Introductions

Name, occupation, favorite thing about living/working in [site]

Pre-Survey

Agenda

- Background
- Lunch + Q&A
- Small groups
- Group presentations
- Wrap-up

Workshop Goals

- Offer background on carbon dioxide removal via direct air capture
- Provide overview of community engagement, incl. CBAs
- Learn from you whether there might be community interest in a direct air capture project and if so, under what conditions

Relevance to [Site]

Extreme weather:

- Longer and hotter summers
- More frequent droughts

Campbell County rancher Eric Barlow surveys the family ranch September, 2021

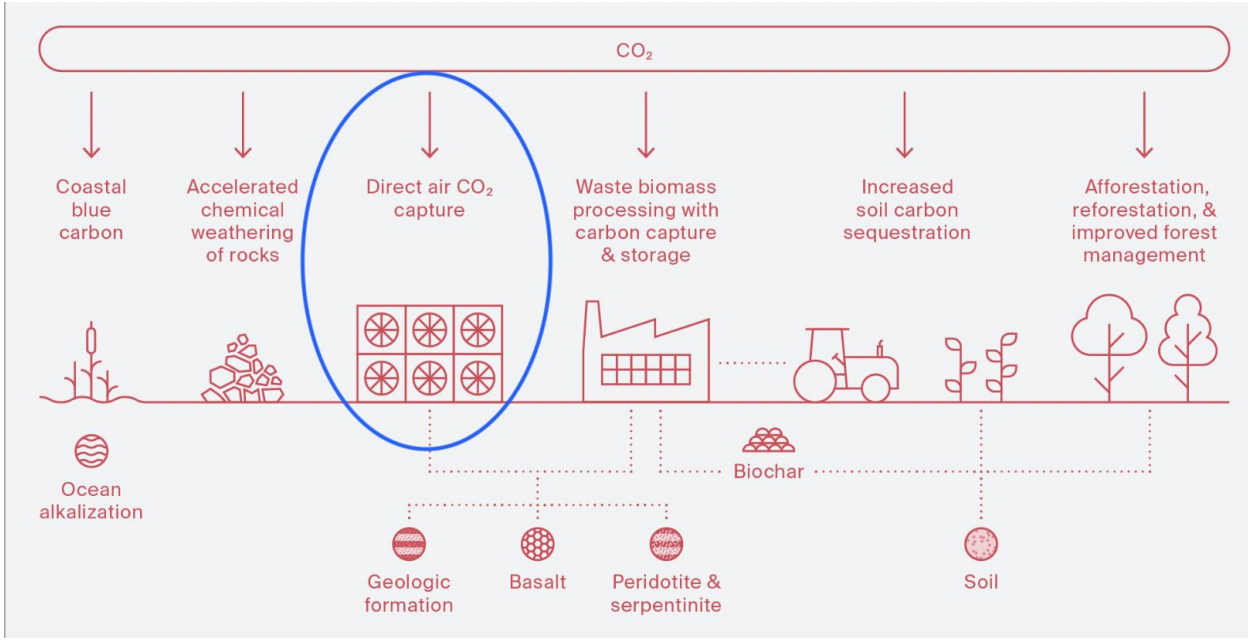
Source: Energy News Network

Researchers now say that to limit extreme weather impacts, we need to remove past emissions too.

One Potential Solution: Carbon Dioxide Removal Through Direct Air Capture

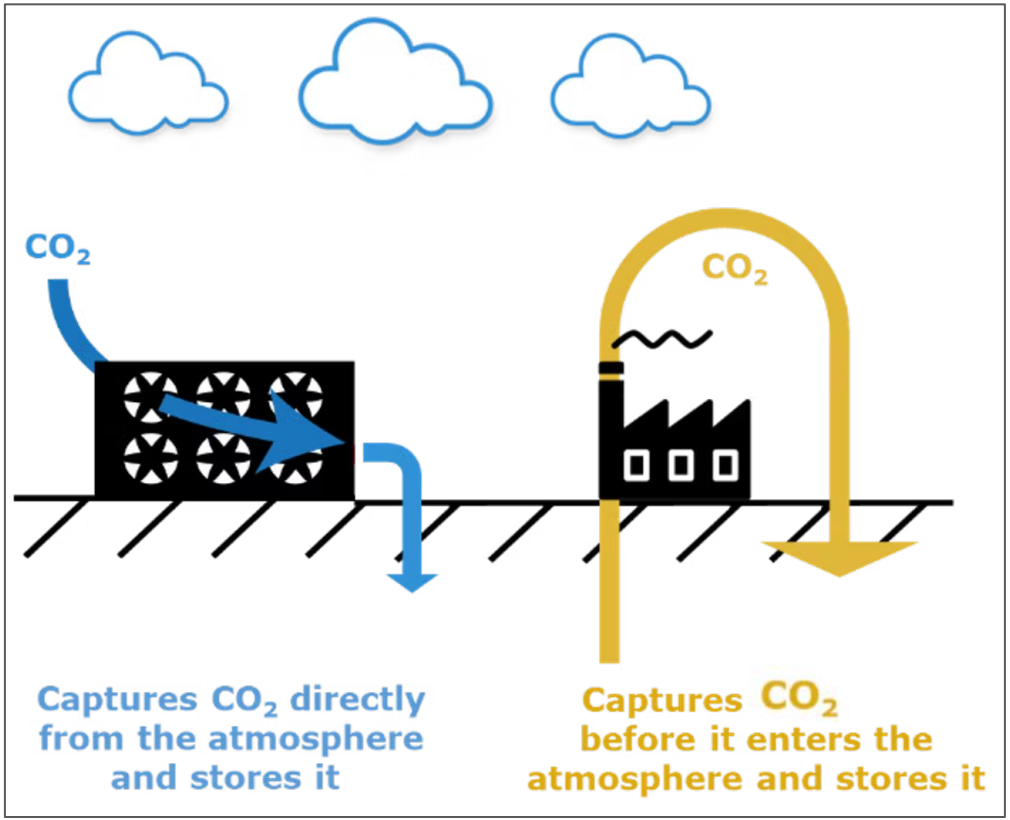
Carbon Dioxide Removal + Direct Air Capture

Carbon dioxide removal (CDR) is the process of removing pre-existing CO_2 emissions from the atmosphere.



Direct Air Capture (DAC) removes CO_2 from open air using an air filtration system. CO_2 is then stored deep underground or repurposed for commercial use.

Carbon capture & storage vs. Carbon dioxide removal



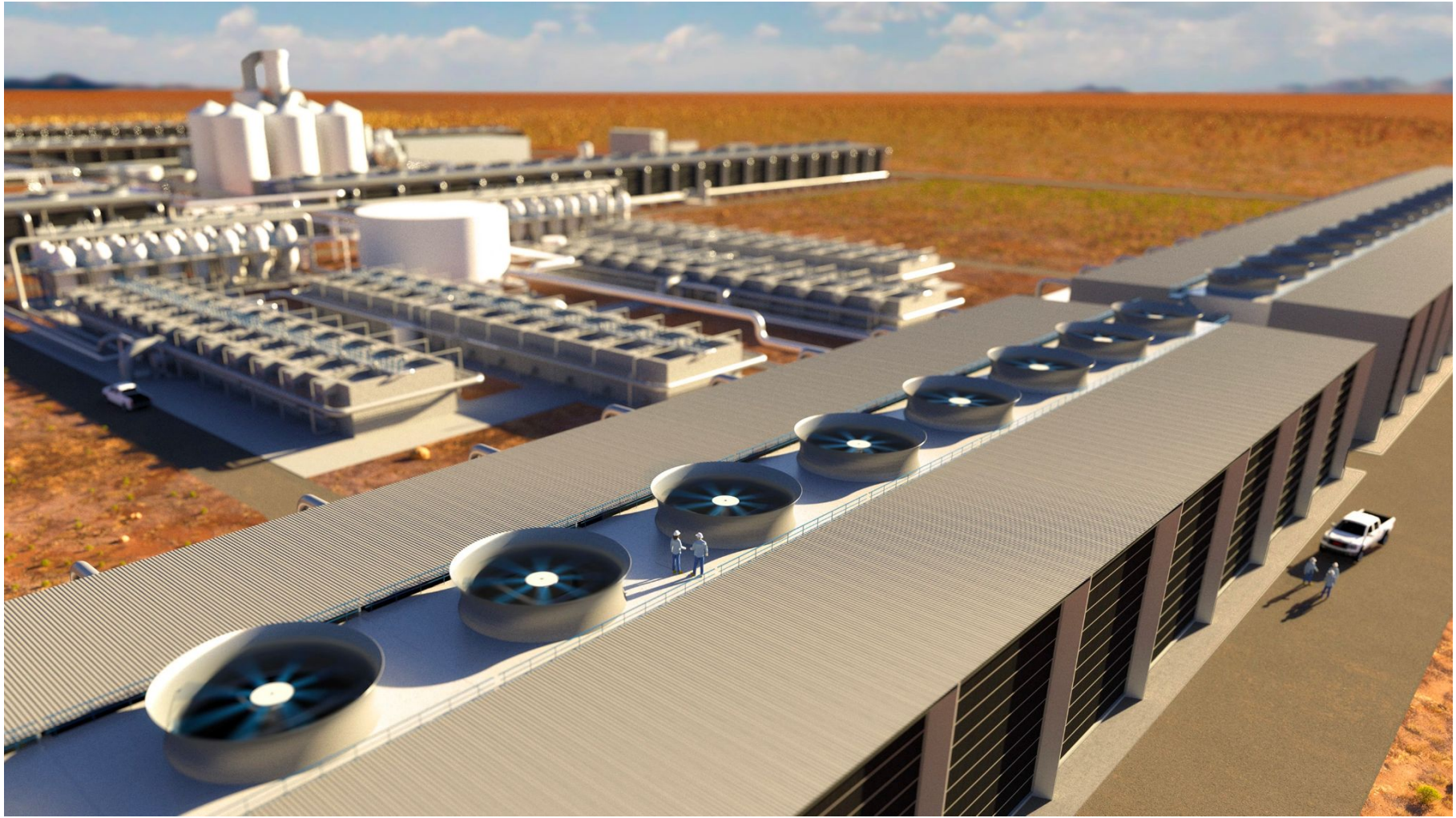
Carbon capture & storage (CCS):

- Filters out emissions as they enter the atmosphere from “point sources”

Carbon dioxide removal (CDR):

- Removes past emissions from the atmosphere

What Does Direct Air Capture Look Like?



Technology Providers

Heirloom

LOW CARBON VENTURES

Sustæra

Global Thermostat

CLIMEWORKS

Carbon Engineering

MISSION ZERO TECHNOLOGIES

Differences in Direct Air Capture Technologies

- **Energy Source**
  - Renewable energy (wind or solar)
  - Nuclear energy
  - Existing electricity grid mix
  - Fossil fuel energy
- **Heat Source**
  - Waste heat from industrial facilities
  - Heat pump
    - Existing electricity grid
    - Renewable energy (wind, solar)
    - Fossil fuels
  - Fossil fuel heat
  - Geothermal
- **Storage**
  - As a gas or liquid underground
  - As rock underground
  - As materials
- **Transportation**
  - On-site
  - Train
  - Trucks
  - Pipelines

Potential Local Concerns

- **Waste products**
  - Sorbent & solvent “filters”
- **Emissions & leakage**
  - Emissions come from energy source
  - Risk of CO_2 leaking as a gas during storage & transport processes
- **Water**
  - Risk of CO_2 leaking into groundwater
- **Earthquakes**
  - Similar risks to other underground activities
  - Early-warning systems at various stages of developed

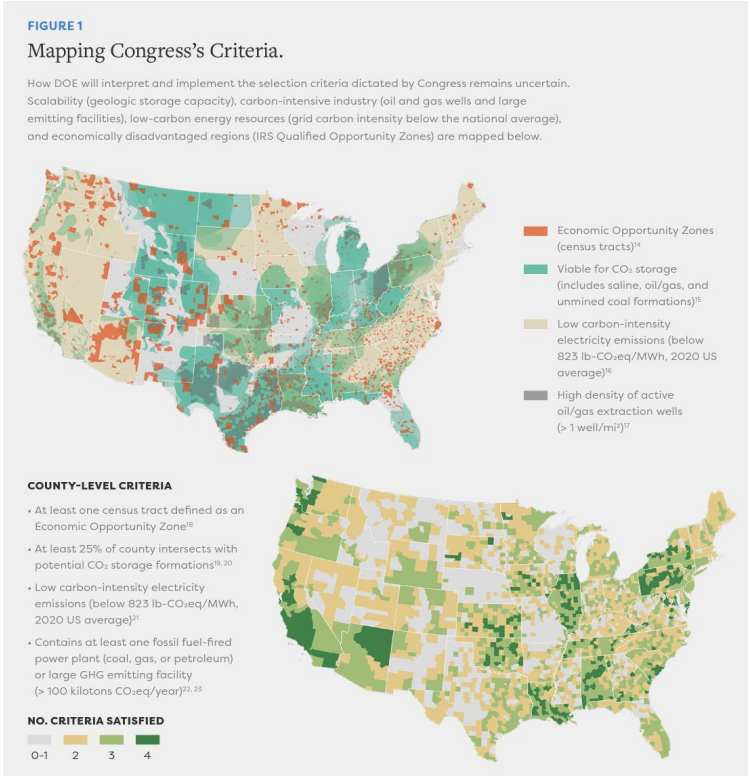
Potential Local Benefits

- **Jobs**
  - Modeling suggests 250+ new, permanent jobs per facility (drawing on various skill-sets)
    - Many more temporary jobs in construction phases (potentially 1,000+)
    - Modeling often over-promises jobs in new industries
  - Many of the same skill-sets, infrastructure, and siting required to take carbon pollution out of the atmosphere as those previously used to put it into the atmosphere
- **Community Benefits**

Why [site]?

Criteria for Direct Air Capture Sites

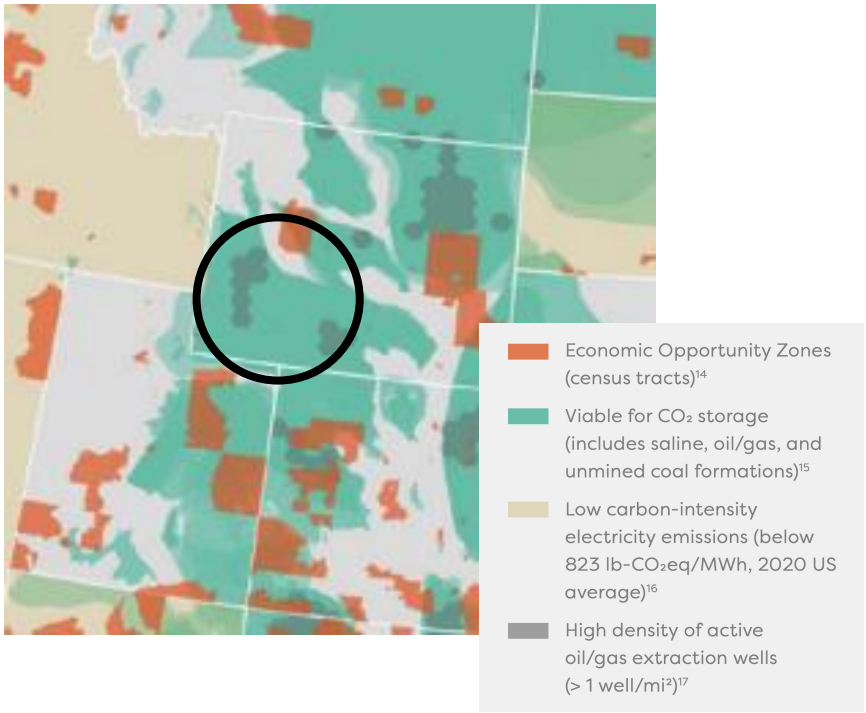
- **Carbon Intensity Of Local Industry**
  - Prioritized near existing or recently retired carbon-intensive fuel or industrial operations
  - Rock Spring's history of coal and natural gas infrastructure
- **Geographic Diversity**
  - Portfolio of hubs across different U.S. regions
  - Workshops: Texas, Pennsylvania, California, Wyoming
- **Carbon Potential**
  - Regions with high potential for carbon storage or utilization
  - Rock Springs has high storage potential due to depleted oil & gas wells



Source: Carbon180

Criteria for Direct Air Capture Sites Cont'd

- **Fossil Economy**
  - Economic opportunity zones with high concentrations of fossil energy resources
  - Rock Springs meets these criteria
- **Employment**
  - Maximize potential to provide skilled training and long-term employment opportunities for residents
  - DAC has the potential to create jobs and boost the economy



Source: Carbon180

How are local community benefits delivered?

Community involvement in DAC Hubs

- A DAC hub could cost upwards of $1 billion to build
- Each of the four hubs will receive ~$875 million for a total of $3.5 billion disbursed
- Multiple ways for communities or community members to engage:
  - Project planning
  - Implementation
  - Ownership

Community Benefits Agreements

What is a community benefits agreement?

- Legal document outlining benefits a project developer will give a community in exchange for a new development
- CBAs can be used on a variety of projects:
  - Sports stadiums
  - Renewable energy developments
  - Oil and gas developments
  - Carbon removal developments

What can a community benefit agreement provide?

- Guarantees to hire local workers
- Living wage guarantees
- Job training and educational services
- New community development projects

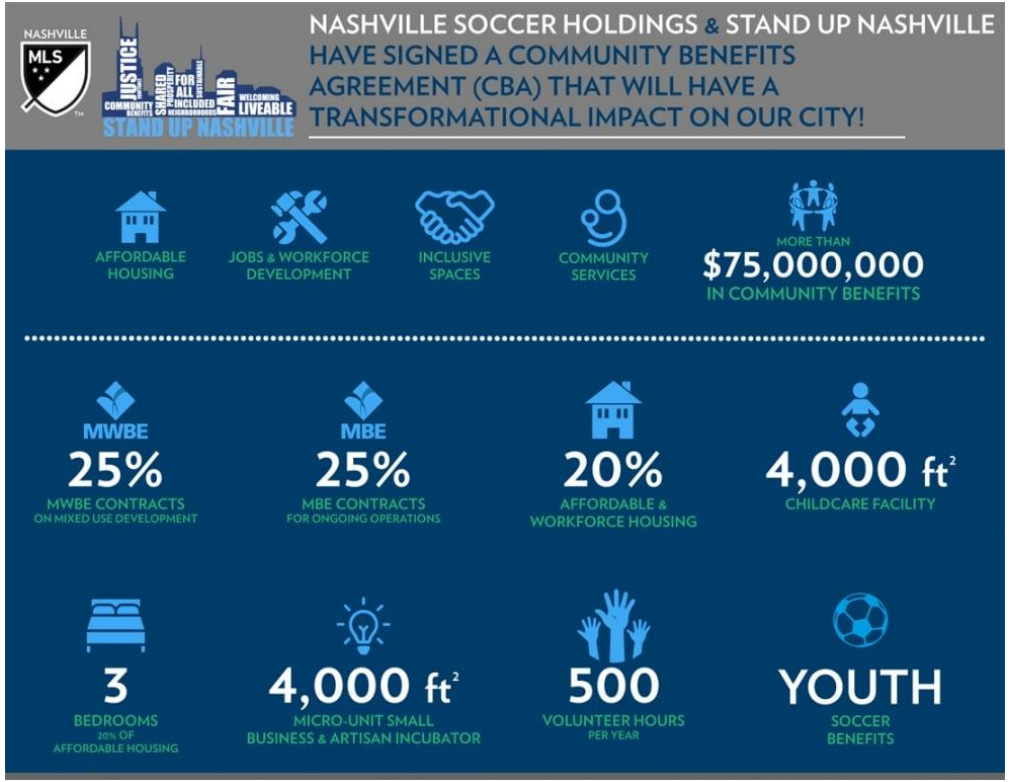
Community Benefits Agreements (CBAs) Cont'd

How does a community benefits agreement form?

1. Community coalition forms
2. Coalition engages community members and identifies priorities
3. Coalition negotiates with developer
4. CBA is signed

Source: Local Initiatives Support Corporation (LISC)

Example of CBA



Source: Virginia Public Media

- Nashville gave $255 million for new soccer stadium, CBA won **an estimated $75 million in benefits** for the community:
  - 20% affordable housing units near stadium
  - $15.50/hour minimum wage for stadium workers
  - New community childcare facility
  - Retail space for local businesses with reduced rental rate

Lunch and Questions?

Please also feel free to reach out with insights, questions, comments, suggestions, or concerns: celinasb@stanford.edu

Breakout groups

Post-Survey

Take 5 mins to complete the post-survey

Questions?

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