
VERDOX
Electric carbon removal for a Net-Zero future.

# Electric carbon removal for a Net-Zero future.

- Patented, **electrically-driven** $CO_2$ capture system
- **70%+ less energy & cost** than competitors

VERDOX

# Verdox's Efficiency Advantage Across Applications

## Verdox is developing solutions for both DAC and point source applications…

**Direct Air Capture**

~400ppm

+

**Point Source Capture**

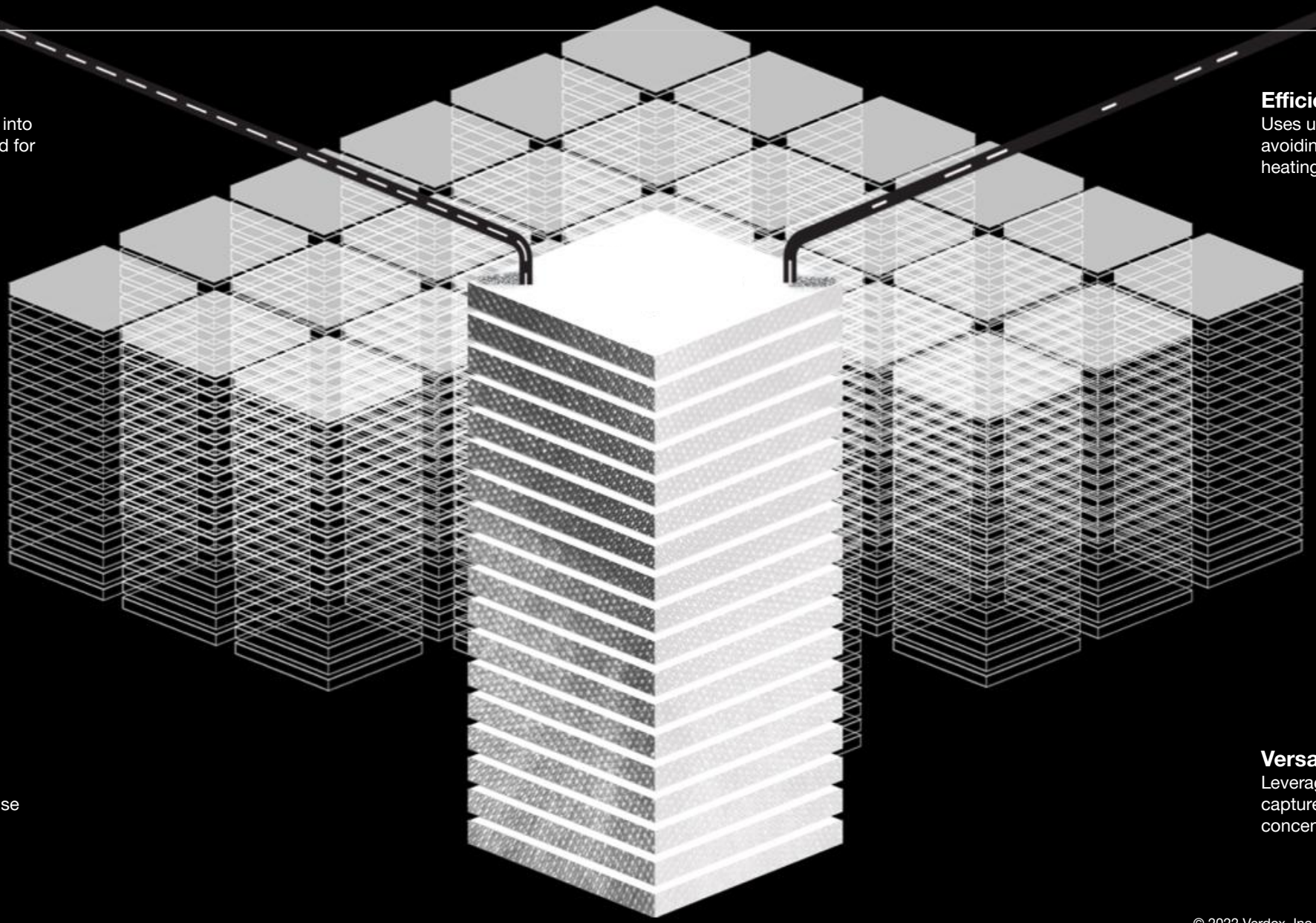
< 1% - 5%

## …due to the technology's high efficiency independent of $CO_2$ concentration

# The Verdox System

**Electric**
Requires only electricity as input into the capture mechanism - no need for heat or water.

**Efficient**
Uses up to 70% less energy by avoiding energy losses from heating & cooling.



**Reliable**
Requires no moving parts in the capture mechanism that can cause downtime.

**Versatile**
Leverages modular approach to capture $CO_2$ at any scale and concentration.

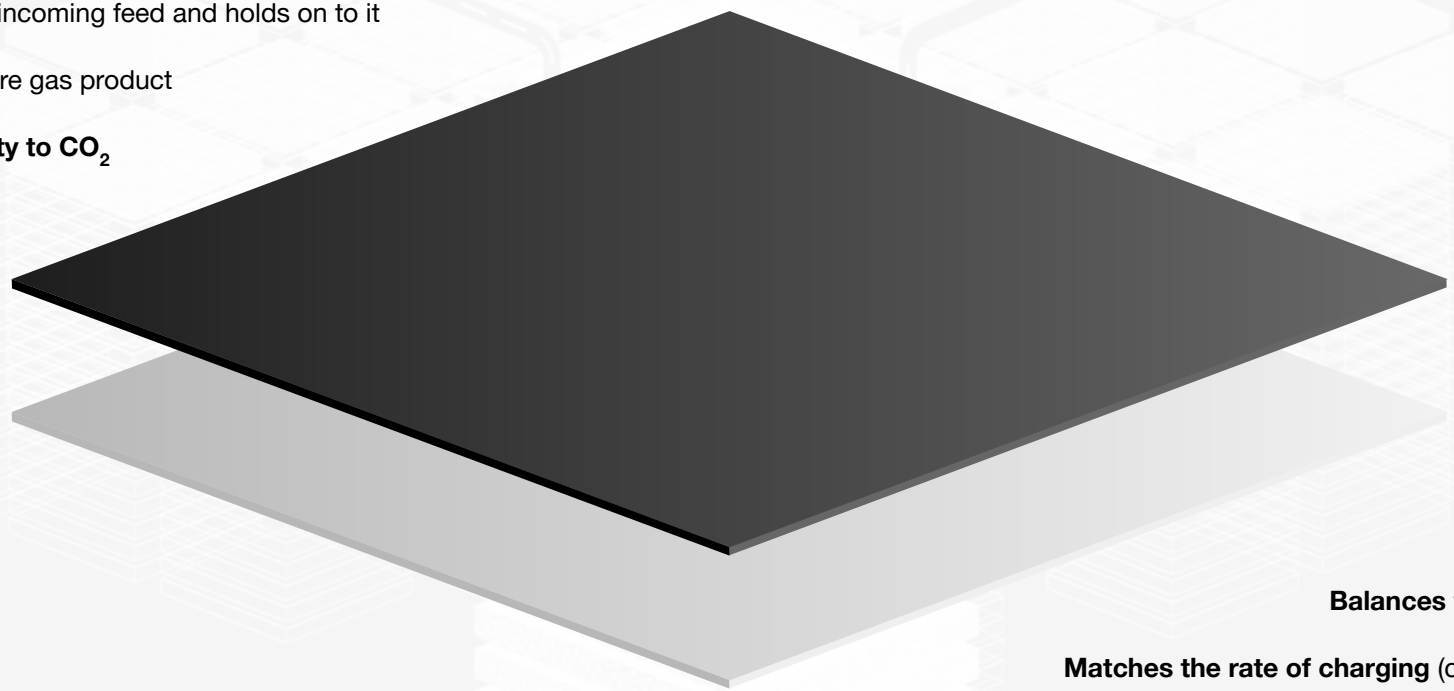
# The Electrochemical Cell

## Capturing electrode

**Captures $CO_2$** during charging from incoming feed and holds on to it

**Release $CO_2$** during discharge as pure gas product

Has redox material with **binary affinity to $CO_2$**



Does **not interact** with **$CO_2$**

**Balances** the **charge** of capturing electrode

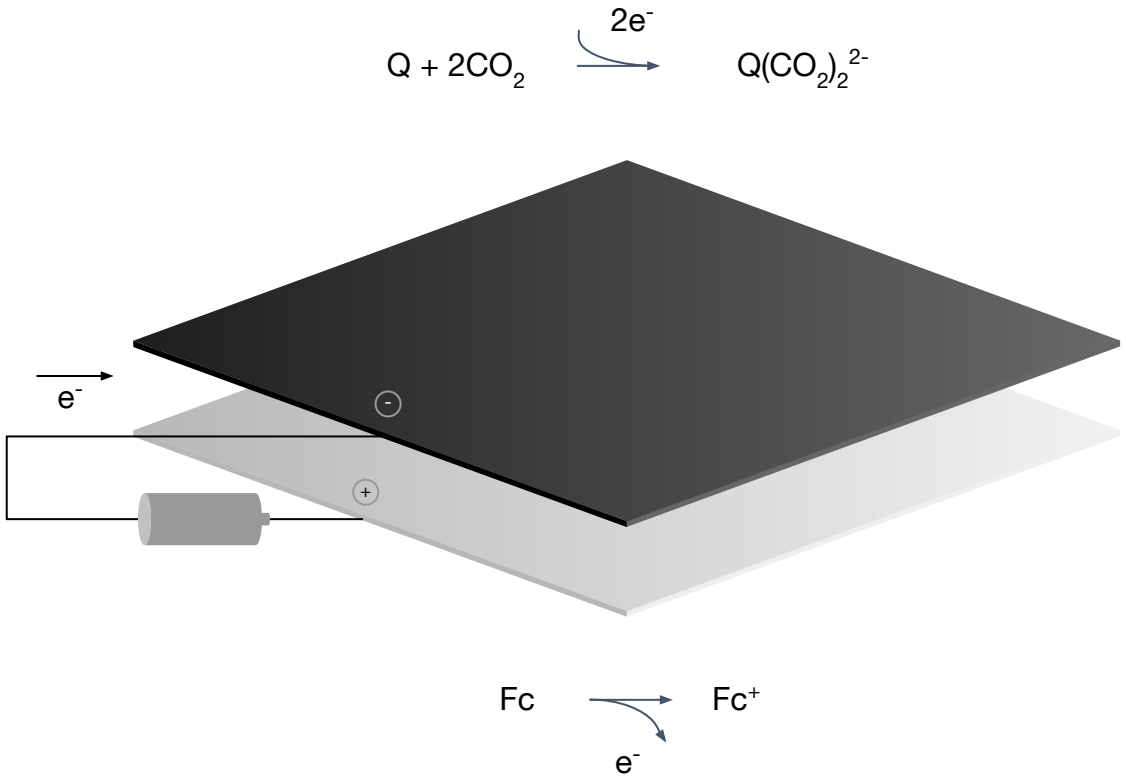
**Matches the rate of charging** (capture) of the capturing electrode

## Counter electrode

# Electro-swing adsorption (ESA)

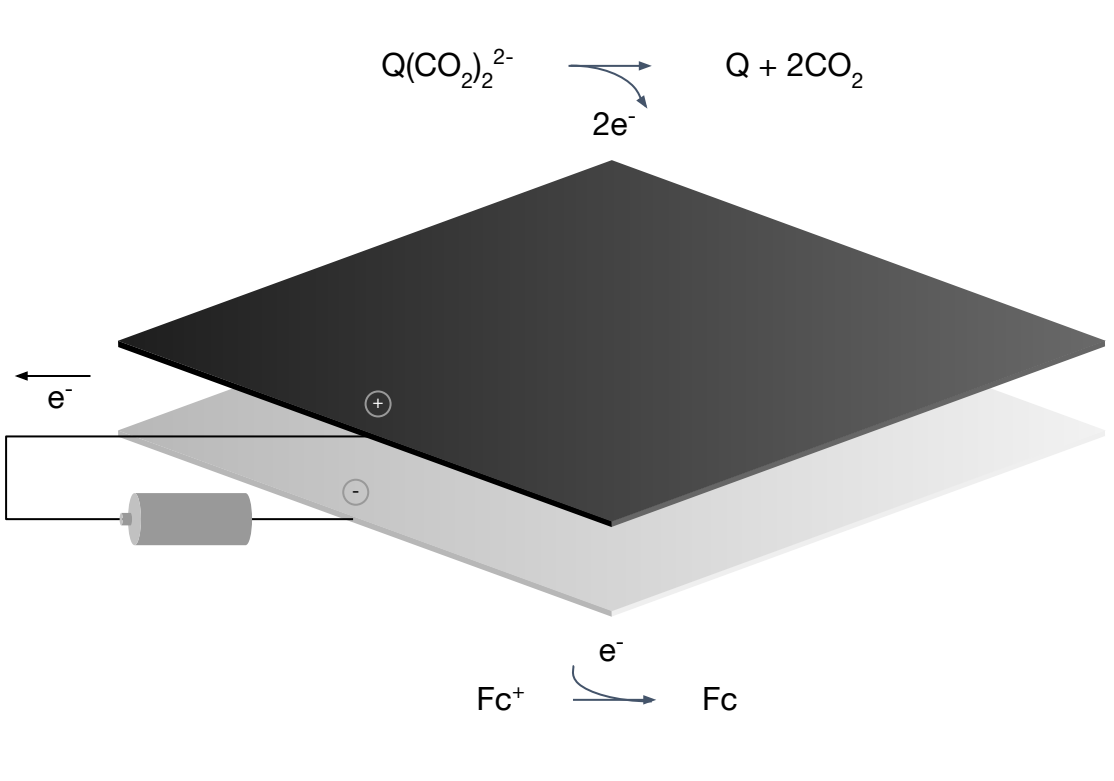
Voskian et al. US Patent 10,464,018

## Adsorption




*Reverse Polarity*

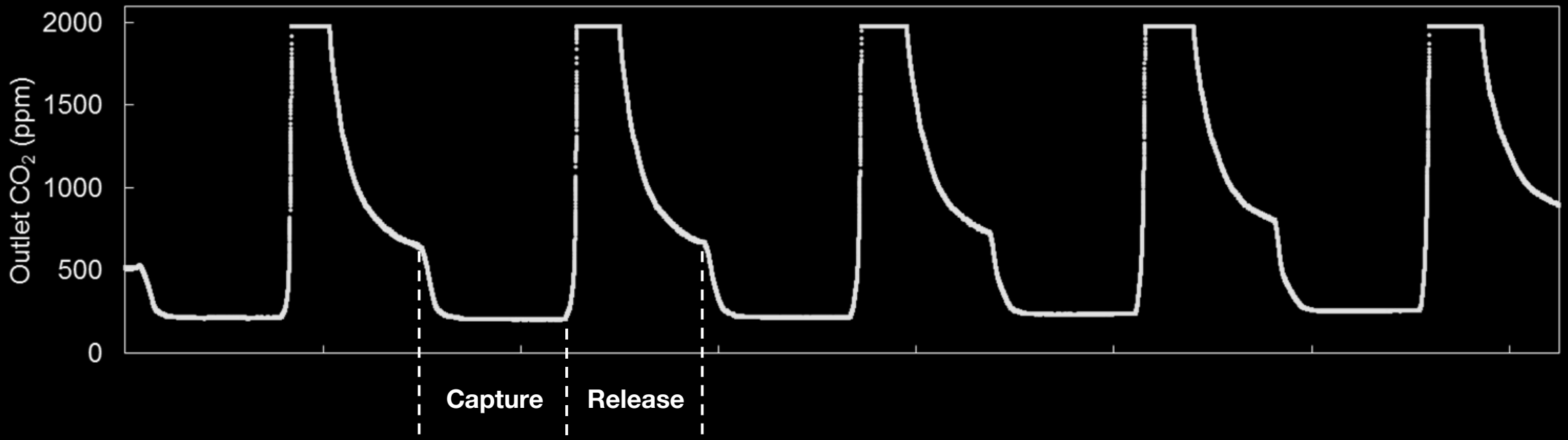
## Desorption



# Device Performance

## The electrochemical cells demonstrate desired component performance

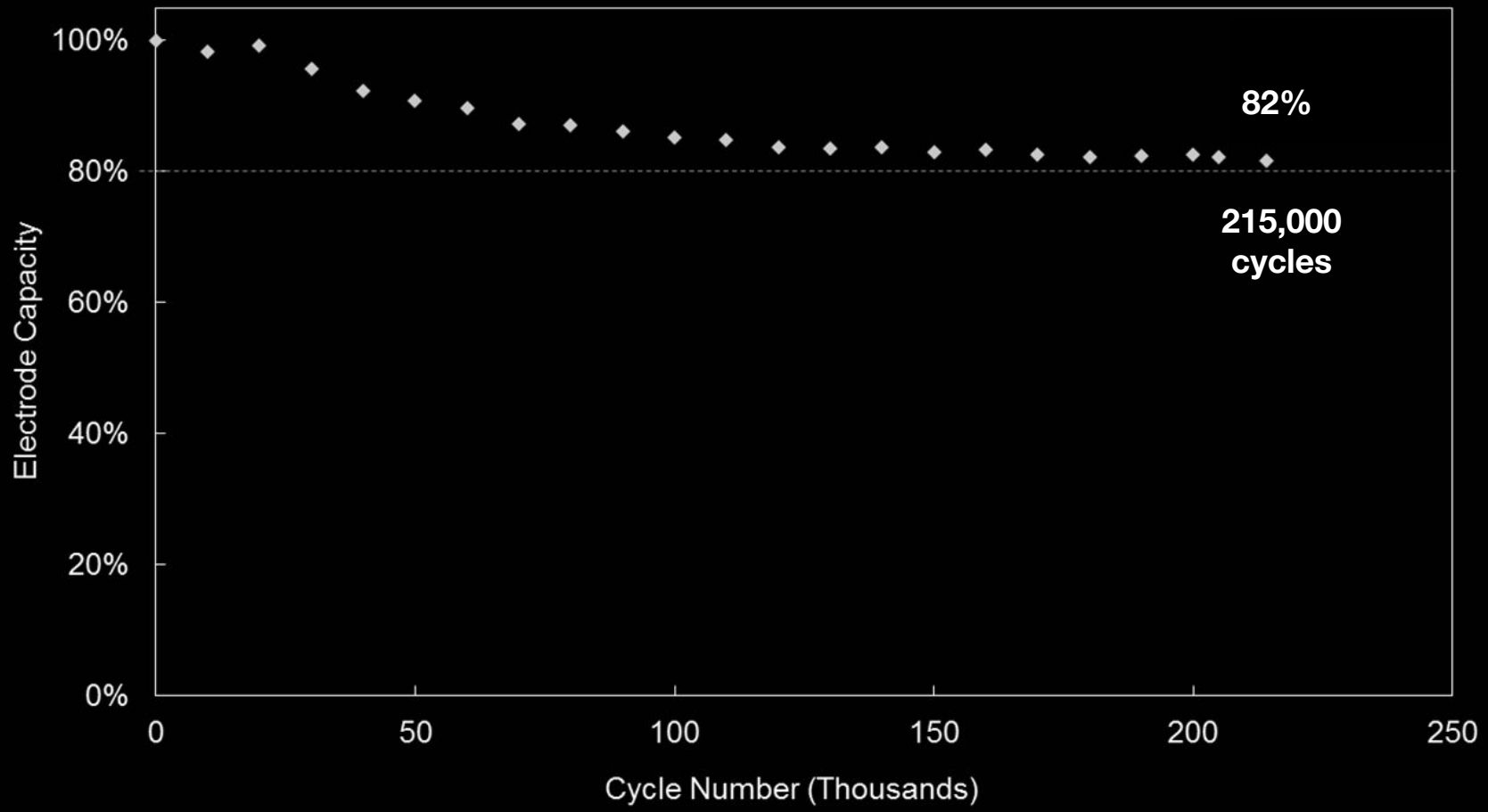
- Continuous carbon capture and release cycles
- Feed of 400 – 500 ppm



# Device Durability

## Electrodes with generational polymers show superb durability

- These results **demonstrate the stability of the polymer backbone**
- The tests also **validates the viability of the ESA technology** for long duration carbon removal



# Potential Applications for Verdox's Technology

## Emitters

Removing $CO_2$, $SO_X$, $NO_X$ from **industrial gas streams** including plant **emissions**

Removal of $CO_2$ from **enclosed spaces** such as buildings or submarines

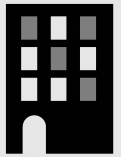
Cleanup of **vehicle and vessel emissions**

## Users

Improving **agricultural productivity** in greenhouses, algae ponds, and fields

Geologic injection for **permanent storage** or **recovery** of natural resources

As a working fluid in **refrigeration** and **food preservation**

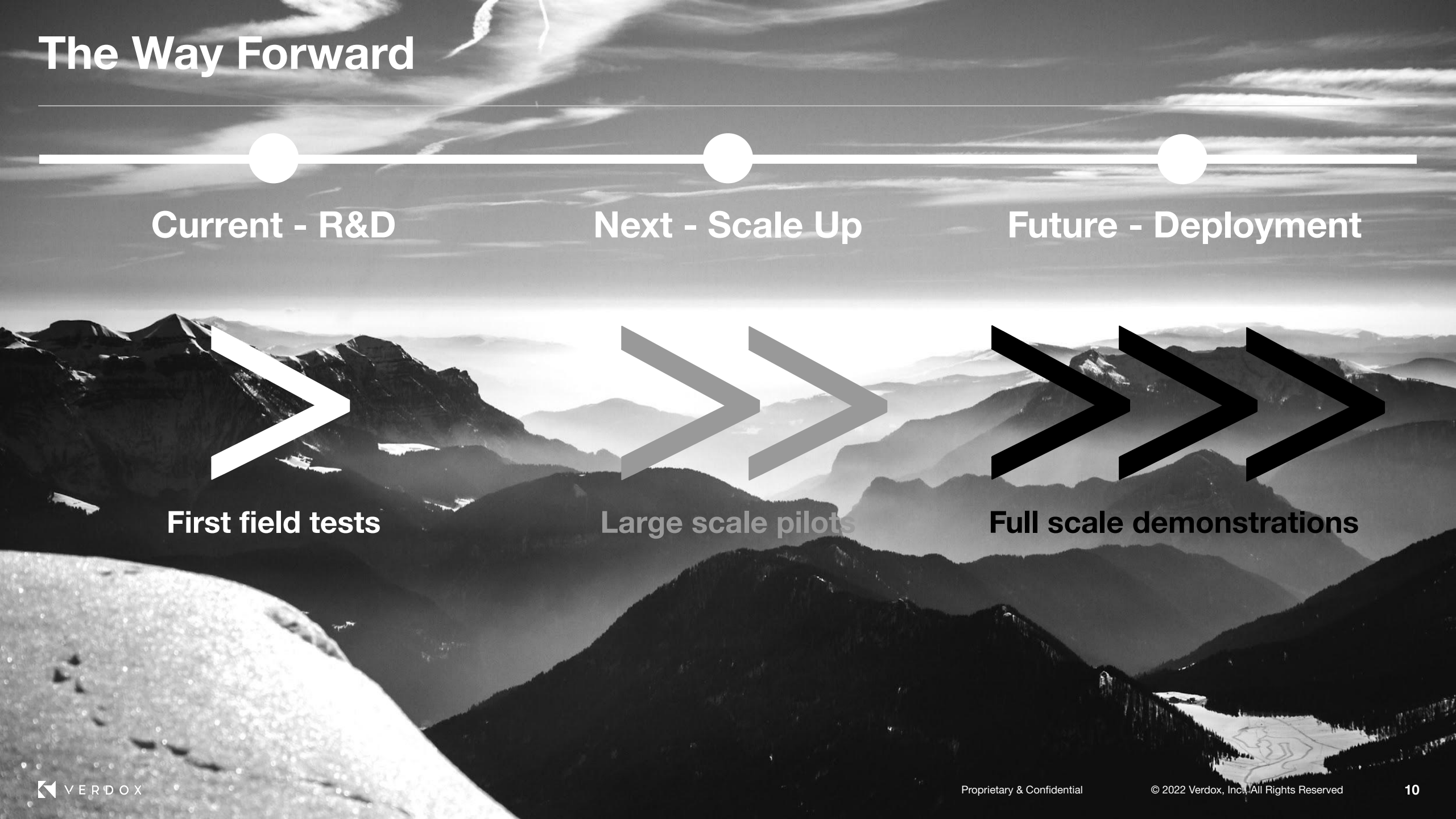


Storage as a component of **building materials**

Providing **fizz** in beverages

Feedstock for **synthetic fuels**

# The Way Forward



## Current - R&D

First field tests

## Next - Scale Up

Large scale pilots

## Future - Deployment

Full scale demonstrations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