



(One of) our Gnarly Problems

Collaboration & Communication  
Industry ↔ Academia

CtS Convening  
May 2025

# Our lack of cohesion and real-world experience (at best) slows us down, or (at worst) threatens the whole industry

- ‘Hand-wringing’ over uncertainties, and casting that doubt externally.
  - Impacts policy makers, regulators, and buyers
  - Our MRV is a considered a weakness, but is it?

CDR method	Qualitative	Quantitative				
	Ability to measure and quantify CDR	Confidence in quantification	Share of academic literature	Protocol coverage	Protocol interconnectedness	Regulatory oversight
Ocean alkalinity enhancement						

State of CDR, 2024

- Lacking studies that are **relevant to real world conditions**
  - Studies focus on and/or communicate extreme conditions
  - Lack of field trials to test ‘real’ conditions

**Global carbonate chemistry gradients reveal a negative feedback on ocean alkalinity enhancement**



# Action #1: Academic/Industry funding that actually WORKS

Traditional funding:

- Takes too long - Time between 'idea' and any 'action' is at least 1 year
- Too much effort (certainty for industry) - Writing, contracting, reporting
- PIs can only direct ~20% of time, bulk of work done by students
- Often can't directly fund the startup (often startups to PAY IN!!)

Open question: how to solve the academic red-tape?

## Solutions?

**More/new 'applied science' funding (i.e. C2S-style!)**

- Rapid turnaround, low reporting burden, FLEXIBILITY
  - Just get moving and do the work



## Action #2: Focus studies on real-world conditions

- Model conceivable scenarios
  - Lehmann and Bach 2025. Global carbonate chemistry gradients reveal a negative feedback on ocean alkalinity enhancement.
    - The “**negative feedback**” occurs at an unrealistic scenario)
- Test organisms w/ real-world concentrations,
  - Highest alkalinity perturbation at 10kt scale ~ 100-200  $\mu\text{mol/kg}$
- Secondary precipitation tests in diluting environments
- Ensuring studies are clear about what scale they are testing
  - is this relevant to early pilots? Or max-scale OAE deployment?
- Find additional avenues for relaying results. For example:
  - Engage with C2S or industry to help craft ‘accessible’ content
  - Particularly if results are less ‘publishable’ (b/c they are ‘boring’)
    - **BORING IS GOOD!**

## Action #3: Decoupling “Perfect” and “Good-enough”

- Academia must have rigour, but can we establish perfection AND “good enough for right now”?
  - For quantification, AND for bio-impacts
- If so, how do we communicate this to the broader world!  
**(suggestion: not via peer-reviewed papers!)**

## Other problems/solutions:

**“I don’t have time to publish, I just want to DO THE WORK”**

**Solution? - incentivize (fund?) non-traditional dissemination**

**“I have lots of data, and am happy to share my data, but who is actually going to look at it”**

**Solution? - Small funded projects focused on analyzing existing data**

**Social license remains a big concern, but we’re poor communicators (esp. universities)**

**Solution? - Compare/Contrast OAE-MRV to other pathways.**

**“Oh, so your MRV is ‘model-based’”**

**Solution? - Compare/Contrast OAE-MRV to other pathways.**

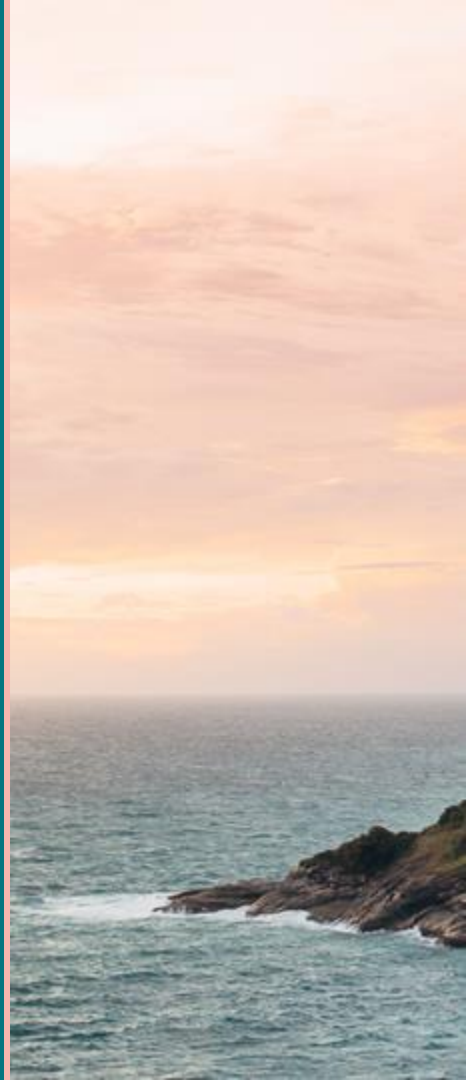


# So what now?

Let's find creative avenues to fund academic-industry partnerships, to facilitate more field trials

Let's ensure our studies test realistic field conditions, and share those results (even if they are boring)

Let's align on where we stand regarding quantification uncertainties and ecological safety, and **communicate this broadly and effectively.**





Thank You!