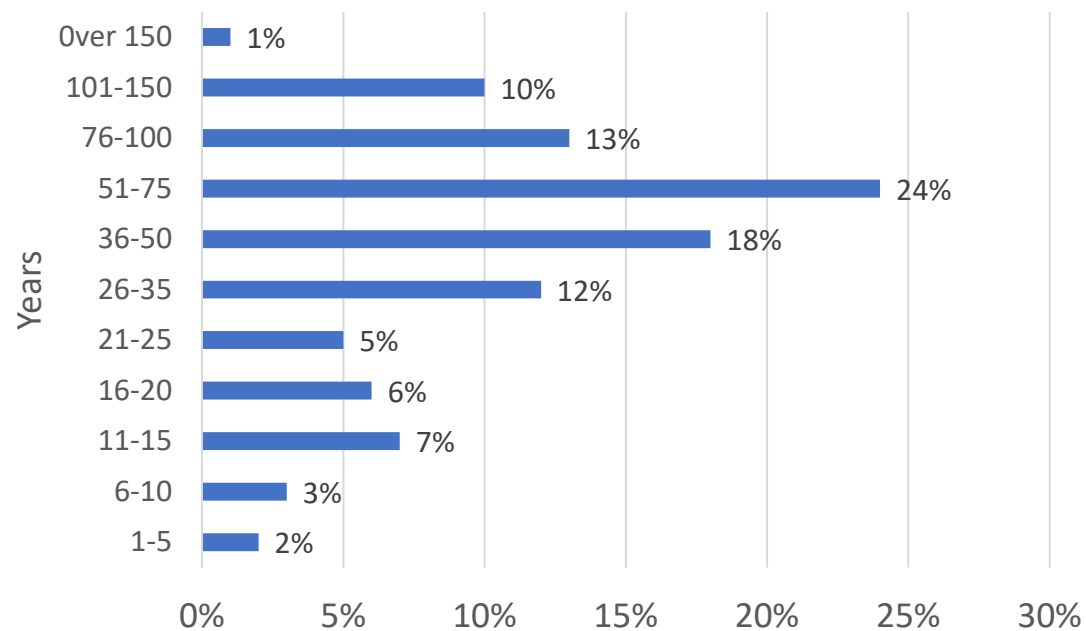


Potential Factors Impacting

HVAC-DAC Deployment

Aging Building Stock

Age of Commercial Building Stock, 2018 (1)



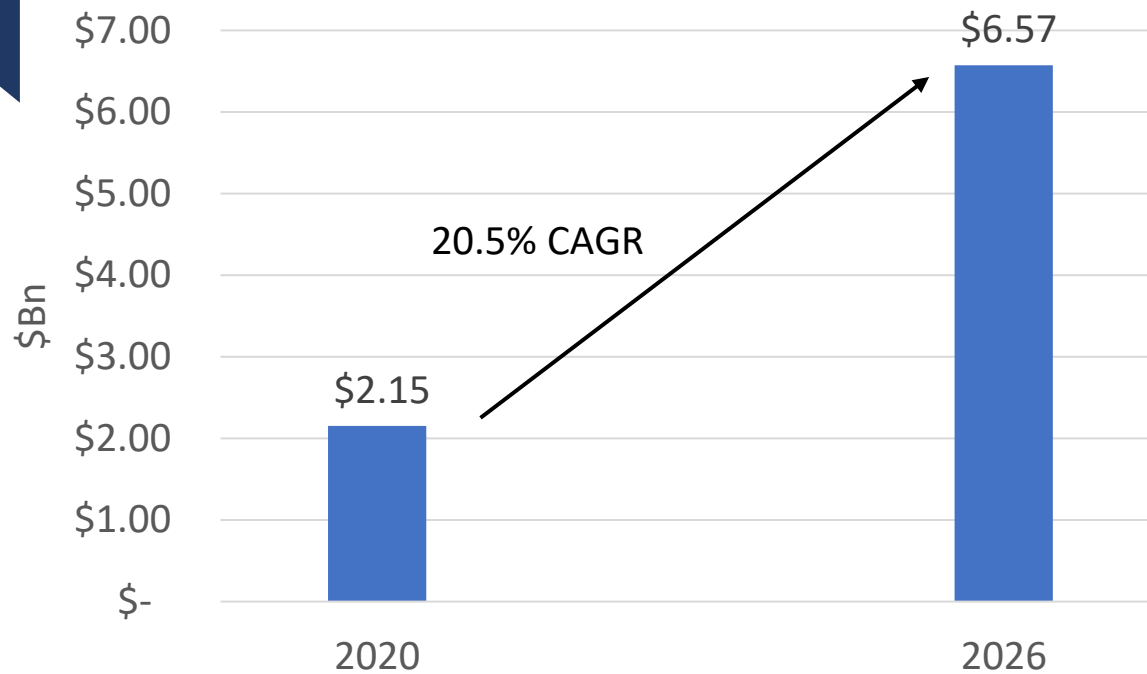
(1) Principia's Commercial Building Trends

Implications

- Replacement/retrofit market key to impact
- Existing roof infrastructure constrains unit footprint
- Structural limits
- O&M plans established

New Technology

Projected Global Occupancy Sensor Market (1)



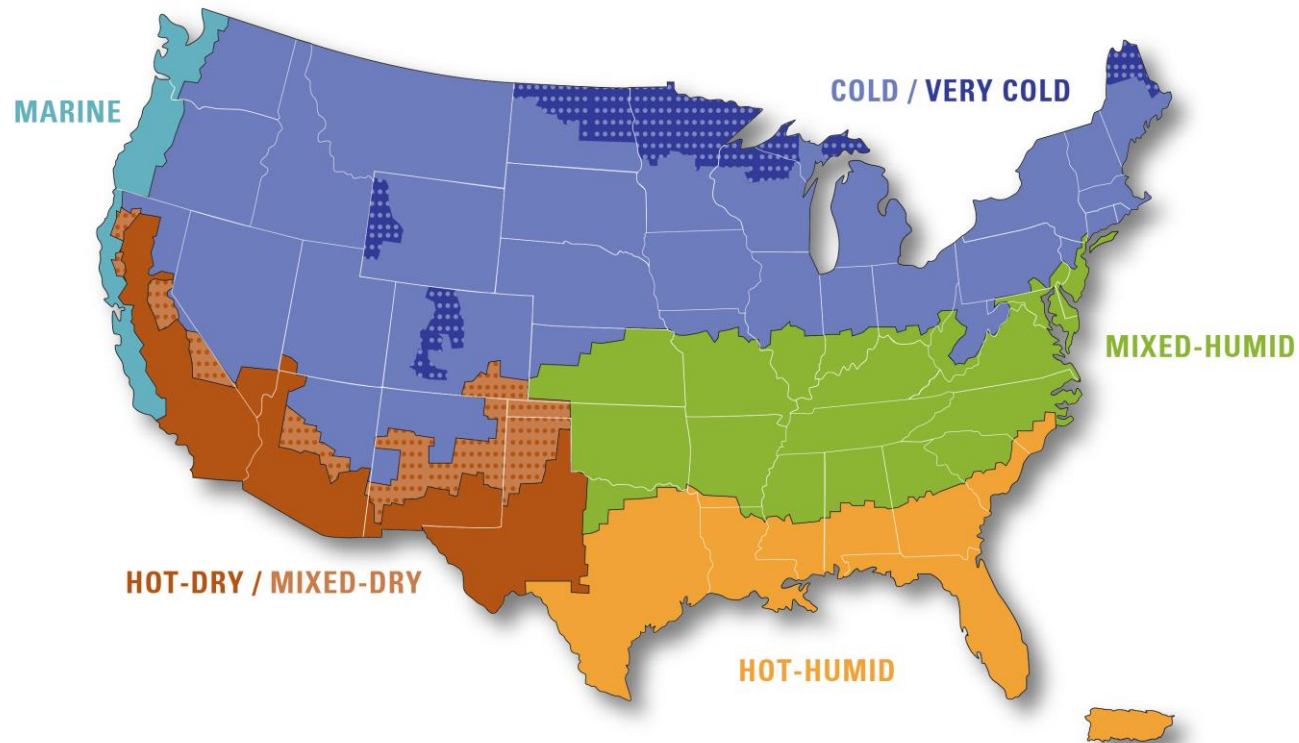
(1) Mordorintelligence

Implications

- Does variable HVAC operation impact DAC?
 - Design
 - Materials
- Integration into BMS

Market Segments

Climate



Building Use

- Commercial
- Education
- Healthcare
- Lodging
- Warehouse
- Industrial

Ownership Structure

- Split incentive

What to do with the CO₂?

Challenges

- geographically disperse sources
- batch production
- small qty <10 ton/yr



Potential Pathways

- onsite use
- onsite conversion
- offsite use/storage



Code and Standards

Today

- ASHRAE 90.1 focused on energy efficiency
- ASHRAE 62.1/170 focused on IAQ via ventilation rate and occupancy

Tomorrow

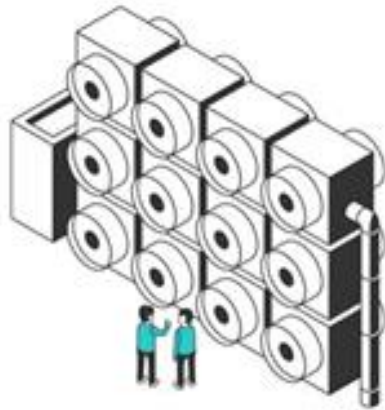
- Market adoption may be driven by policy or carbon markets

Implication

- Will codes need to be modified to align with new technology?
- Do new testing procedures need to be developed?

Is this possible?

DAC TODAY



DECENTRALIZED DAC

