Heuft
Vice-President of Business Development

Experienced leader passionate about the commercialization of technology. Delivers results by leveraging his strong business and technical background. Former Sr. Leader at Xerox Research Centre of Canada.

Helen Papachronis
Chief Operating Officer

Global Business Management Leader with a track-record of achieving topline growth in various B2B markets across companies such as: 3M Canada, General Electric, GN Johnston Equipment, and TELUS communications.

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xerox

TELUS

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Advisory Board

Steve Hoover, PhD
CEO, Impossible Objects

Former ED at Global Cybersecurity Institute at RIT, CTO & SVP at Xerox and former CEO of the Palo Alto Research Center (Parc) with roles in product development and research.

Ashish Kulkarni, PhD
Strategic Advisor

Former Chief Innovation Officer at GAF, Chief Technology & Innovation Officer at Celanese, VP of Global Engineering at Carrier, VP, Global Engineering American Standard and GE Plastics.

Trent Ogilvie, ICD.D
Strategic Advisor

Former President of ROCKWOOL North America, growing the business from 60 to over 1000 people and revenue up to $500M.

Wayne Maddever, PhD
Bio-industrial Innovation Canada

Extensive experience with leading early-stage sustainable technology companies. Fellow of the Canadian Academy of Engineering.

EVERCLOAK

Investment Roadmap (amounts in USD)

Proof of Concept Pre-SEED (2020-2022)	Pilots & Scale-up Seed (2023-2024)	Commercialization Series A (2025)
$6.3M	**$5.5M**	**$10M+**
$5.6M non-dilutive grants $700K in SAFEs	$1.5M Investment (Closed) $2.5M Grants (awarded) **ASK: $1.5M – Pilot**	

Join us!

Current Investment Opportunities

$1.5M - Pilot

Terms: Convertible debenture
20% discount
8% interest
$12.95M cap
Leverage: $2.5M grants

Fund advanced pilot, module manufacturing readiness, partnerships

Commercialization
Series A (2025)

$10M+

Your logo here...

...and/or here!

EVERCLOAK

Join us as we disrupt the

multi-billion dollar HVAC industry

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