

Efficiency interventions on HVAC

Efficiency interventions exist on the HVAC system (such as economy cycle, cold-air re-use, heat recovery, evaporative coolers, night temp cycles, etc)

Opportunities for mechanical system retrofits to heating, ventilating, and air conditioning (HVAC) systems are numerous and varied due to the wide assortment of heating and cooling systems and supporting equipment used in buildings. Unlike many lighting retrofits, it can be difficult to determine the energy savings that result from mechanical system retrofits or replacements. Savings are often highly dependent on both the weather and the efficiency of the existing system (which can be challenging to measure).

Some of the possible interventions are listed below:

Use ambient air.

Even in summer, early- morning or -evening air is cool. Using an economiser setting to draw in this cool air allows the HVAC system to utilise outdoor air, by varying the supply airflow according to outdoor air conditions. This means the chillers need only operate from mid-morning to late afternoon, resulting in significant energy savings.

Application: All HVACs
Ease: 3/5
Availability 3/5

Keep thermostat within 10°C of the ambient temperature.

Keeping the thermostat within 10°C of the ambient temperature can save up to 33% of HVAC energy. So called smart thermostats do this automatically by overriding unnecessarily high or low settings.

Application: All HVACs. Smart thermostats should be considered on new installations.
Ease: 5/5
Availability 4/5

Reduce HVAC load by minimizing sources of heat.

Electrical devices produce differing degrees of unwanted heat that only serve to increase the HVAC load. Chief among these are incandescent lights. Eradicating incandescent lights as far as possible can drastically decrease the HVAC load (in addition to saving much electricity).

Other appliances like computers should be turned off when not in use.

Application: Everywhere.
Ease: 5/5

Energy Efficiency and Energy Recovery

Fresh air is essential to healthy people – and healthy buildings. That’s why commercial buildings are required to bring in fresh air – typically 60-80 cubic meters per hour for every occupant. On average the air should change every five to 10 minutes. This unconditioned air greatly increases your building’s air-conditioning load – and since an equal amount of air must be vented outdoors, you’re basically “throwing away” air you’ve paid to cool.

A heat exchanger transfers heat from one medium to another. Common types of heat exchangers are: rotary, sealed, plate, coil run-around system, and hot oil recovery system.

Application: Install heat recovery ventilators that exchange between 50 and 70 percent of the energy between the incoming fresh air and the outgoing return (conditioned) air.

Ease: 2-3/5

Availability 3/5

Other factors to consider:

Minimize exhaust and make-up air. Makeup air depends on the needs of ventilation for personnel, exhaust air from workspaces, porosity of the building envelope, machine air needs, and local health and safety requirements.

- Seal ducts that run through unconditioned space (up to 20 percent of conditioned air can be lost in supply duct run).
- Keep doors closed when air conditioning is running.
- Properly insulate walls and ceilings.
- Insulate air ducts, chilled water, hot water and steam pipes.
- Rewire fans to operate only when lights are switched on, as codes permit.
- Check for damper leakage/ensure tight seals.
- Shut off unneeded exhaust fans and reduce use where possible.
- Reduce air volume lost by reducing exhaust rates to the minimum.
- Review process temperatures.
- Install thermal windows to minimize cooling and heating loss.
- Zone controls
- CO2 sensors
- Variable speed drives

