

OPTI-VISOR™

**Ultra-efficient chiller
plant automation**

**MAKE YOUR
BUILDING
TOO GOOD
TO LEAVE**



SOLUTION POTENTIAL

FILE NO: 90.21
DATE: MAY 2013

SUPERSEDES: 90.21
DATE: JANUARY 2012

ENERGY EFFICIENCY

IS GOOD FOR BUSINESS

Tenants searching for commercial office space increasingly view energy efficiency and sustainable operations as important considerations in choosing between locations.

63%

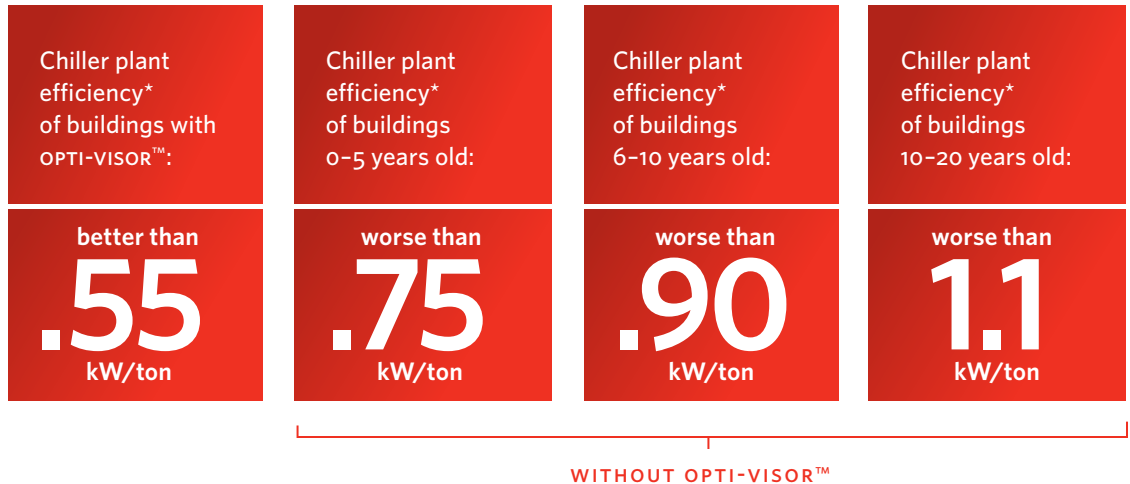
**WILL PAY A
PREMIUM PRICE**

63% of tenants are prepared to pay a premium to occupy green space with 14% willing to pay more than 10% extra.

2007 Canadian
Office Tenant Survey
commissioned by
Colliers International

Making your building more energy-efficient can set you apart from the rest of the market.

ENERGY EFFICIENCY COMPARISON



Newer buildings are generally more efficient than those built 10 to 20 years ago. Faced with market pressures to upgrade energy efficiency, owners of buildings have many retrofit options. Comparing a range of options for retrofit projects reveals that an OPTI-VISOR™ installation can be more financially attractive than many of the projects building owners might normally consider.

Even though you may have a restricted budget for your retrofit projects, you can still substantially reduce your operating costs with a smaller investment in an automated system that can improve the energy efficiency of your overall HVAC system.

POTENTIAL ENERGY SAVING INITIATIVES PAYBACK

The Armstrong OPTI-VISOR™ is an automated HVAC control solution that will boost the energy efficiency of your new building by 25%. It's a simple bolt-on retrofit that works seamlessly with both your existing variable primary flow HVAC plant and your BAS to provide optimal cooling efficiency. By analyzing and controlling your existing HVAC system components for maximum efficiency, OPTI-VISOR™ will:

Lighting retrofit	Less than one year
OPTI-VISOR™ installation	6-36 months
Planting trees for shade and wind barrier	5-8 years
Window replacement	10+ years
Window film	10-12 years
Reflective coating	10-15 years
Roof insulation	12-15 years
Investment in alternative sources of energy (wind, solar)	20 years

Save energy

Reduce your carbon footprint

Improve occupant comfort

Reduce equipment damage risk

*Annual average chiller plant efficiency including pumps, chillers and cooling towers. Actual performance may vary dependant on climate and load control.

TENANT

COMFORT

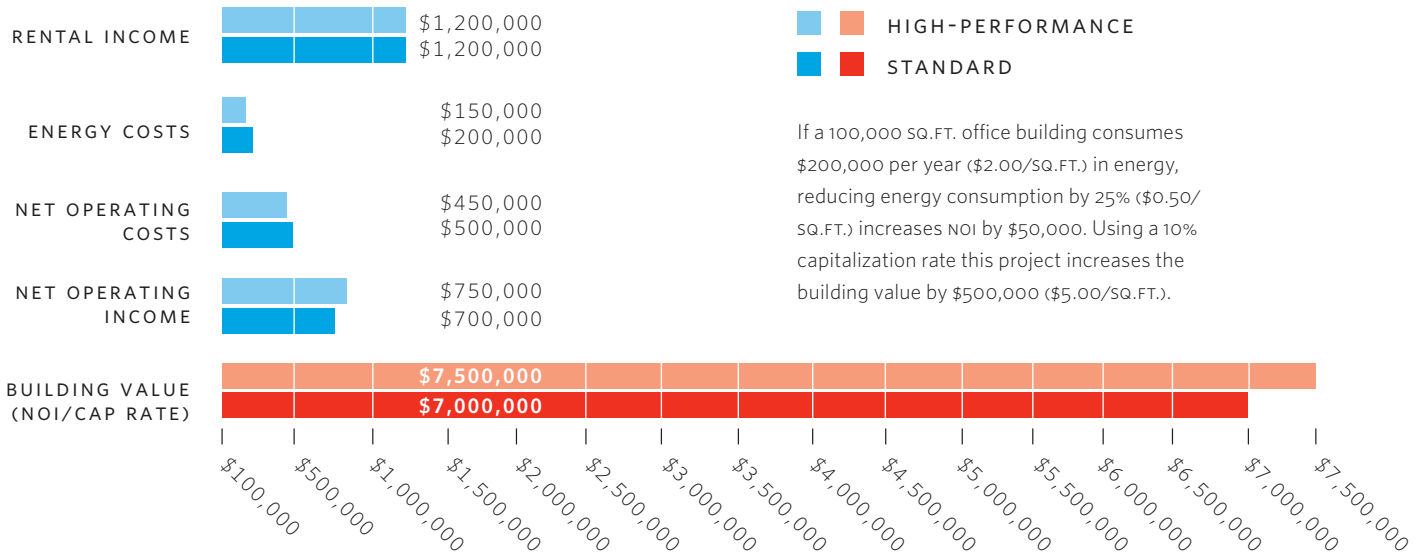
Your tenants won't notice the installation of an OPTI-VISOR™ system, but they will notice improved comfort on part load days.

As an example, OPTI-VISOR™ helps to prevent 'on-off' cycling of cooling equipment, which contributes to tenant discomfort.

SAVE 25% OR MORE ON HVAC OPERATIONS

Installation of an OPTI-VISOR™ can reduce annual energy costs of your chiller plant by 25% or more. Cost reductions of that magnitude will increase the market value of your building.

APPRAISED VALUE AS A FUNCTION OF NET OPERATING INCOME



HIGH-VALUE TECHNOLOGY AND SERVICES

Installations of an OPTI-VISOR™ system are augmented with a service offering that includes:

OPTI-VISOR™ ENERGY SAVINGS

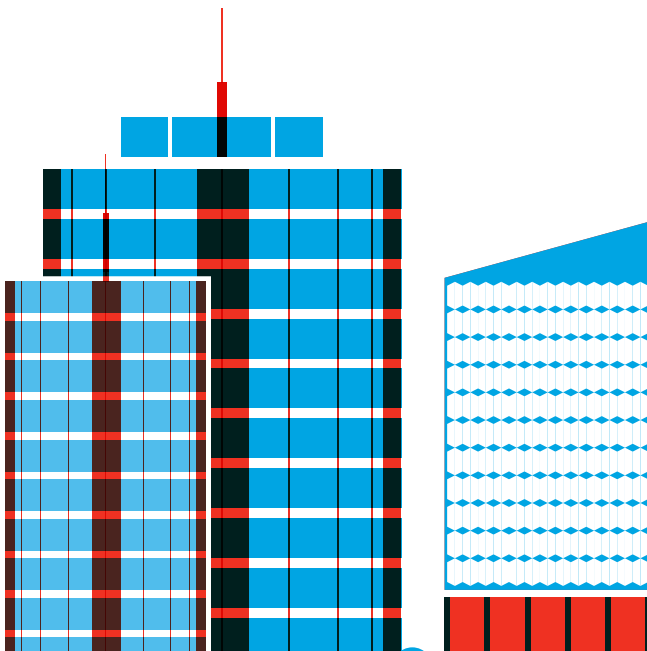
In a 480,000 SQ.FT. building with 1,200 design cooling tons, an industry standard HVAC installation might operate at 0.75 kW per ton. With an OPTI-VISOR™ installation, that same building would operate better than 0.55 kW per ton:

- An energy analysis
- Eligibility for a performance sharing incentive program
- A one-year subscription to Armstrong's ECO*PULSE HVAC Health Management Service
- Quarterly performance assessments conducted by Armstrong's Building Services Team

$$2800 \times 528 \times (0.75 - 0.55) \text{ kW/ton}$$

HOURS AVG. TONNAGE EFFICIENCY IMPROVEMENT

= 295,680
kW HOURS SAVED



EQUIVALENT TO*

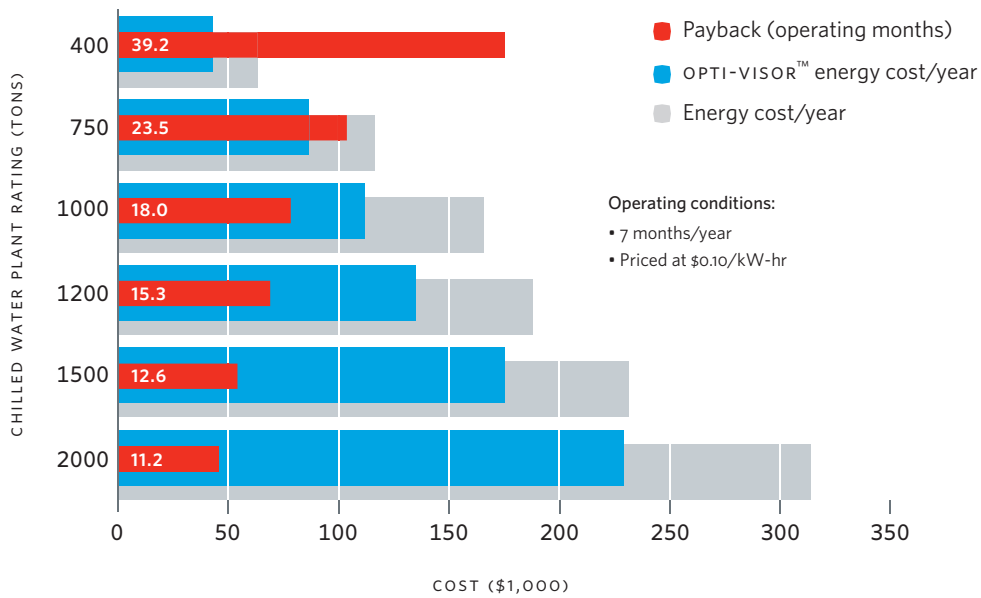
- CO₂ emissions from 30,056 gallons of gasoline
- CO₂ emissions from burning 1.5 railway cars of coal
- CO₂ emissions from the electricity use of 33.4 homes for one year
- Carbon sequestered annually by 57.2 acres of pine or fir forests

*Based on EPA data models (www.epa.gov).

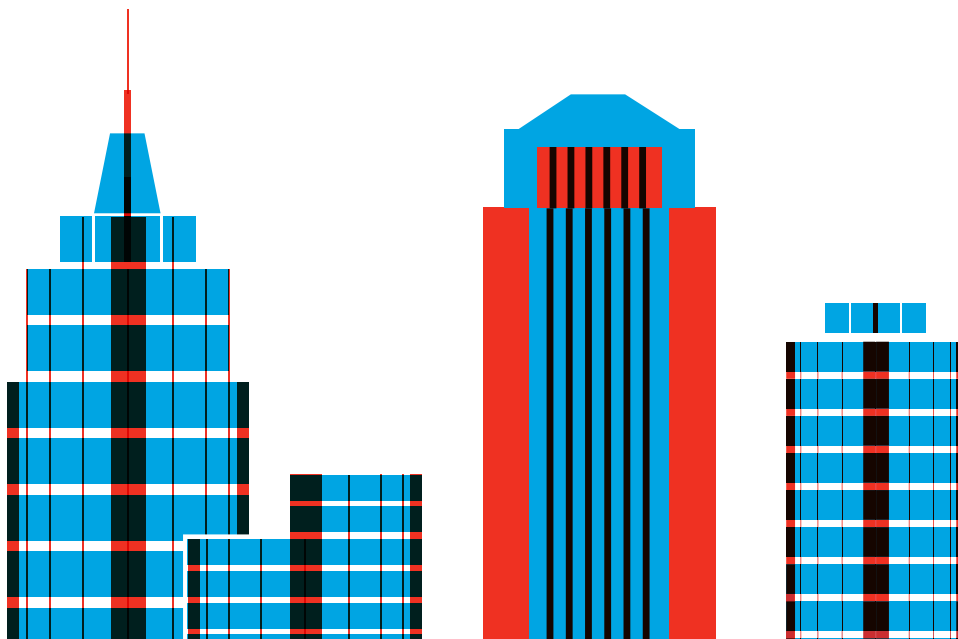
PAY

BACK

OPTI-VISOR™ payback opportunity



Retrofit projects that improve HVAC efficiencies pay back the costs of the project over time through energy savings. Depending on the existing efficiency levels and cooling profile of a building, installation of an OPTI-VISOR™ can save enough energy to generate a payback on the project cost in less than one year.



**THE
PERFECT**

**RETROFIT
SOLUTION**

The Armstrong OPTI-VISOR™ is a simple add-on to any existing building automation system (BAS). The OPTI-VISOR™ is a retrofit solution for many different building types, even buildings less than five years old.



The best opportunity for efficiency improvements is a building with:

Variable-speed HVAC systems employing variable primary flow

An existing BAS

No stress, no maintenance

The Armstrong OPTI-VISOR™ is a plug-and-play control technology that is simple to install and commission, and requires no maintenance. Even during the installation, there is minimal interference with your HVAC operation, so you don't need to worry about interruptions in cooling.

Take a low-risk approach

Installing an OPTI-VISOR™ will reduce your risk of system failure. Many existing HVAC systems do not have adequate controls in place to prevent equipment damage. OPTI-VISOR™ units are site-configured on installation to operate the plant within the manufacturer recommended limits of your equipment. Installations are performed in collaboration with your controls contractor and operating staff. Armstrong personnel are available to support the processes every step of the way, including the first year of operation.

Increased tenant comfort

Faster response

Better stability

Increased system efficiency

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View your savings and ROI
using real data from your
installation. **Ask your
Armstrong representative.**

MAKING
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MAKE
SENSE™