STANFORD CARBON REMOVAL INITIATIVE
Precourt Institute for Energy and Woods Institute for the Environment

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SCRI Leadership

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Vision: Create science-based opportunities and solutions for gigaton-scale negative emissions and atmospheric carbon removal

Mission: Enable removal of atmospheric greenhouse gasses at scale by generating and integrating knowledge, creating scalable solutions, informing policies for technology deployment and governance, and demonstrating approaches. This will be done with a focus on social acceptance, equity, and environmental, economic, and social costs.
Focus Areas

1. Atmospheric Restoration
   - Methane Removal
   - CO₂ Removal
   - N₂O Removal
2. Natural Climate Solutions
3. Carbon Uses & Disposition
   - CCS (capture, storage, BECCS)
   - Utilization
4. Integrated Systems Modeling
5. Community Benefits and Impacts
Initial Focus

Flagship projects:
- Multi-year
- Multi-PI
- Innovation to Impact
- Multiple sub-projects
- Whole new area of pursuit

Initial Flagship Projects
- Atmospheric Restoration
- Natural Climate Solutions
Atmospheric Restoration

Goal:
Build prototypes and eventually a test facility to allow researchers to experiment with different techniques for GHG emission removal (CO₂, CH₄, N₂O) to find new energy efficient and scalable solutions.

Approach (Scope of Work):
Technology development effort with subprojects in the areas of:

- **CH₄ Removal**: Goal is for solutions that work for non-flareable concentrations, from thousands of ppm down to 2 ppm, on a path to long term lifecycle costs of < $100/t CO₂eq.
- **CO₂ Removal**: Projects to focus on reducing the lifecycle costs down to < $100/t.
- **N₂O Removal**: Innovative solutions for removal and/or transformation of N₂O, the 3rd most important GHG in terms of radiative forcing are also in scope.
Natural Climate Solutions

Goal:
Map the landscape of opportunities and barriers for Natural Climate Solutions, in California and other regions, with a focus on realistic potential for 2025, 2045, and 2100.

Approach (Scope of Work):
Combine observations, earth system modeling, and empirical studies to provide high-resolution recipes for project-level and jurisdictional deployment of strategies for increasing carbon stocks in forests and soils and for capturing energy from waste. Sub projects in the areas of:

- Background ecosystem carbon sinks
- Reforestation, afforestation, and improved forest management
- Soils
- Waste to energy with CCS
SCRI Affiliates Program

Benefits
- Engage with Stanford faculty, post docs, and PhD students on cutting edge research
- Connect with other companies in shared research-related programming
- Research open to all affiliate members (no IP terms)
- Invitations to SCRI, Precourt Institute for Energy and Stanford University events

Membership Tiers
- $500,000 - $1,000,000 – Founder
- $250,000 – Advisory board
- $100,000 – Regular member
- $25,000 – NGOs, non-profits, startups
Vision of Success

5 years – measurable impacts

- Stanford will have launched a portfolio of foundational research approaches to increase chances of a breakthrough in carbon removal (6-7 R&D approaches in parallel).
- Stanford will have developed tools that identify good carbon removal projects (analyses and data sets, financial tools and instruments).
- Stanford will have identified options that aren’t likely to work.
- Stanford will have realistic expectations for nature based GHG removal efforts.
- Stanford will have clarified carbon accounting of natural climate solutions
- Understand holistically the connections between technology, policy, finance, infrastructure, social acceptance and ability to identify viable scalable approaches, including development of a toolbox to allow one to quickly assess impacts and options.

10-20 years – measurable impacts

- Dramatically advanced opportunity mapping (including environmental, social, and equity-based issues)
- Experimental solutions and deployment at scale across range of technologies
- Monitoring and evaluation protocols to assess performance of projects
- No longer needed!