

Global development of CCS technologies



CARBON value



Compact Carbon Capture solutions

Onshore

Offshore



CARBON value



Where are we based



Team Introduction: Leadership

A technology commercialization team centered on master's/PhD-level talent with UNIST core technology and global industry experience

CEO



Deoksoo Ko

Managing Director, Sunbo Angel Partners
Planning Office, Nexcon Technology
M.S. Management Eng., KAIST

Tech Advisor / Co-Founder



Prof. Hankwon Lim

Director, Carbon Neutrality Demo Center
Professor, Energy & Chemical Eng., UNIST
Ex-Praxair; Ph.D. Virginia Tech

CPO



Eunkyung Kim

Technical Sales, Hi-Air Korea
Principal Researcher, Samsung Heavy Industries
M.S. Mechanical Eng., Sungkyunkwan Univ.

CTO



Manhee Byun

Ph.D. Energy & Chemical Eng., UNIST
Chemical Eng. / Materials Science, UNIST

CSO



Boris Brigljevic

Energy & Chemical Eng., UNIST
Research Assistant Professor
Ph.D. Chemical Eng., Pukyong Nat'l Univ.
Heriot-Watt University, M.E

- **Prof. Hankwon Lim** Worked as Development Specialist at Praxair (now Linde), the world's largest industrial gas company, leading technology development
- **Deoksoo Ko, CEO** Responsible for business strategy and overall management
- **Core Team** Team built around master's/PhD-level talent with industry project experience — securing technology commercialization competitiveness

CarbonValue RPB Solution

Smaller, cheaper, and more efficient

vs. conventional: **1/10 the size**, CAPEX/OPEX **half the cost**

Conventional Tower Type



VS

CarbonValue RPB (Rotating Packed Bed)



Size **1/10** vs. conventional

CAPEX **50%↓** cost reduction

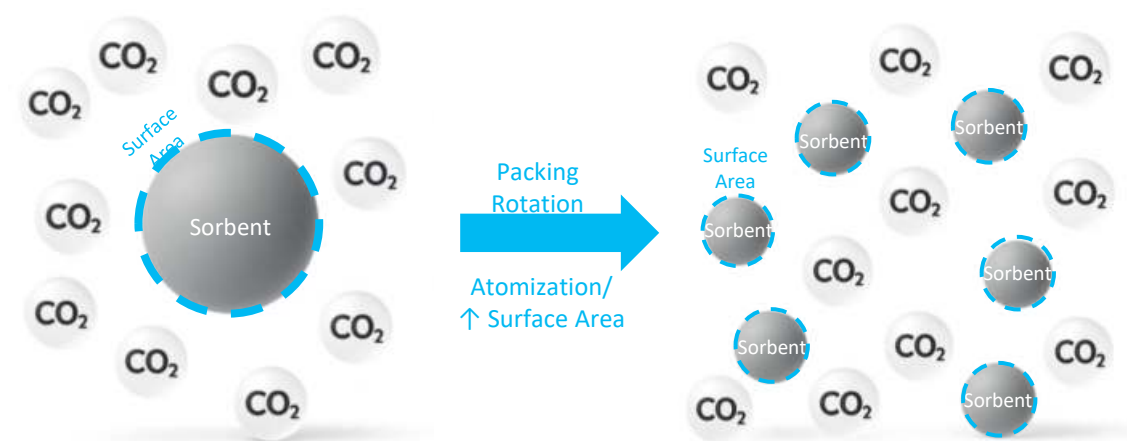
OPEX **50%↓** opex reduction

* RPB (Rotating Packed Bed): Uses centrifugal force to replace conventional gravity-based absorption towers — delivers the same performance at 1/10 the volume

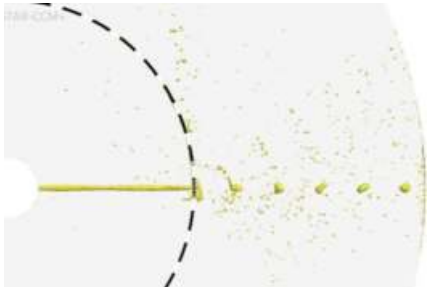
Technical Principle of the RPB Carbon Capture System

Centrifugal force from packing rotation atomizes the sorbent to capture carbon from flue gas

Wet-RPB Capture Principle: Centrifugal Force



e.
g.



*Packing rotation speed = 500RPM



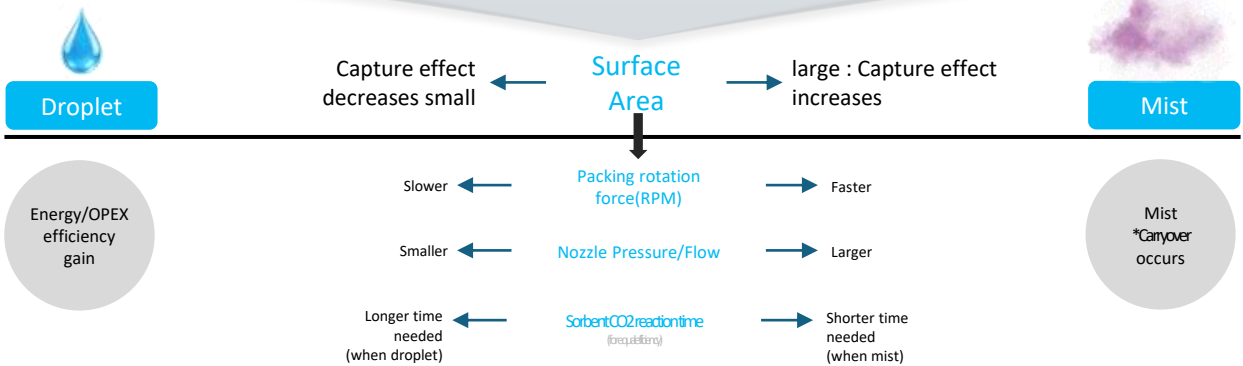
*Packing rotation speed = 1400 RPM

RPB Reactor Key Components



RPB Core Elements	
1	Packing
2	Nozzle
3	Sorbent

Optimizing core elements = capture performance



*Carryover: the phenomenon where sorbent, atomized by packing rotation, is entrained in the gas flow and stripped away unreacted as mist carryover (=solvent slip)

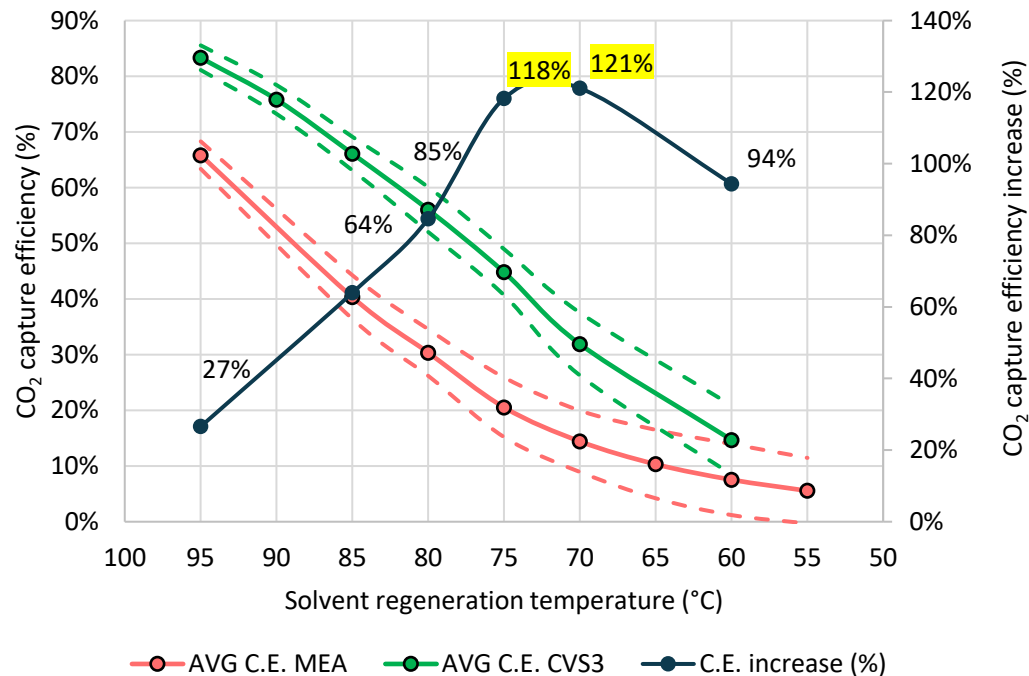
Solvent Technology Development Status

In-house developed sorbent CV-S3, commercial MEA vs. capture efficiency and energy efficiency verified

Performance Validation of CO₂ capture solvent 'CV-S3' vs. MEA benchmark

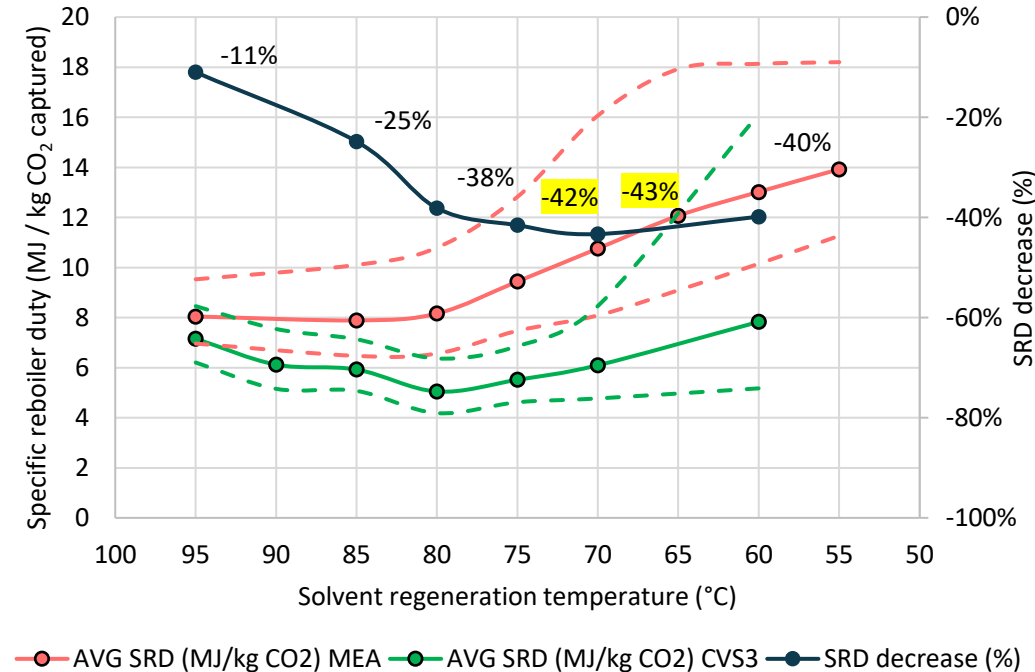
>2x increased capture efficiency

CO₂ capture efficiency (C.E.)
CVS3 vs. MEA standard (G/L = 75)



>40% decreased regeneration energy

Specific reboiler duty (SRD)
CVS3 vs. MEA standard (G/L = 75)



Project experience and deployment readiness

Demonstration, validation and first commercial traction reduce execution risk

Evidence from equipment, projects and independent validation



Commercial readiness

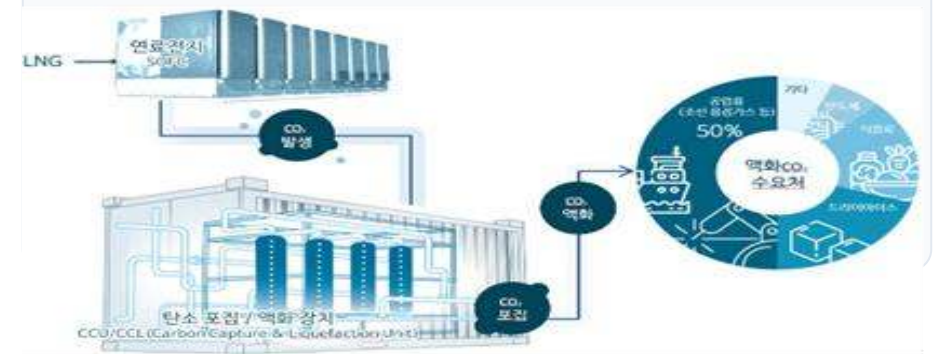
2,000 Nm³/h pilot system operated

2025–2026 | Carbon Value

SOFC demonstration completed · first commercial RPB equipment order secured

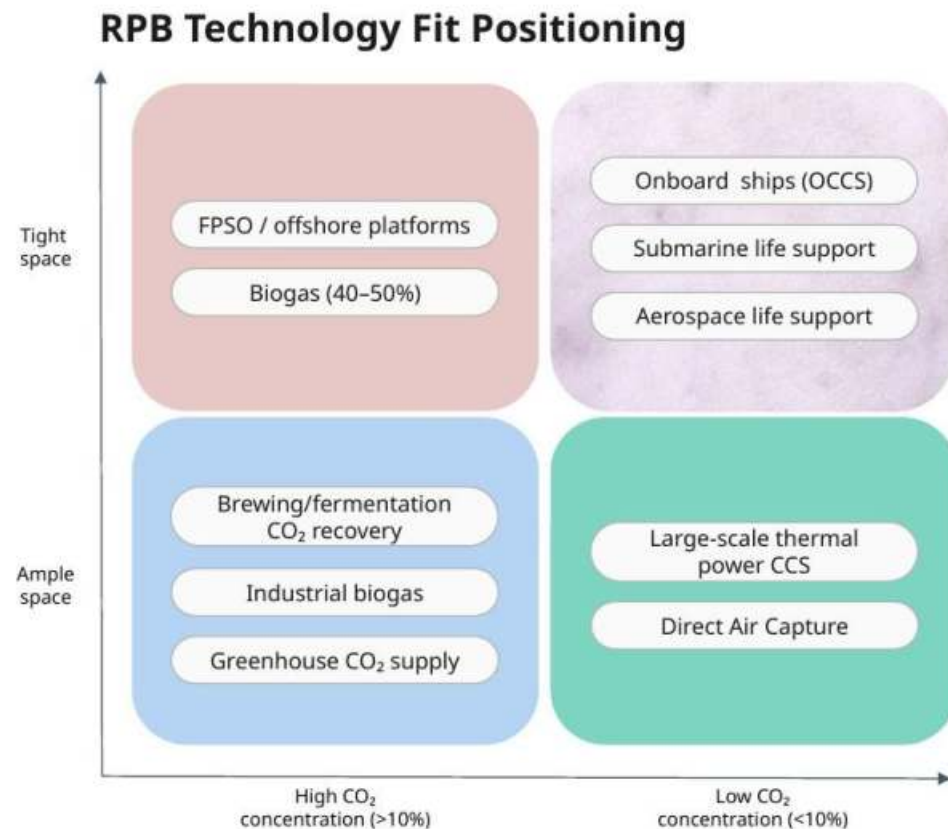
SK Ecoplant SOFC demonstration completed. Lloyd's Register AIP obtained for onshore and marine use. Proprietary CV-S3 solvent performance validated.

Proven platform for a UK feasibility study and pilot pathway



Priority Applications & RPB Technology Fit

Compact modular capture is strongest where footprint, retrofit constraints, modularity or distributed deployment matter.



Priority markets and applications

Biomass CHP

Biogenic CO₂ capture from distributed power and heat generation; negative-emission pathway when stored.

Biogas upgrading

High-concentration CO₂ separation during biomethane production; route to LCO₂ or utilization.

Power generation

Gas engines, turbines, CHP and distributed generation with compact retrofit constraints.

AI + gas turbine / SOFC

Behind-the-meter power combined with modular capture for fast-deployed low-carbon capacity.

OCCS

Onboard carbon capture where space and weight constraints favor process intensification.

WtE

Continuous flue-gas source with decarbonization value and possible CO₂ liquefaction or transport route.

Industrial emitters

Cement, lime, steel, glass, ceramics, chemicals, pulp & paper, boilers, furnaces and kilns.

Local application example

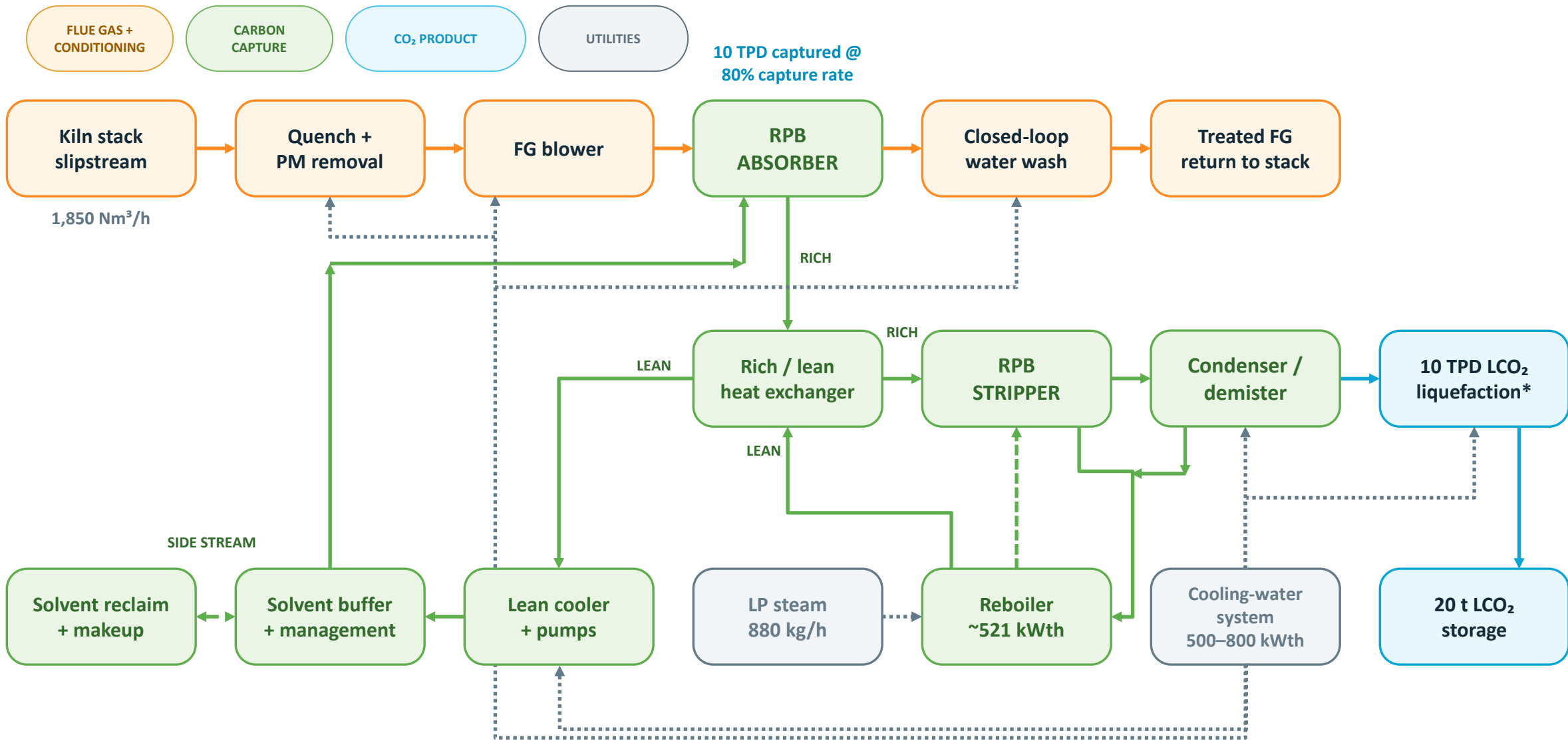
Commercial demo project proposal

nexe
GRUPA


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A modular slipstream plant closes the loop to liquid CO₂



Cooling supply: water wash, lean cooler, CO₂ KO and liquefaction

Five transportable modules fit a 220–500 m² plot



Indicative plot arrangement

EXTERNAL 20 t LCO₂ STORAGE TANK



220–350 m²

105–130 t

500–800 kWth

4 × 40-ft

practical process plot

operating weight range

spray-tower duty

container-equivalent modules

Planning estimate; final module count, civil foundations, access lanes and hazardous-area spacing require a site layout.

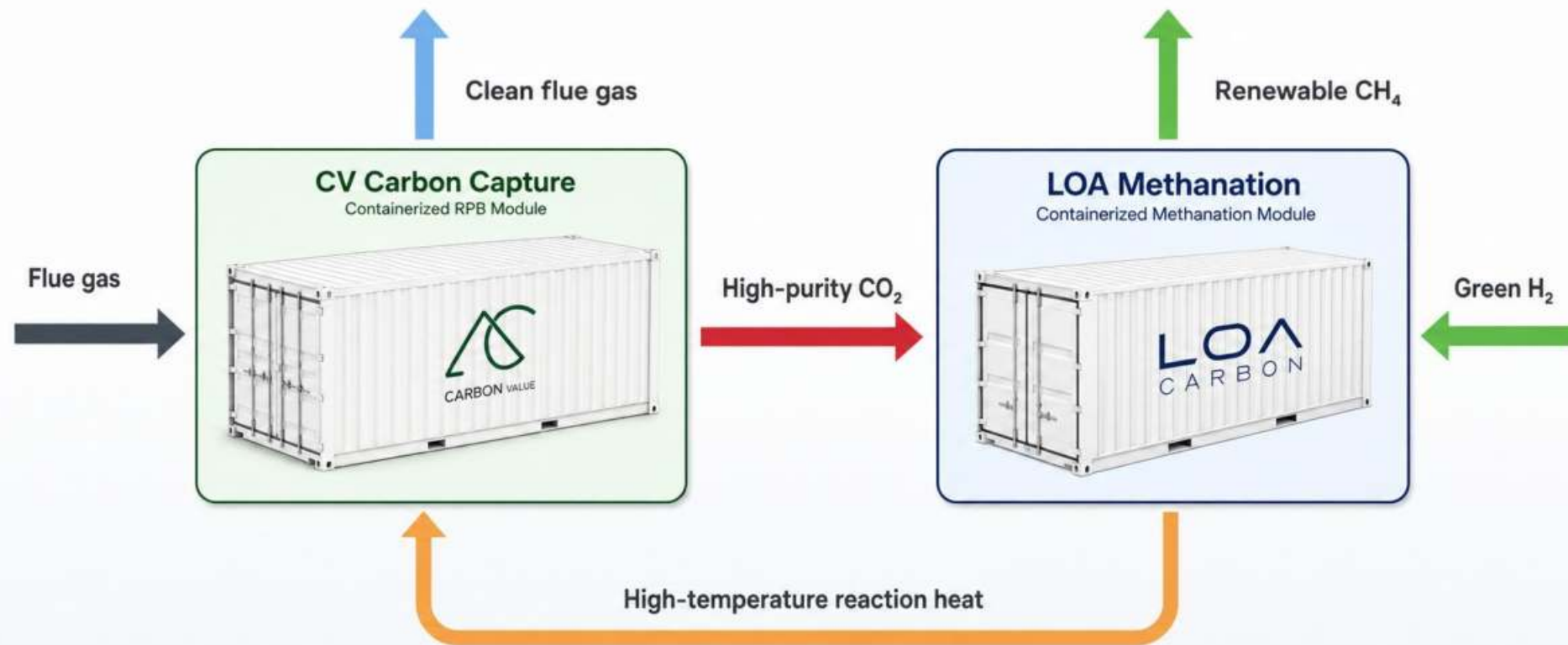
What to do with captured CO₂

INNOVATION

- Couples compact RPB carbon capture directly with modular methanation, converting captured CO_2 into renewable methane rather than treating it as a waste stream.
- High-temperature methanation heat supplies most of the solvent-regeneration duty; a heat pump closes only the remaining peak heat deficit.

INTEGRATION BENEFITS

- Increases renewable-methane yield from the same feedstock through integrated heat, water and optional oxygen loops.
- Containerized modules enable phased deployment across distributed industrial, agricultural and waste-management sites.





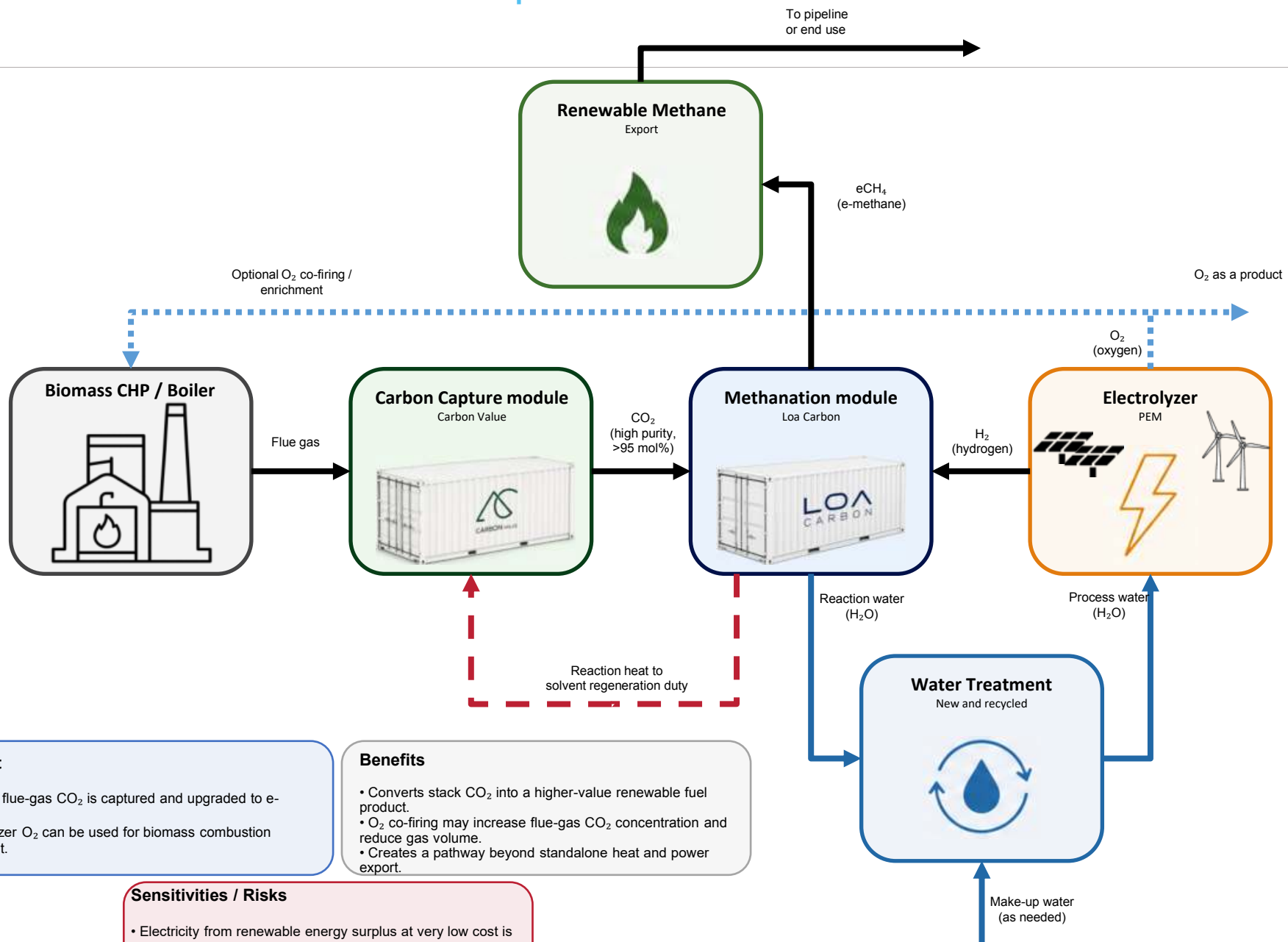
LINE LEGEND

Material / product

Water

High temp heat

Optional oxygen



Concept

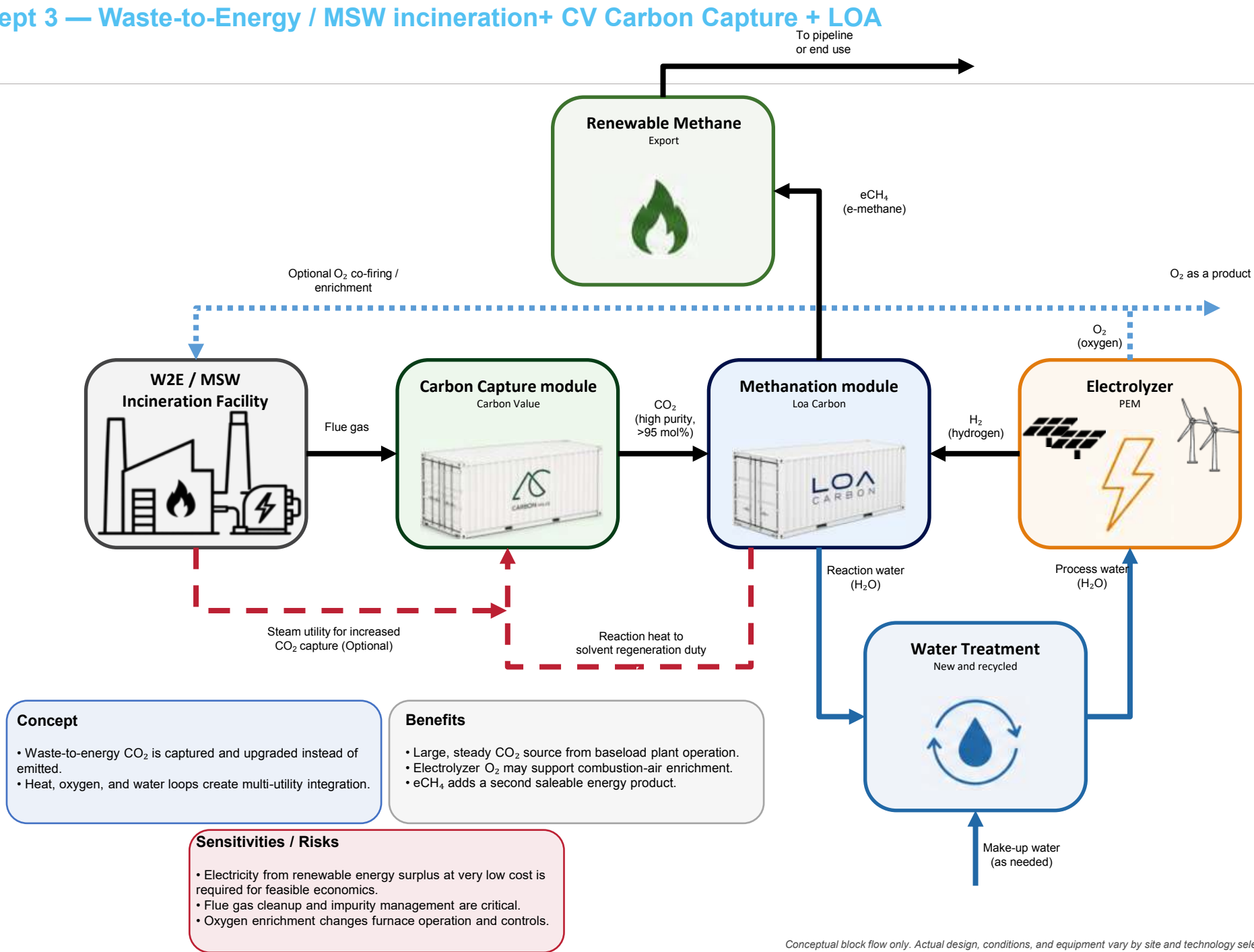
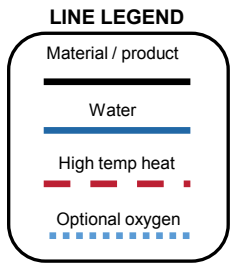
- Biogenic flue-gas CO₂ is captured and upgraded to e-methane.
- Electrolyzer O₂ can be used for biomass combustion enrichment.

Benefits

- Converts stack CO₂ into a higher-value renewable fuel product.
- O₂ co-firing may increase flue-gas CO₂ concentration and reduce gas volume.
- Creates a pathway beyond standalone heat and power export.

Sensitivities / Risks

- Electricity from renewable energy surplus at very low cost is required for feasible economics.
- Grid-export contracts may limit using CHP power internally.
- Combustion / boiler modifications may be needed for O₂ enrichment.





Compact Carbon Capture Solutions for On and Offshore