Upgrading commercial pumping systems delivers significant savings to businesses and the planet.

Right-sizing, load matching, and replacing existing pumps with new, more efficient models can save over 10,000 GWh/year. This represents 21% of total commercial pump electricity consumption in the United States.

Total Savings Opportunity in Commercial Pumps[1]

Energy savings per year
13 Natural gas power plants

Cost savings per year
$1.4 Billion

Carbon savings per year
Over 4.5 Million metric tons CO_2

Right-sizing

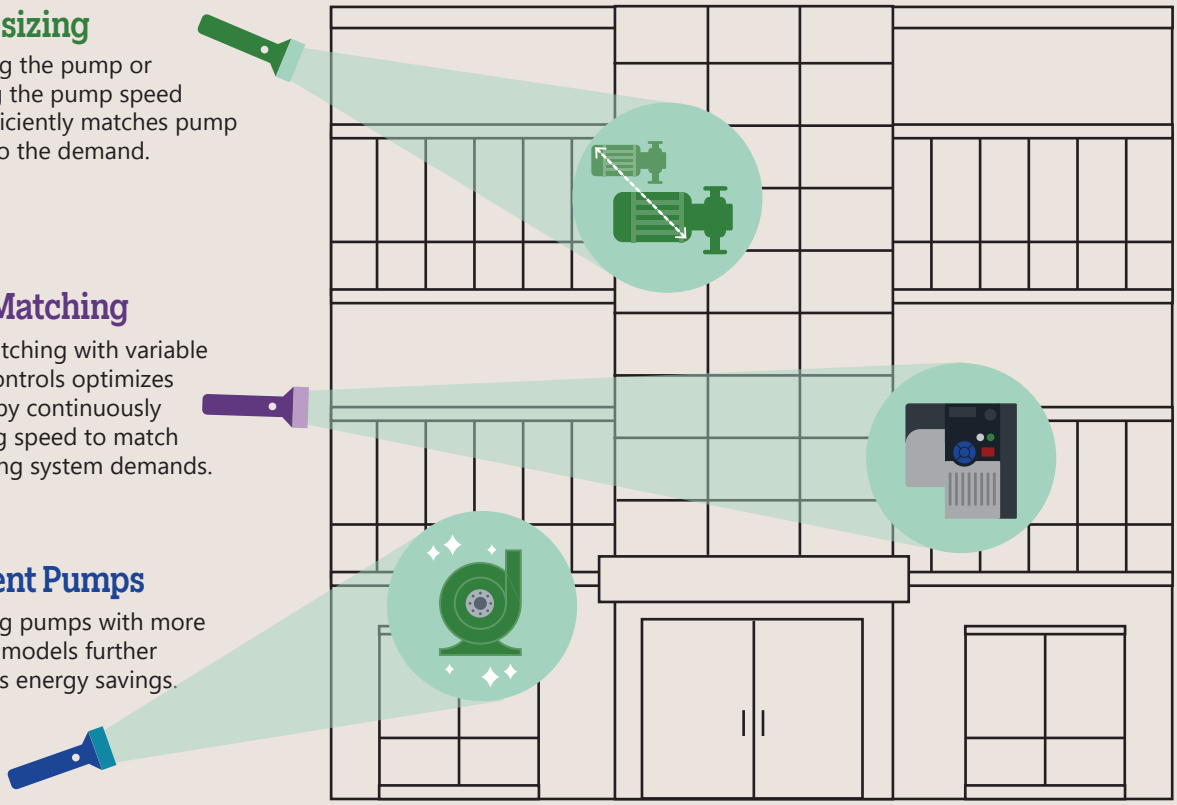
Replacing the pump or reducing the pump speed more efficiently matches pump output to the demand.

Load Matching

Load matching with variable speed controls optimizes savings by continuously adjusting speed to match fluctuating system demands.

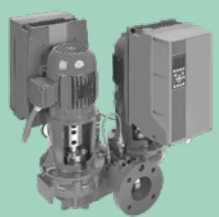
Efficient Pumps

Replacing pumps with more efficient models further enhances energy savings.

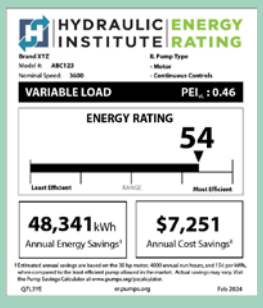


Share of Total Savings, by Opportunity

Smart Pumps make it easy to achieve electricity savings



- **Easier Installation:** Encourages more people to choose variable speed controls.
- **User-Friendly Controls:** Reduces installation errors and ensures better control persistence.
- **Remote Monitoring and Adjustment:** Allows for easy remote access for fault detection and diagnostics and fine-tuning of pump settings.



The ER Label

The Hydraulic Institute Energy Rating Label provides details on the efficiency and savings for a specific pump.

1 The savings potential relies on Cadeo's assessment of DOE's 2021 Motor System Market Assessment, BPA's Adjustable Speed Drive Market Model, and feedback from subject matter experts. For details of the underlying research and computations, please refer to the associated Excel workbook: pumps.org/efficientbuildings.

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THE HIDDEN SAVINGS OPPORTUNITIES INSIDE AMERICA'S COMMERCIAL BUILDINGS

Commercial buildings consume 1.2 Million GWh of the nation's electricity, enough to power nearly 1,500 natural gas power plants for a year. Building owners can save electricity, carbon, and costs through control and efficiency improvements as well as proper commissioning of pumps and fans.

35% of electricity consumption in the US comes from commercial buildings.

20% of commercial electricity consumption comes from pumps and fans.

17% of pump and fan consumption is a savings opportunity—that's **40,101 GWh** of hidden savings.

40,101 GWh of Savings Opportunity for Commercial Pump and Fan Systems equals[1]

Energy savings per year
49 Natural gas power plants

Cost savings per year
$5.1 Billion

Carbon savings per year
16.7 Million metric tons CO_2

Realize Full Performance with Integrated Systems

Integrated systems package the motor, drive, and driven equipment into a single unit, offering several key benefits:

- Simplified Commissioning:
  Easier commissioning ensures long-term energy savings and non-energy benefits
- Faster Installation:
  Streamlined design cuts down installation time.
- Extended Lifetimes:
  Variable speed controls reduce maintenance, extend equipment lifetimes, and improve process precision and efficiency.
- Advanced Monitoring:
  Integrated systems offer advanced monitoring capabilities, including fault detection, diagnostics, and seamless integration with load flexibility (demand response) programs.

The Importance of Commissioning:

Proper commissioning is crucial to fully realize these benefits. Studies show that **10–20%** of commercial pump and fan VFD installations are commissioned incorrectly, leading to missed opportunities for efficiency gains.[2]

1 The savings potential relies on Cadeo's assessment of DOE's 2021 Motor System Market Assessment, BPA's Adjustable Speed Drive Market Model, and feedback from subject matter experts. For details of the underlying research and computations, please refer to the associated Excel workbook: pumps.org/efficientbuildings.

2 NEEA 2018 Commercial Building Stock Assessment data on VFD controls, https://neea.org/resources/cbsa-4-data-files

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Upgrading commercial fan systems delivers significant savings to businesses and the planet.

Right-sizing, load matching, and replacing existing fans with new, more efficient models can save nearly 30,000 GWh/year. This represents 16% of total commercial fan electricity consumption in the United States.

Total Savings Opportunity in Commercial Fans[1]

Energy savings per year
36 Natural gas power plants

Cost savings per year
$3.7 Billion

Carbon savings per year
Over 12 Million metric tons CO_2

Right-sizing

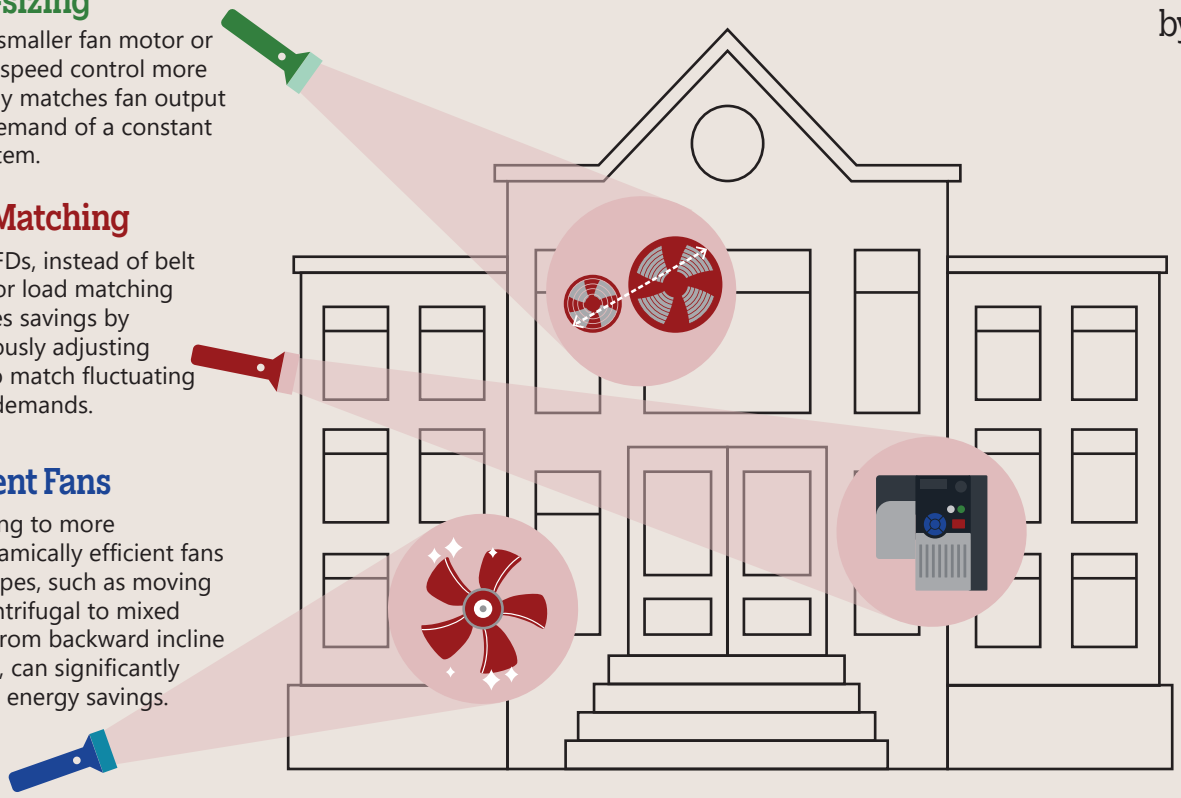
Using a smaller fan motor or variable speed control more efficiently matches fan output to the demand of a constant flow system.

Load Matching

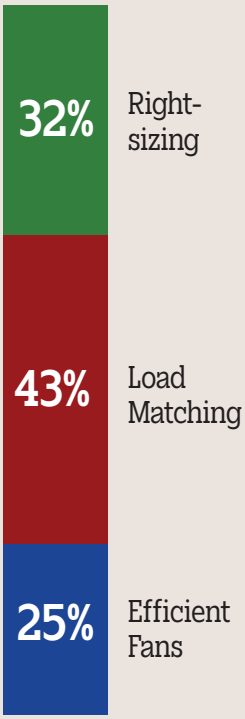
Using VFDs, instead of belt drives, for load matching optimizes savings by continuously adjusting speed to match fluctuating system demands.

Efficient Fans

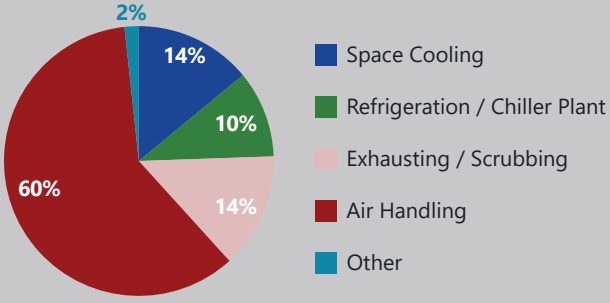
Upgrading to more aerodynamically efficient fans or fan types, such as moving from centrifugal to mixed flow or from backward incline to airfoil, can significantly enhance energy savings.



Share of Total Savings, by Opportunity



Distribution of Commercial Building Fan Electricity Consumption in the United States, by Application[2]



Certified fan products boost buyer confidence

AMCA International's Certified Ratings Program (CRP) assures buyers, specifiers, and users that their fans are tested and rated in compliance with rigorous test standards and rating requirements. Benefits of the certified fans include:

- Reliable energy efficiency assessments
  leading to lower operating costs and reduced environmental impact.
- Trust in performance metrics
  such as airflow and sound levels, ensuring they are accurate and consistent with the manufacturer's claims.
- Assurance of compliance with industry standards,
  essential for regulatory and project requirements.

1 The savings potential relies on Cadeo's assessment of DOE's 2021 Motor System Market Assessment, BPA's Adjustable Speed Drive Market Model, and feedback from subject matter experts. For details of the underlying research and computations, please refer to the associated Excel workbook: pumps.org/efficientbuildings

2 DOE 2021 Motor System Market Assessment, https://eta-publications.lbl.gov/publications/us-industrial-and-commercial-motor.

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