

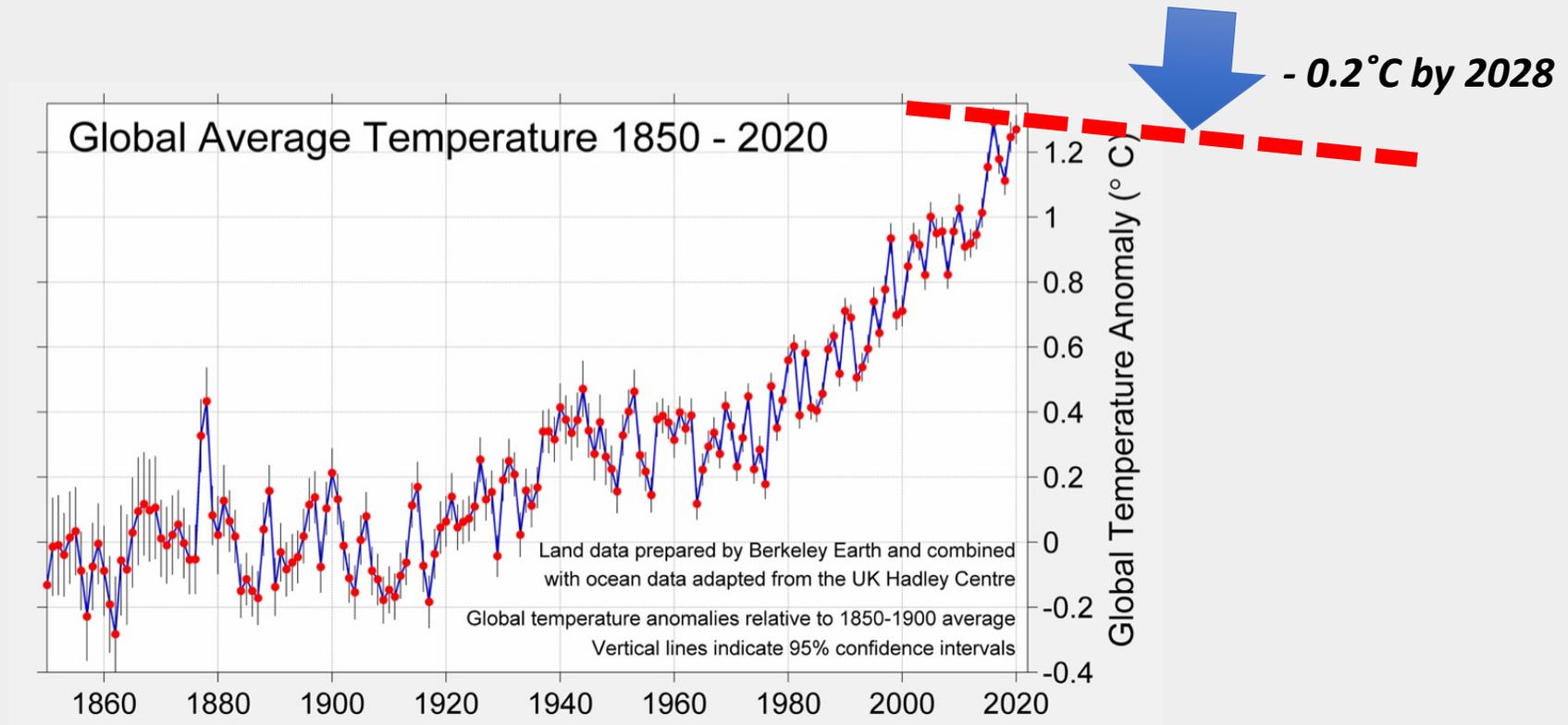


The Methane Moment

Cooling the planet by actively neutralizing methane

IMAGINE...

... that we could hold global surface temperatures to their current levels – or even reduce them.

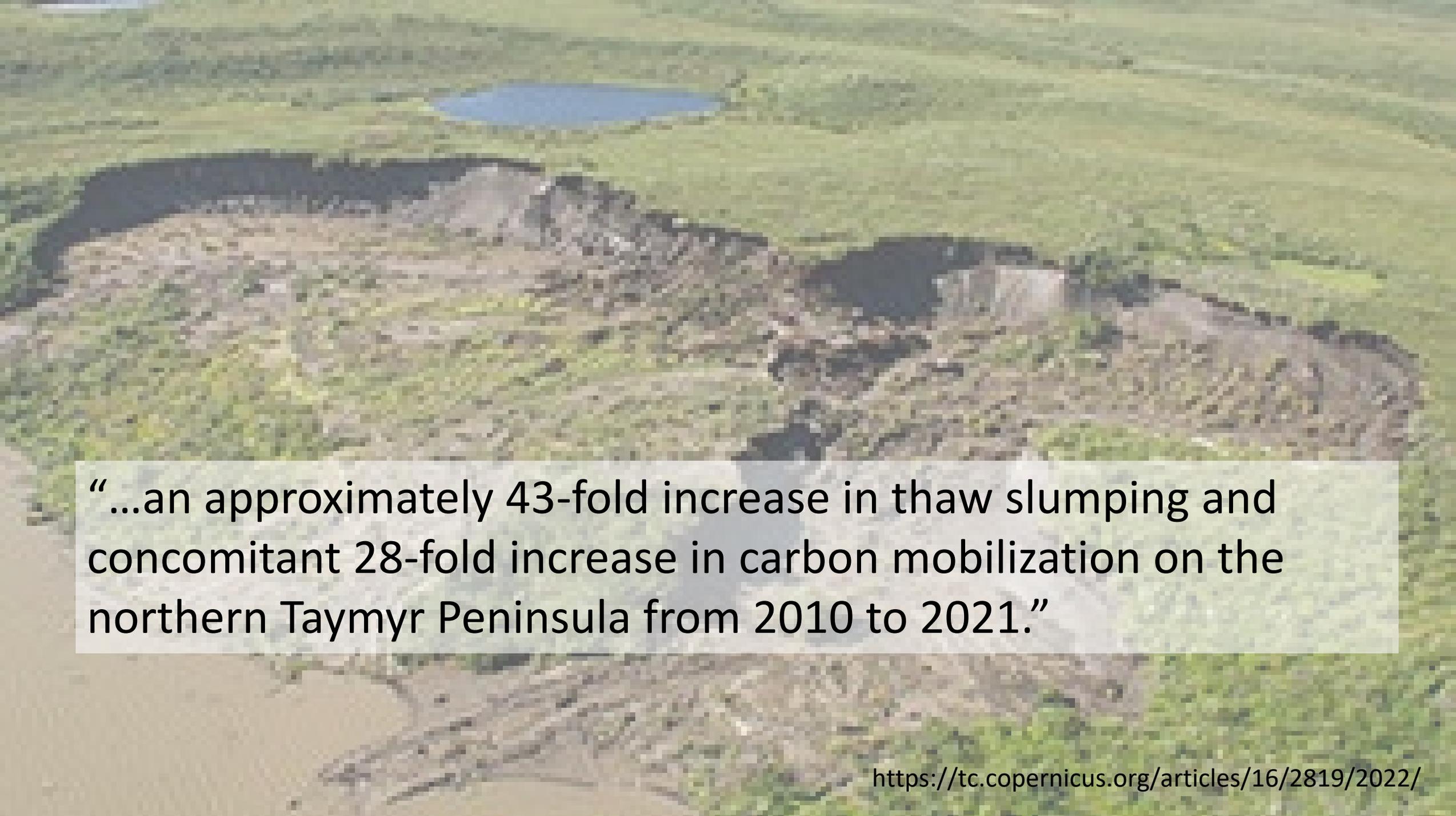


“Humanity is on a highway to climate hell. We are in the fight of our lives and we are losing...”

Our planet is fast approaching tipping points that will make climate chaos irreversible.”



UN Secretary General António Guterres, at the opening of COP 27, Nov. 7, 2022

An aerial photograph of a tundra landscape. In the upper center, there is a small, irregularly shaped pond with blue water. The surrounding ground is a mix of green and brown, indicating vegetation and exposed soil. In the foreground and middle ground, there are several large, dark, irregularly shaped areas that appear to be slumped or eroded, contrasting with the smoother, greener tundra. The overall scene suggests a significant change in the landscape, likely due to thawing permafrost.

“...an approximately 43-fold increase in thaw slumping and concomitant 28-fold increase in carbon mobilization on the northern Taymyr Peninsula from 2010 to 2021.”

A dramatic sky with a bright sun or moon and a lightning bolt striking down.

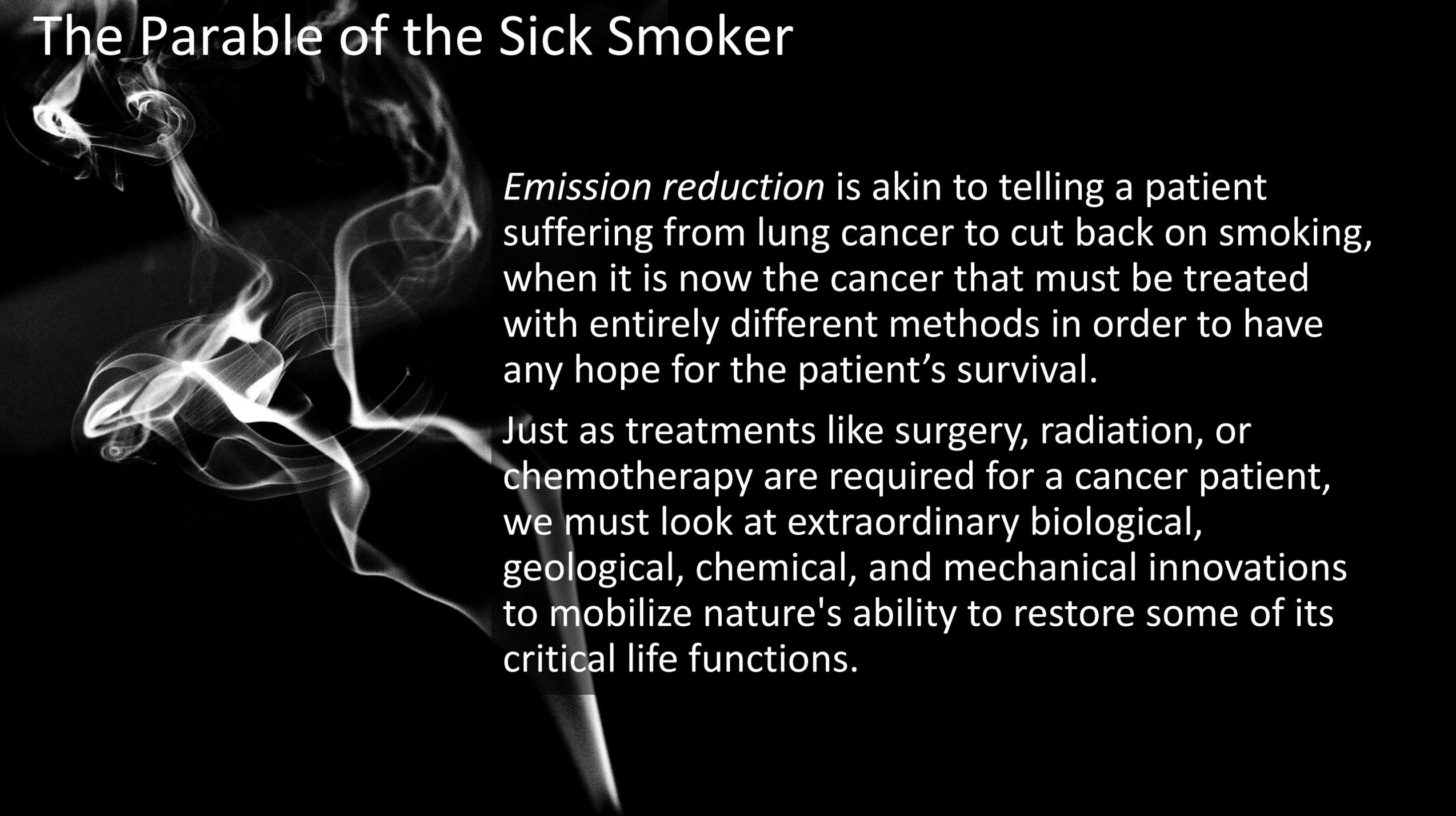
“At just 1.2°C of global average warming, tipping points (meaning the point of no return) have been passed for several large Earth systems. These include Arctic sea ice, the Greenland Ice Sheet, the Amundsen Sea glaciers in West Antarctica, the eastern Amazonian rainforest, and the world’s coral systems...”

(Source: Climate Dominoes, National Centre for Climate Restoration, Melbourne, May 2022 by David Spratt, Climate Code Red, September 28, 2022).



Emission reduction targets in a hydrocarbon-driven world will continue to remain out of reach. The current gap between emissions goals (-45% of CO₂ by 2030) and the actual trajectory we're on (+10.6% by 2030, according to the most recent UN projections).* We will be 118% off target by 2030.

The Parable of the Sick Smoker



Emission reduction is akin to telling a patient suffering from lung cancer to cut back on smoking, when it is now the cancer that must be treated with entirely different methods in order to have any hope for the patient's survival.

Just as treatments like surgery, radiation, or chemotherapy are required for a cancer patient, we must look at extraordinary biological, geological, chemical, and mechanical innovations to mobilize nature's ability to restore some of its critical life functions.

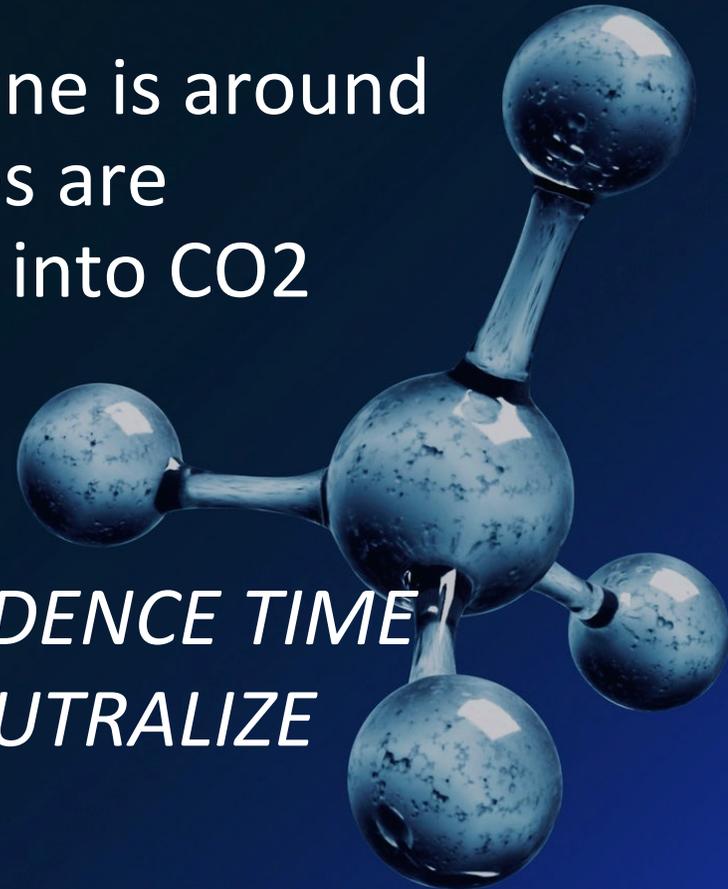
METHANE

- Methane is responsible for approx. 1/3 of current global heating, and is initially 120x more potent as a greenhouse gas than CO₂ / 80x over a 20-year timeframe.
- As the Arctic warms there is an increasing threat of methane bursts from below long frozen ground, bursts that could alter the climate nearly instantaneously.
- **Current estimates of the economic impacts from methane bursts place this in the \$8-60 trillion dollar range.**
- There is currently no solution framework to detect methane bursts in real time and reduce methane at its source

THE METHANE OPPORTUNITY

The normal atmospheric residence time of methane is around nine years, by which time most of these molecules are removed from the atmosphere by oxidizing them into CO₂ and H₂O.

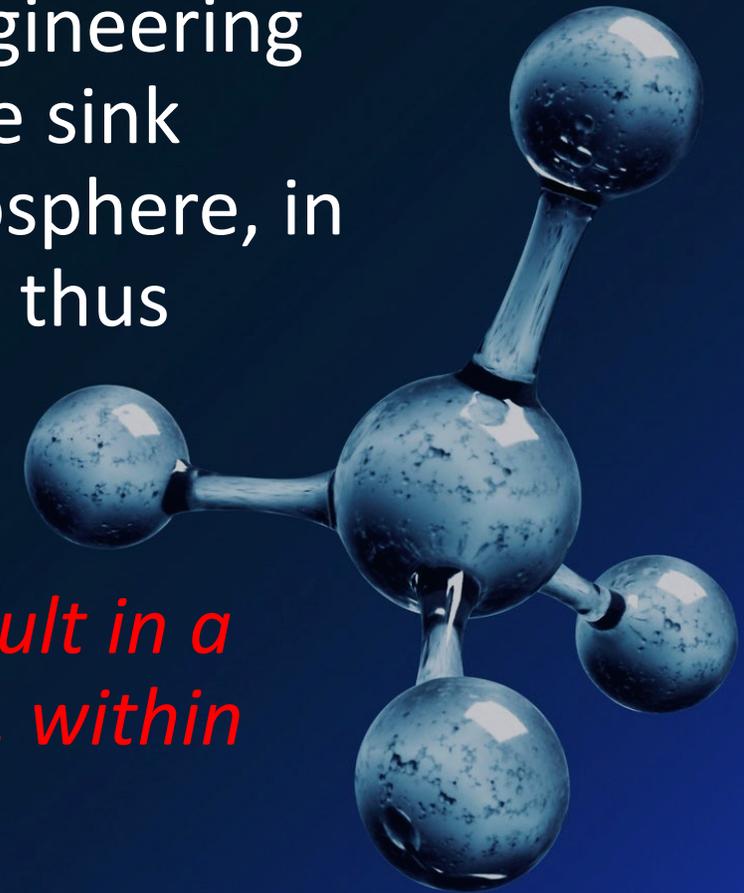
WHAT IF WE COULD REDUCE THE METHANE RESIDENCE TIME IN THE ATMOSPHERE BY A FACTOR OF 2, AND NEUTRALIZE AIRBORNE METHANE AT OR NEAR ITS SOURCES?



THE METHANE SOLUTION

We have developed a safe, science-and-engineering based approach for mimicking the methane sink chemistry that naturally occurs in the atmosphere, in the process actively oxidizing methane and thus neutralizing its ability to warm the planet.

The deployment of our solutions should result in a cooling effect of approx. 0.2°C. by 2028 i.e., within five years



SOLUTION FRAMEWORK



1. A methane burst occurs

2. Satellites detect it

3. They send the data to a Methane and Arctic Cooling Operations Center/MACOC

4. Software/AI within the MACOC analyzes it

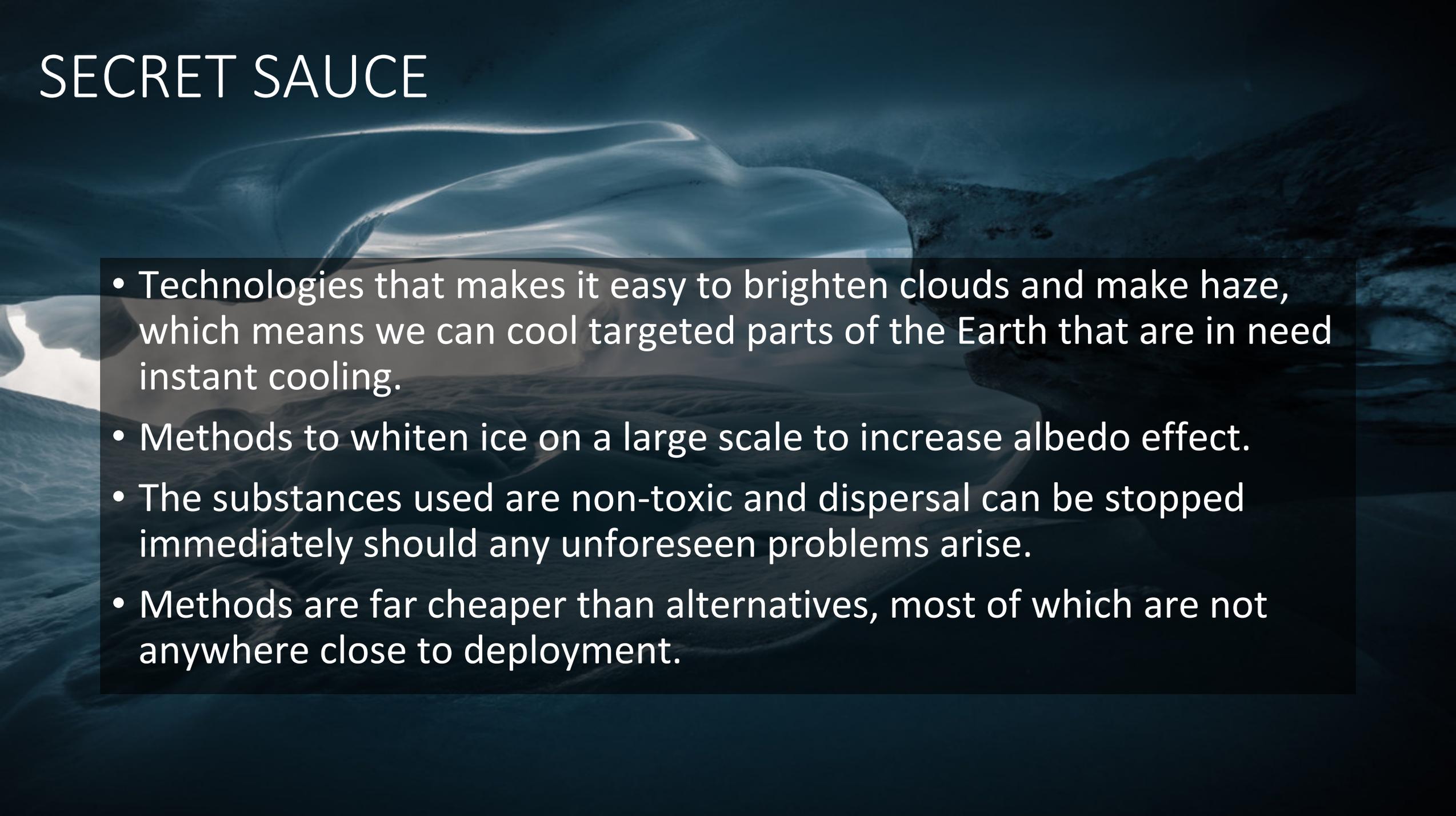
5. The MACOC sends out jets/drones to disperse TOA-EDARA

6. Methane burst is neutralized

SECRET SAUCE

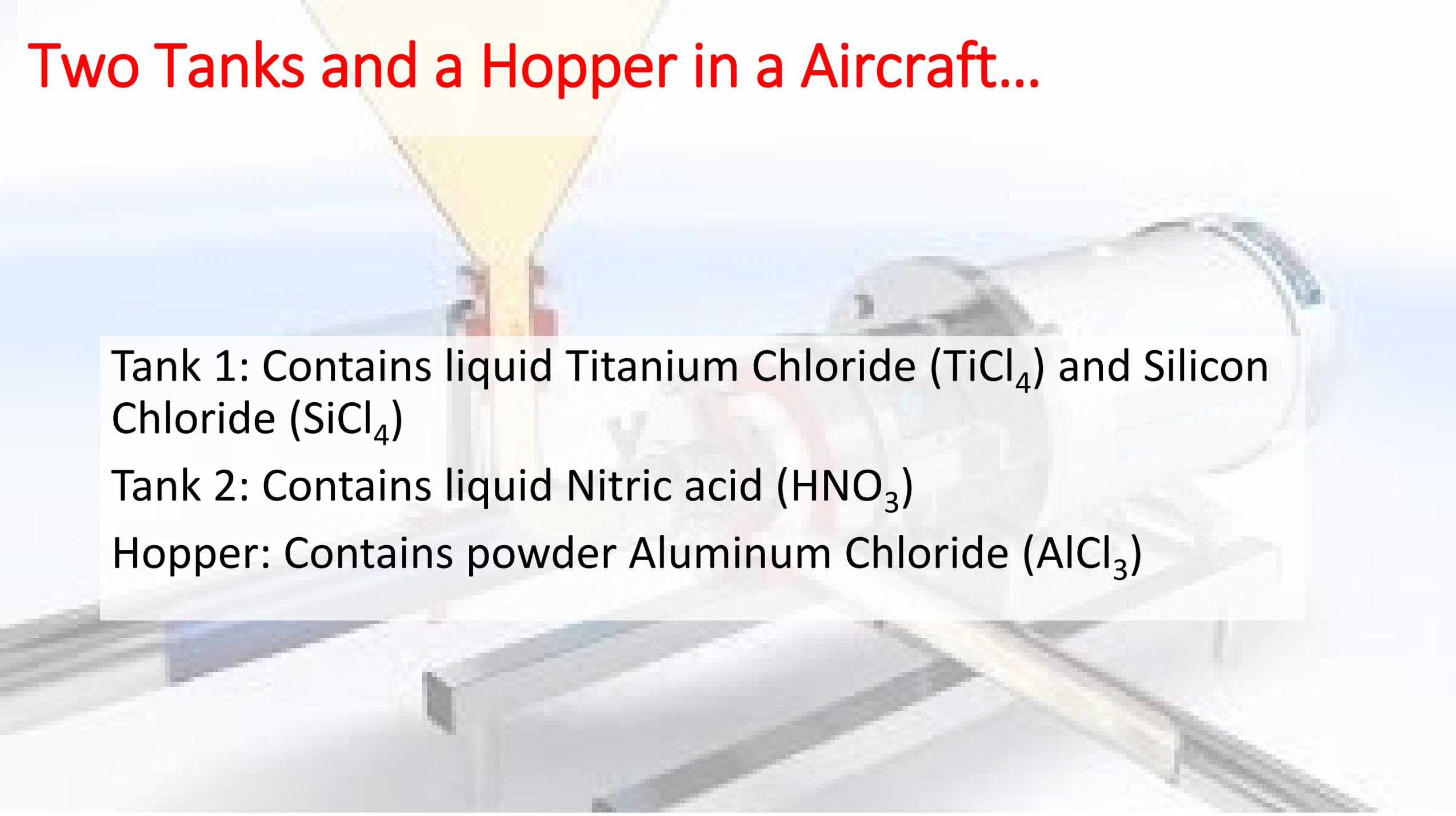
- Deep knowledge of Earth's natural methane sink chemistry. That sink can be safely mimicked to accelerate oxidation of methane in the atmosphere.
- This simulated sink also removes pollution and other powerful greenhouse gases and soot from the air.
- It also can positively augment the immense cooling power of clouds

SECRET SAUCE



- Technologies that makes it easy to brighten clouds and make haze, which means we can cool targeted parts of the Earth that are in need instant cooling.
- Methods to whiten ice on a large scale to increase albedo effect.
- The substances used are non-toxic and dispersal can be stopped immediately should any unforeseen problems arise.
- Methods are far cheaper than alternatives, most of which are not anywhere close to deployment.

Two Tanks and a Hopper in a Aircraft...

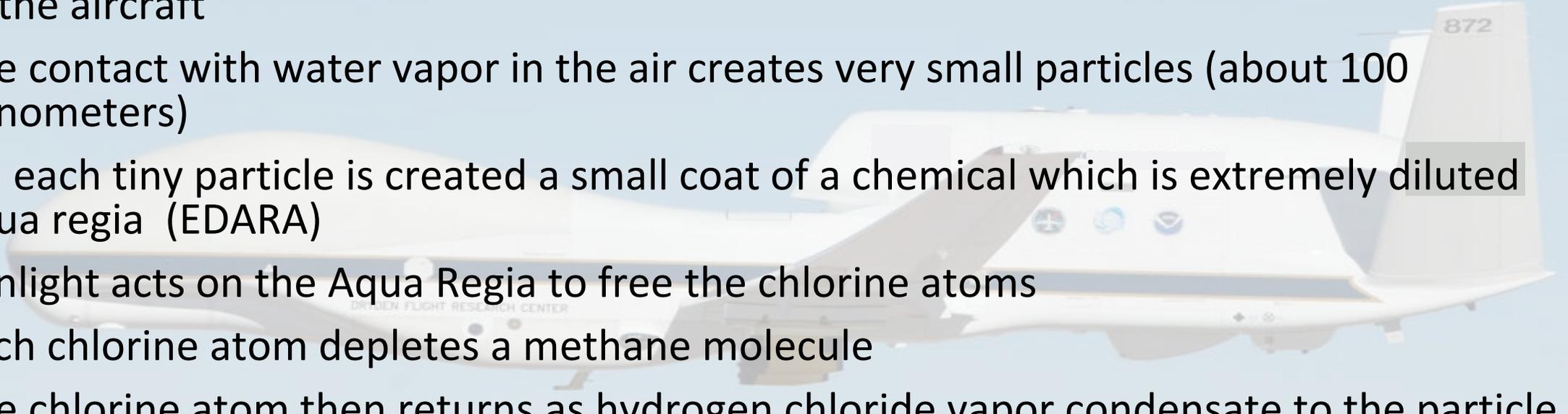


Tank 1: Contains liquid Titanium Chloride (TiCl_4) and Silicon Chloride (SiCl_4)

Tank 2: Contains liquid Nitric acid (HNO_3)

Hopper: Contains powder Aluminum Chloride (AlCl_3)

Dimensions of Deployed Solutions

- Leverages liquid Titanium Chloride, Silicon Chloride, Nitric Acid and powder Aluminum Chloride
 - The liquids and the powder are released after evaporation, mixing with the outside air of the aircraft
 - The contact with water vapor in the air creates very small particles (about 100 nanometers)
 - On each tiny particle is created a small coat of a chemical which is extremely diluted aqua regia (EDARA)
 - Sunlight acts on the Aqua Regia to free the chlorine atoms
 - Each chlorine atom depletes a methane molecule
 - The chlorine atom then returns as hydrogen chloride vapor condensate to the particle
 - It can then be used again
 - **Bottom line – 1 chlorine atom hypothetically can oxidize/remove 1000 methane molecules**
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OUR PLAN

- Detecting and reducing arctic methane bursts in real time
- Take what we have learned and apply it globally to halve methane levels around the planet

AND

- Leverage non-toxic technologies to create clouds over critical ice as well as whiten the ice
- Take what we have learned and apply it to protecting mountain glaciers which are critical sources of human water supply

BENEFITS

Remove powerful greenhouse gases by increasing Earth's natural sink

- By mimicking natural processes
- In a way that can be stopped immediately
- Operating close to big sources of methane, like Arctic methane bursts
- On a large scale
 - Halve atmospheric methane in 5 years

BENEFITS

Reduce extreme weather events, by:

- Reversing Arctic warming
- Slowing Arctic glacier melt by
 - Shielding them from the sun
 - Increasing Arctic cloud reflectivity
 - Whitening the ice with a non-toxic white powder

BENEFITS

A scenic view of a mountain glacier flowing into a turquoise lake, with snow-capped peaks in the background. The glacier is a mix of white and blue, and the lake is a vibrant turquoise color. The foreground is a rocky shore with some small plants. The sky is blue with some white clouds.

**Protect vital water supplies around the world
by protecting mountain glaciers from melting**

8 CRITICAL INSIGHTS AND BREAKTHROUGHS

1. Iron Salt Aerosol to mimic naturally occurring methane depletion

2. Use of nitrate to speed up photo catalysis

8. Use of a white powder slurry to whiten ice that has not yet started to melt in the sun

7. How to make nano-sized particles suitable for MCB

3. Use of titanium instead of iron opened up methane depletion near ice fields

6. Marine cloud brightening (MCB) to cool the oceans

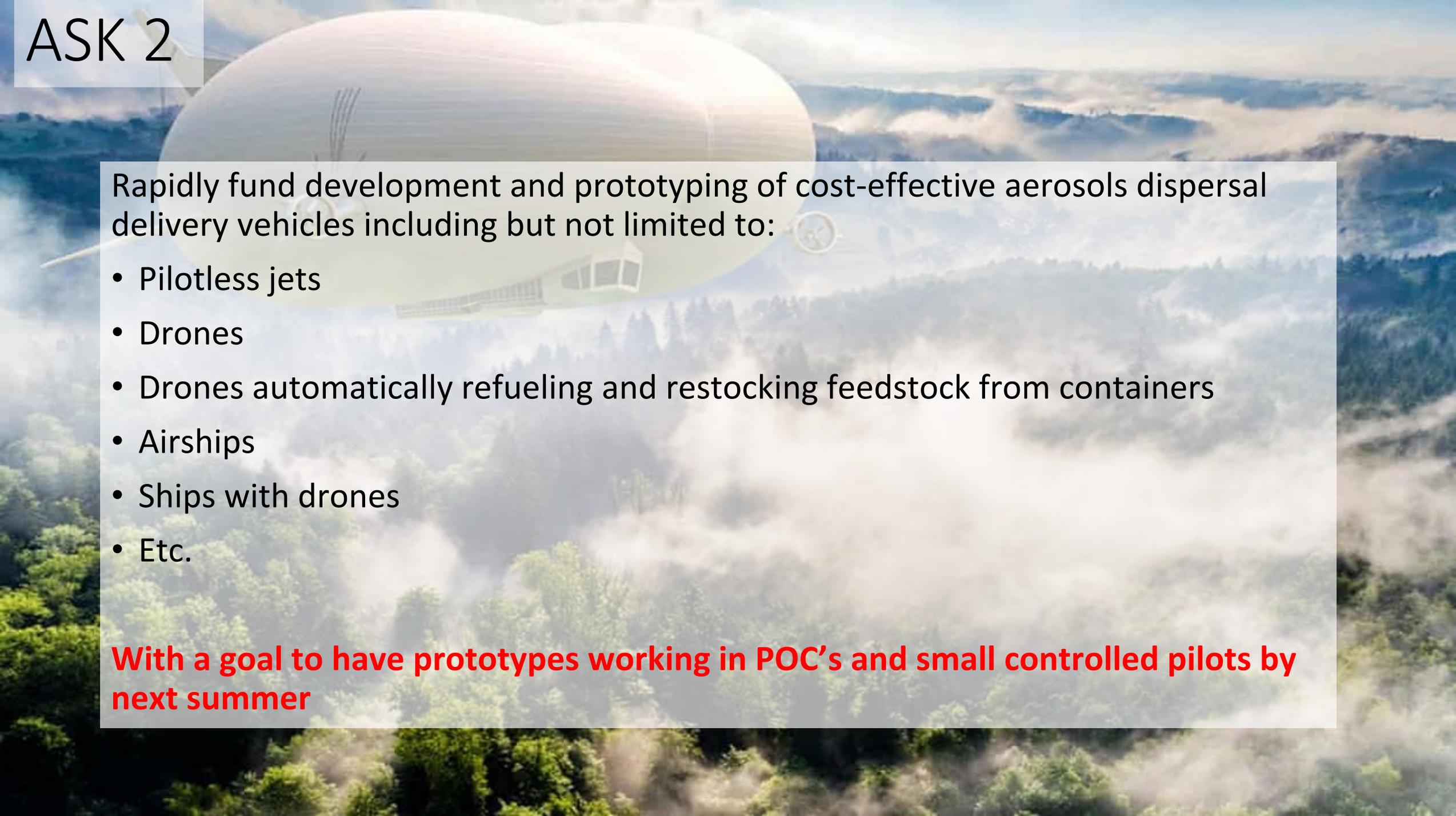
4. Use of nitrate on TOA particles

5. Use of jets makes TOA-EDARA much more effective at methane depletion

ASK 1

- Rapidly fund R&D, POC's and small controlled pilots to verify:
- Deploy methane reduction aerosol, cloud whitening aerosol and ice whitening agent to ensure they work as intended
- Confirmation of low toxicity, and identification and remediation of potential other unintended impacts.
- Test of the integrated rapid response system, e.g. the satellite real-time monitoring system which is linked to ground based operational decision centers and software/AI support technologies that act as guidance and monitoring systems for jets, drones, etc. and manage the dispersal of appropriate aerosols.
- Establish the initial governance framework allowing cross-jurisdictional management of the above.
- **With a goal to have pilots in the arctic by next summer**

ASK 2



Rapidly fund development and prototyping of cost-effective aerosols dispersal delivery vehicles including but not limited to:

- Pilotless jets
- Drones
- Drones automatically refueling and restocking feedstock from containers
- Airships
- Ships with drones
- Etc.

With a goal to have prototypes working in POC's and small controlled pilots by next summer

ASK 3

- Rapidly fund the creation of a Human Arctic Cooling Industry Program
- Create the initial governance framework for this which effectively involves arctic citizens
- Create pilot programs for creating industries related to the proposed arctic methane response and cooling systems
- Create pilot programs for molten salt reactors and indoor food production programs in the arctic
- **Goal – Have the initial governance in place by next summer**

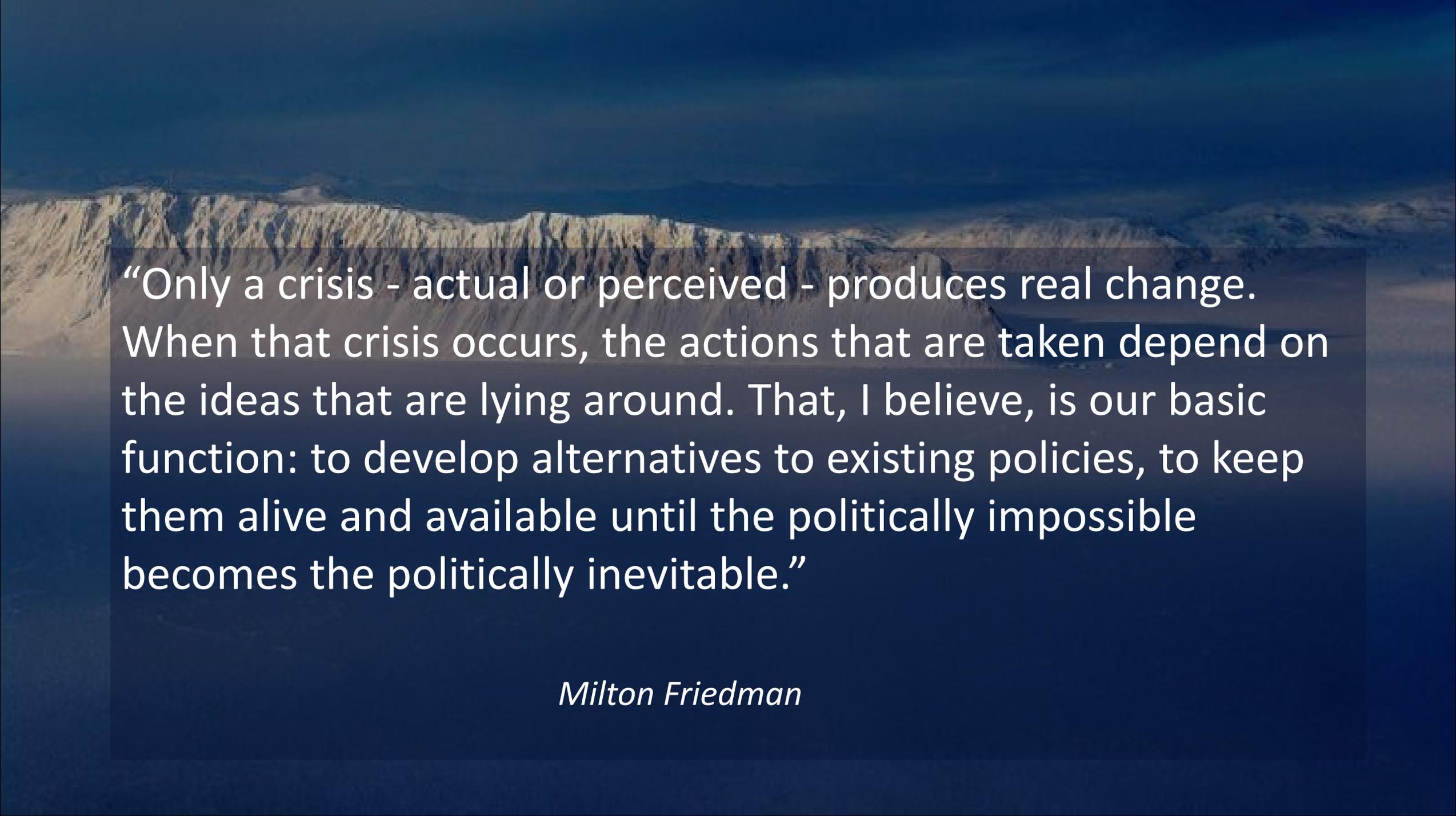
IN SHORT

We are looking for funding and (political) commitment to develop:

- The initial governance framework
- Satellite contracts to obtain the arctic methane data in real time
- Creating an AI based model which relevant government agencies and partners support
- Prototyping cost for dispersal vehicles
- R&D for proving out TOA/EDARA and dispersal technology
- POC's to prove out all the above
- Toxicology R&D/POC's to occur in parallel

While Time is of the Essence, So is Prudence

- This proposal recognizes the need to do significant testing and monitoring before rolling these promising solutions out on a large scale.
- This requires a great number of pilots and POCs (Proof of Concepts) before final roll out can be done.
- We see the first year as a time for research and development without major public announcements about the intended wider roll out, to avoid delays from the inevitable (political) challenges that are typical for such efforts. Time is much too short now.

A wide, deep canyon with layered rock formations under a clear blue sky. The canyon walls are composed of light-colored, stratified rock, and the floor is a mix of sand and small rocks. The sky is a deep, clear blue, and the overall scene is a vast, natural landscape.

“Only a crisis - actual or perceived - produces real change. When that crisis occurs, the actions that are taken depend on the ideas that are lying around. That, I believe, is our basic function: to develop alternatives to existing policies, to keep them alive and available until the politically impossible becomes the politically inevitable.”

Milton Friedman

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Methane Moment Pitch Package

This deck is part of a Methane Moment package:

- [Website](#)
- [Methane Moment Pitch deck](#)
- **High Level Summary Decks:**
 - [Chemistry, Toxicology, Environmental Effects & Dispersal](#)
 - [Governance](#)
 - [Operational Data & Security](#)
 - [Cost Overview](#)
 - [Methane Moment & Politics](#)
 - [Program/Project Plan](#)
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