

## OPPORTUNITY

How much energy can be saved by bringing in less outside air?

**7% DECREASE IN ENERGY USE INTENSITY (EUI)** from bringing in less outside air to meet ventilation requirements.<sup>1</sup> The air in a building can be replaced between 10 to 20 times a day.<sup>2</sup>

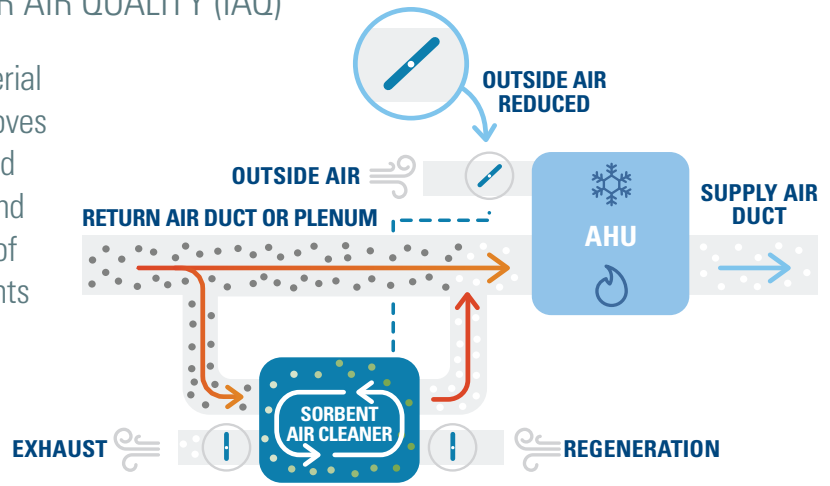
## TECHNOLOGY

How does sorbent air cleaning for HVAC load reduction work?

### CLEANS INDOOR AIR

SO LESS OUTSIDE AIR IS REQUIRED TO ACHIEVE GOOD INDOOR AIR QUALITY (IAQ)

Absorbent material selectively removes indoor-generated contaminants and reduces intake of outdoor pollutants



## M&V

Where did Measurement and Verification occur?

**NATIONAL RENEWABLE ENERGY LABORATORY (NREL)** assessed sorbent air cleaning provided by enVerid at multiple commercial and educational buildings in the Eastern and Southern United States.

## RESULTS

How did sorbent air cleaning for HVAC load reduction perform in M&V?

**IMPROVED IAQ AND HUMIDITY CONTROL**

WITH LOWER VENTILATION RATES<sup>3</sup>

**6%-37% COOLING SAVINGS**

DURING PEAK COOLING MONTH<sup>4</sup>

**ADD-ON INSTALLATION**

OUTDOOR DAMPERS MUST BE OPERABLE AND CONTROLLABLE<sup>5</sup>

### Modeled Energy Savings Across Climate Zones

Highest energy savings in climates with extreme hot or cold temperatures

Location		Annual Energy Savings per SF		Peak Demand Reduction
CLIMATE ZONE	CITY	COOLING kBtu/sf/yr	HEATING kBtu/sf/yr	JULY PEAK SAVINGS %
1A	Miami, FL	2.57	0	9%
2A	Houston, TX	1.89	0.52	10%
3A	Atlanta, GA	0.99	1.75	8%
3B	Las Vegas, NV	0.72	0.13	6%
4A	New York, NY	0.56	1.64	11%
5A	Chicago, IL	0.30	3.10	7%
<b>AVERAGE MODELED SAVINGS</b>		<b>1.17</b>	<b>1.19</b>	<b>9%</b>

Modeling assumes one air cleaning module for a medium-sized office building (53,600 ft<sup>2</sup>). Gas is only used for heating ventilation air, space heating is controlled by electric reheat coils.

## DEPLOYMENT

Where does M&V recommend deploying sorbent air cleaning for HVAC load reduction?

### SITE SPECIFIC

- Best suited for hot/humid or cold climates where there is higher energy savings potential, especially when existing HVAC equipment is undersized. The energy cost to run the unit can exceed savings in mild climates.
- Best economics for projects that can benefit from reducing heating and cooling capacity requirements. Modeling estimated capacity reductions between 9% and 20%, depending on location.
- Reducing ventilation rates during periods of high outdoor air humidity or pollution may improve IAQ.
- Not recommended where outside air can't be controlled.

<sup>1</sup>Assessment of the Energy Impacts of Outside Air in the Commercial Sector, K. Benne, B. Griffith, N. Long, and P. Torcellini (NREL), D. Crawley and T. Logee (DOE), April 2009 <sup>2</sup>Energy Performance Validation of a Gaseous Air Cleaning Technology for Commercial Buildings, Michael Deru and Jason DeGraw (NREL), February 2020, p.13 <sup>3</sup>ibid, p.7 <sup>4</sup>ibid, p.7 <sup>5</sup>ibid, p.38