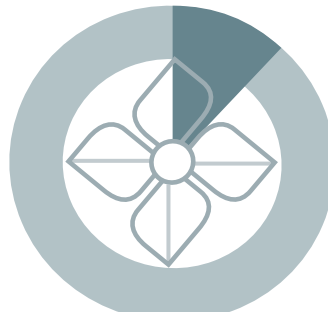


OPPORTUNITY

How much energy is used for ventilation in U.S. office buildings?

12%
OF ELECTRICITY

goes to fan ventilation¹



ADDITIONAL SAVINGS POSSIBLE

Belt-driven fans are also used in non-ventilation applications

TECHNOLOGY

How do synchronous and cogged fan belts save energy?

REDUCE FRICTION AND BENDING RESISTANCE

by notching the inner side of the belt

synchronous belts also **reduce slippage** by integrating teeth with slots on the motor pulley

2-5%
MORE EFFICIENT
than standard v-belts

M&V

Where did Measurement and Verification occur?

NATIONAL RENEWABLE ENERGY LABORATORY measured the performance of cogged V-belts and synchronous drive belts provided by the Gates Corporation at the Byron G. Rodgers Federal Building and U.S. Courthouse in Denver, Colorado

RESULTS

How did synchronous and cogged fan belts perform in M&V?

2-20%
ENERGY SAVINGS

for synchroNous on VFD
2% at 60 Hz, 20% at 15 Hz
Cogged fan belts offered half the savings²

75%
LOWER O&M

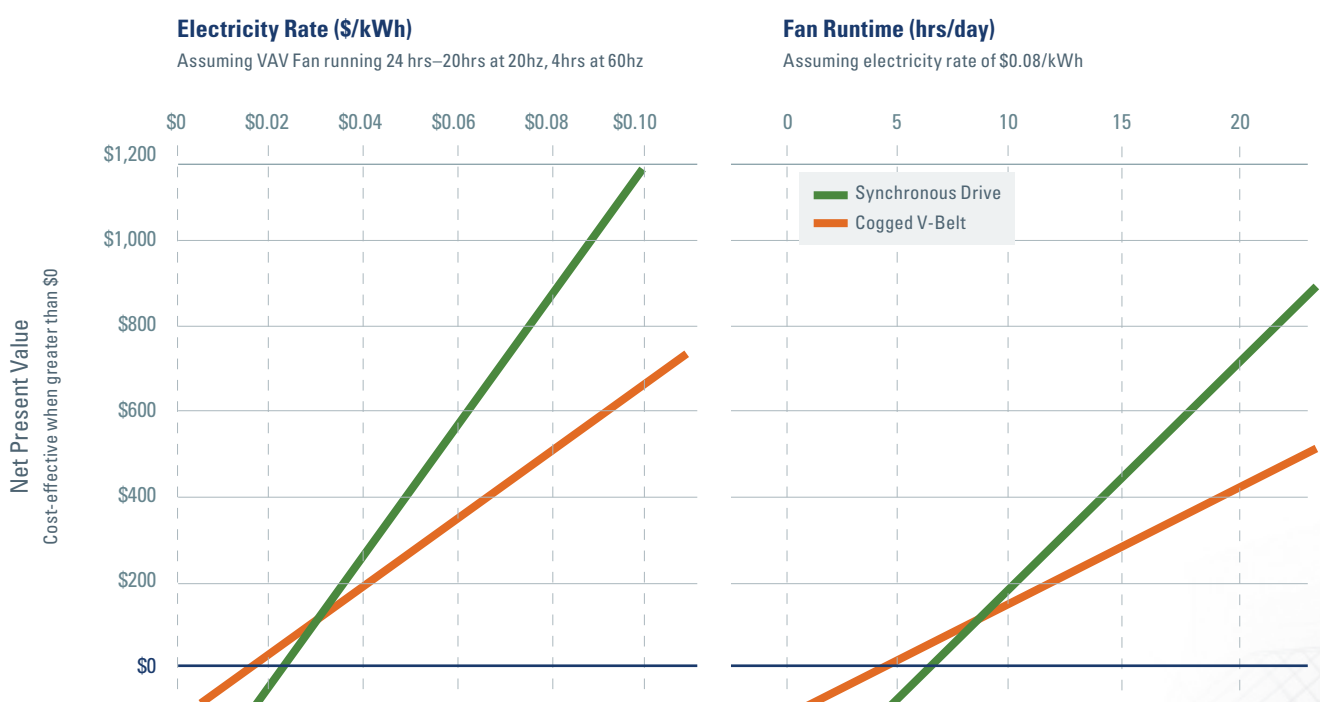
for synchronous
Cogged O&M equivalent to standard V-belts³

<4 YEARS

payback for synchronous⁴
Repeat installations have immediate payack; Cogged payback < 1 year⁵

Net Present Value as a Function of Electricity Rates & Fan Runtime

Synchronous cost-effective at \$0.024/kWh or 6.8 hrs/day; Cogged cost-effective at \$0.015/kWh or 4.3 hrs/day



DEPLOYMENT

Where does M&V recommend using synchronous and cogged fan belts?

REPLACE V-BELTS WITH SYNCHRONOUS DRIVE BELTS ON ALL VFD FANS

Belts on fans with high operating hours should be replaced first

ON CV FANS, REPLACE V-BELTS AT END-OF-LIFE WITH COGGED V-BELTS

¹Synchronous and Cogged Fan Belt Assessment. Dylan Cutler, Jesse Dean, Jason Acosta (NREL), March 2014, p.1 ²Ibid, p.2 ³Ibid, p.3 ⁴Ibid, p.5

⁵Ibid, p.4