

According to their findings, the cooling effectiveness and energy efficiency are largely dependent on the dimensions of the airflow passages, air velocity and working-to ...

Cooling the servers continually is one of the highest electricity consumption sources in data centers apart from IT power. Owing to this fact, many research and innovations are employing renewable energy resources to improve the system Power Usage Effectiveness (PUE) [4], [5]. Most of the existing data centers are based on air-cooling technology due to their ...

A first-of-its-kind systems approach to managing air sealing, ventilation, and air distribution during weatherization and home performance improvement projects will help optimize energy ...

This measure guideline offers additional recommendations to heating, ventilation, and air conditioning (HVAC) system designers for optimizing flexible duct, constant-volume HVAC systems using junction boxes within Air Conditioning Contractors of America (ACCA) Manual D guidance (Rutkowski, H. Manual D -- Residential Duct Systems, 3rd edition, Version 1.00).

Natural Cooling Resources. The Solar House: Passive Heating and Cooling by Dan Chiras. Passive Solar Architecture: Heating, Cooling, Ventilation, Daylighting and More Using Natural Flows by David ...

your air conditioner, except on the hottest days. Moving air can remove heat from your home. Moving air also creates a wind ... by the National Renewable Energy Laboratory (NREL), a DOE national laboratory. The ... in the direct path of the airflow. You'll cool more of your home if you force the air to take a longer path between the

Over the past few decades, numerous environmental concerns have been caused by global warming, climate change, ozone depletion, acid rain, air pollution, waste disposal, and water pollution, all of which affect the Earth [1]. Moreover, the worldwide demand for energy and electricity is increasing rapidly [2]. Renewable resources are among the most efficient and ...

A solar chimney - often referred to as a thermal chimney - is a way of improving the natural ventilation of buildings by using convection of air heated by passive solar energy. A simple description of a solar chimney is that of a vertical shaft utilizing solar energy to enhance the natural stack ventilation through a building.. The solar chimney has been in use for centuries, ...

The thermal neutral temperature under stratum ventilation was also found able to be raised to 27 °C [9], which is significantly higher than that under conventional MV at the same supply air flow rate. As such, the

year-round energy saving of conventional air-conditioning system using SV was found to be at least 25% and 44% against those using ...

The Heating, Ventilation, and Air Conditioning (HVAC) system, as one of the most important building mechanical systems, consumes more than 40% of the energy consumption of buildings [1]. HVAC system operation with faults can result in indoor environmental issues, such as poor thermal comfort and indoor air quality that affect occupant health and productivity [[2], [3], ...

In this regard, the importance of air tightness should be emphasized and further investigated. A recent study used the regressed infiltration model in EnergyPlus developed with CONTAM simulation and reported that improving the infiltration could save heating, ventilation and air conditioning (HVAC)-related energy by 6% [12].

While the new refrigerants will reduce the carbon footprint of air conditioners, 80% of cooling's greenhouse gas emissions comes from the energy it consumes. Air conditioning currently accounts for 7% of global greenhouse gas emissions. If we continue with business as usual, emissions from cooling are expected to double by 2030 and to triple ...

Sustainable heating, ventilating, and air-conditioning (HVAC) prioritizes energy efficiency and low environmental impacts in creating the tools, technologies, techniques, practices, and ...

The desiccant air conditioning system has multiple advantages (e.g., no use of ozone-depleting refrigerants, highly efficient moisture control, easy regenerative integration) over traditional vapor-compression refrigeration systems, thus increasingly attracting more research interest. Recently, several studies have been conducted that primarily aimed to enhance the ...

The renewable energy sources are used for different activities viz. heating, lighting, cooking and air conditioning. The renewable energy sources are solar, wind, biomass, geothermal and hydropower. ... (LAMEE) which means higher operating costs for the fans to deliver the air flow in the air conditioning system. 10.

Replacing a dirty, clogged filter with a clean one can lower your air conditioner's energy consumption by 5% to 15%. For central air conditioners, filters are generally located somewhere along the return duct's length. Common filter locations are in walls, ceilings, or in the air conditioner itself.

Moreover, ventilation plays a vital role to assure air-quality inside buildings where widespread sealing is carried out for energy-efficient purposes, as highlighted by Aynsley and Shie [7]. The authors state that there is a risk of toxic mould growth in houses and offices with reduced ventilation, which can lead its occupants to develop sick-building-syndrome symptoms.

A careful analysis of this cited work suggested that a fixed-output air conditioner was used in its experimental comparison. 25.1% to 73.5% energy savings of air conditioners are achievable. The optimized design, especially the use of fuzzy control in the cloud, can achieve a high energy saving ratio while ensuring the comfort of personnel ...

Briefly, the adaptive DCV strategy involves a dynamic multi-zone ventilation equation to determine necessary airflow for a multi-zone air-conditioning system. ... We further describe several renewable energy assisted air-conditioners, such as the absorption and adsorption systems that are heat driven. Such systems present a whole dimension to ...

the energy efficiency of window air conditioners. Window air conditioners are inexpensive, portable, and can be installed by home occupants, making them a good solution for supplemental cooling, for installing air conditioning in homes that lack ductwork, and for renters. As a result, 7.5 million window air conditioners are purchased each year in

The EH device harvests the airflow inside Heating, Ventilation and Air Conditioning (HVAC) systems, using a piezoelectric component and an appropriate customizable aerodynamic appendix or fin that takes advantage of specific airflow phenomena (vortex shedding and galloping), and can be implemented for optimizing the energy consumption inside ...

This guideline responds to the need for an efficient means of identifying, diagnosing, and repairing faults in air conditioning systems in existing homes that are undergoing energy upgrades. Inadequate airflow due to constricted ducts or undersized filters, improper refrigerant charge, and other system defects can be corrected at a fraction of ...

This report presents improved air conditioner (AC) and heat pump (HP) modeling methods in the context of whole-building simulation tools. Its goal is to enable more accurate evaluation of ...

The building sector is significantly contributing to climate change, pollution, and energy crises, thus requiring a rapid shift to more sustainable construction practices. Here, we review the emerging practices of integrating renewable energies in the construction sector, with a focus on energy types, policies, innovations, and perspectives. The energy sources include solar, wind, ...

Sustainable heating, ventilating, and air-conditioning (HVAC) prioritizes energy efficiency and low environmental impacts in creating the tools, technologies, techniques, practices, and methodologies that heat, ventilate, and air-condition buildings. ... PV panels became a choice for building renewable energy in the 1970s but were cost ...

Solar thermal air conditioning harnesses the power of the sun to provide a more sustainable alternative to traditional air conditioning systems. Using solar energy, which is abundant and renewable, this technology

offers a means to reduce the reliance on fossil fuels and decrease utility bills. In this article, we will explore the various types ...

ACCA Air Conditioning Contractors of America ACH Air changes per hour cfm Cubic feet per minute ft/min Feet per minute HVAC Heating, ventilation, and air conditioning NYSERDA New York State Energy Research and Development Authority Pa Pascals RECS Residential Energy Consumption Survey SHGC Solar heat gain coefficient

Your air ducts are one of the most important systems in your home, and if the ducts are poorly sealed or insulated they are likely contributing to higher energy bills. Your home's duct system is a branching network of tubes in the walls, floors, and ceilings; it carries the air from your home's furnace and central air conditioner to each room.

Office of Energy Efficiency & Renewable Energy Operated by the Alliance for Sustainable Energy, LLC ... Heating, Ventilating, and Air-Conditioning Laboratory. The work presented in this report does ... was accomplished by measuring the sensitivity of ...

Full indoor air quality analysis and energy impacts; Disseminate at stakeholder conferences, webinars, and modify training and energy efficiency program policies. For more information, project presentations, and related publications, visit the Energy Savings with Acceptable Indoor Air Quality through Improved Air Flow Control web page.

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