ROADS TO REMOVAL
OPTIONS FOR CARBON DIOXIDE REMOVAL IN THE UNITED STATES

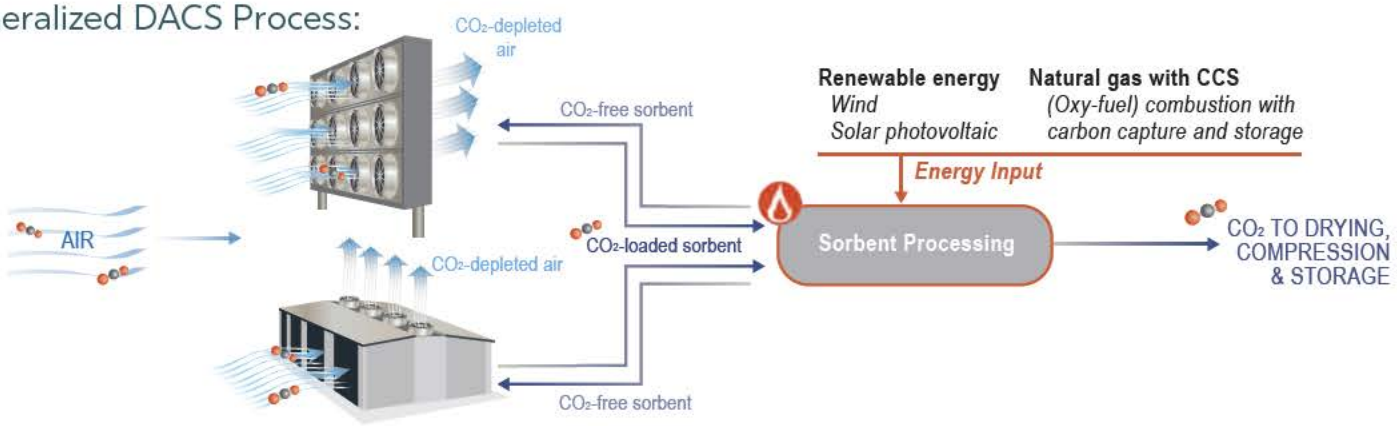
DIRECT AIR CAPTURE & STORAGE

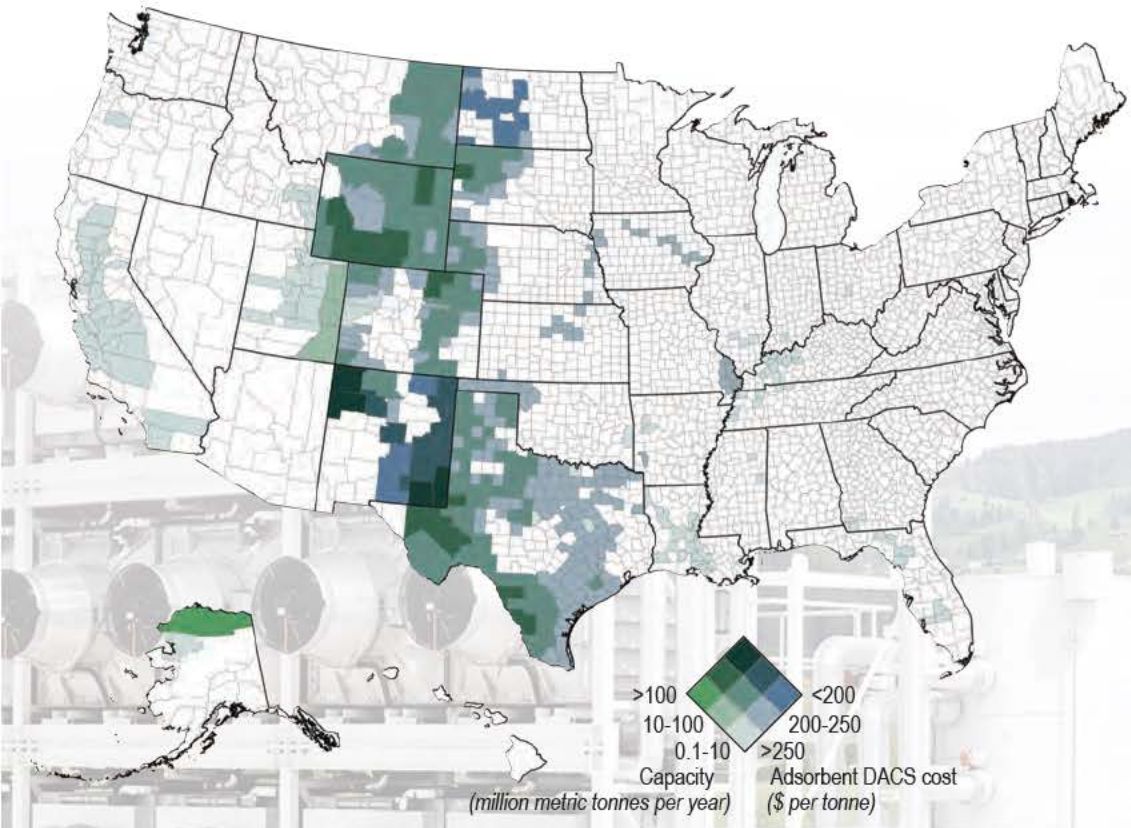
Direct Air Capture with Storage (DACS) Paired with Renewable Energy

- Direct air capture uses mechanical or passive processes to remove carbon dioxide (CO_2) directly from the atmosphere.
- There is technical potential to remove several billion metric tonnes of atmospheric CO_2 each year with DACS. However, these are land, energy and capital-intensive technologies, and it is expected that social, ecological, regulatory and market factors will limit the total removal potential of DACS.
- To maximize efficiency and avoid competing with energy decarbonization, DACS should be sited where there is abundant renewable energy and close to suitable geologic CO_2 storage.

> **"We have more than enough opportunities to deploy direct air capture with wind and solar energy to get us to the gigatonne scale of CO_2 removal and net-zero emissions."**
>
> Dr. Simon Pang
> *Lead Author, DACS*
> *Lawrence Livermore National Laboratory*

Generalized DACS Process:





Key Findings:

- Prioritizing DACS development in regions experiencing job loss in fossil fuel sectors can bring new jobs and economic resilience to these areas.
- DACS is a long-term CO_2 removal solution that will need to scale once all other decarbonization and CO_2 removal approaches have been maximized.
- Targeted near-term DACS deployment is critical to improving efficiency, reducing costs, and guiding the establishment of rigorous monitoring, reporting and verification standards for captured CO_2.

Every region has a story. Every region has an opportunity

To learn more about each carbon dioxide removal pathway, go to **Roads2Removal.org**