Building Energy Asset Score: Building Upgrade Guide[1]

HVAC SYSTEMS

A variety of HVAC system upgrades can be considered, depending on the existing configuration. Both equipment replacements and add-on technologies can improve the efficiency of HVAC systems. Some equipment recommendations may suggest implementing the same type of equipment or technology. This implies installing a newer high efficiency version of the current technology. When a "High Efficiency" unit is not specified in an AS report, that unit may not be cost effective. However, it is recommended to consider installing the highest efficiency level when economically feasible.

General HVAC System Improvements

Asset Score Report Recommendation:

Upgrade Fan Motors and Install Variable Frequency Drive (VFD) or Multi-speed Control on Fans
Cost: $$

Based on ASHRAE 90.1 2010, Section 6.4.3.10, air-conditioning equipment with DX cooling greater than 110,000 Btu/hr should have supply fans controlled by two-speed motors or VFD. In addition to installing VFD or multi-speed control, it is recommended that fan motors be upgraded to premium efficiency models. Consider replacing existing VFDs with higher efficiency versions or install VFDs in fan motors without them.

Add Air-Side Economizer
Cost: $ - $$

An economizer helps to provide free cooling to a building by increasing the intake of outside air when conditions are amenable. The economizer may be operated based on either the dry bulb temperature or enthalpy of the outside air, and requires the appropriate sensors. In many locations, differential enthalpy control for the economizer is often preferred, particularly where it is more humid. Costs for adding hardware to support economizers will vary based on the existing system in the building.

Add Energy Recovery ventilation
Cost: $$

Energy recovery ventilators, which transfer energy between the outgoing exhaust/relief and incoming outside air streams, can help reduce energy usage. These systems are more cost-effective in extreme climates, with hot, humid summer and/or cold winters. Energy recovery systems are of two major types: those that recover only sensible energy and those that recover both sensible and latent energy.

[1] The complete Asset Score Building Upgrade Guide is available at: https://buildingenergyscore.energy.gov/assets/energy_asset_score_recommendations_guide.pdf

Improve Performance of Existing System

Cost $ - $$

In addition to the upgrade recommendations provided, overall HVAC system performance may be improved by sealing heating and cooling ducts; adjusting blower components to provide proper system airflow; inspecting cleaning, or changing the air filter in the central air conditioner, furnace, and/or heat pump; ensuring that central air conditioner refrigerant charges meet manufacturer specifications. and by adjusting equipment controls to ensure peak performance.