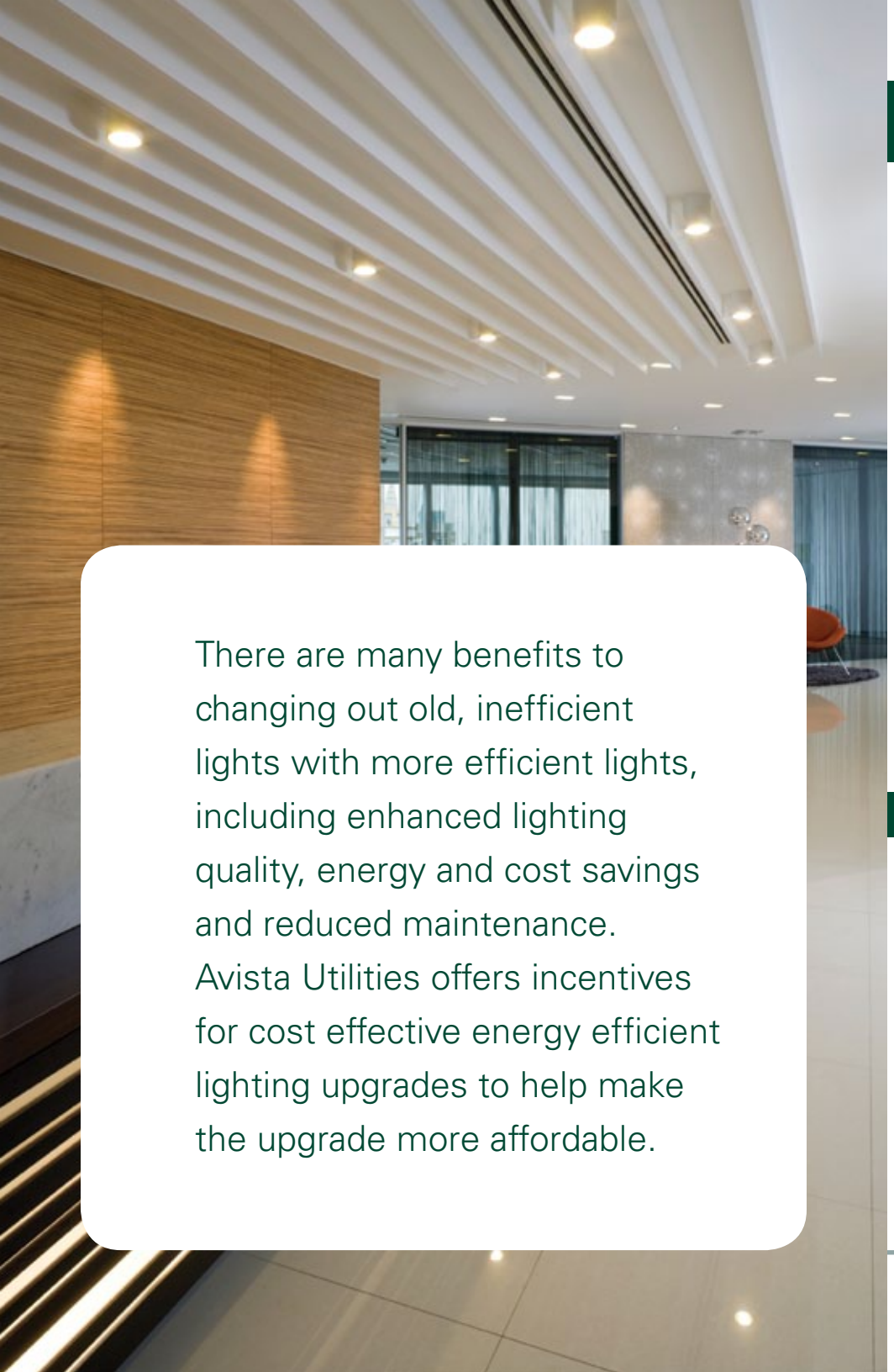
# Commercial Lighting Facts

AVISTA®



There are many benefits to changing out old, inefficient lights with more efficient lights, including enhanced lighting quality, energy and cost savings and reduced maintenance. Avista Utilities offers incentives for cost effective energy efficient lighting upgrades to help make the upgrade more affordable.

## COMPACT FLUORESCENT LIGHTING

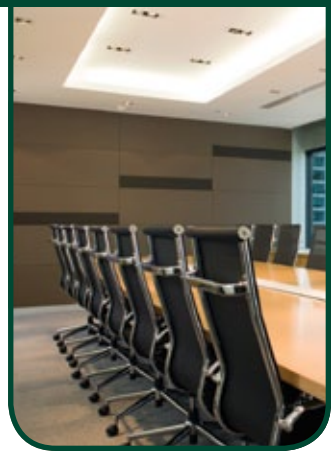
A standard incandescent bulb is very inefficient because much of the energy it uses is turned into heat instead of light. A compact fluorescent (CFL) bulb turns more of its energy into light and less into heat.

- CFLs use 75% less energy than standard incandescent bulbs while supplying the same amount of light.
- They have a longer life, up to 10 times longer than incandescent bulbs.
- They can reduce space cooling costs because they generate less heat than incandescent.
- Dimmable CFLs are also available. Installation of a solid-state switch is required.

## COLD CATHODE

A cold cathode light is an enclosed tubular light that works by passing an electrical current through a gas or vapor, much like neon lighting. It can be used as a replacement for incandescent lamps up to 60W–70W in situations where compact fluorescents are not adequate.

- Cold cathode lights can come in many sizes and colors.



- The cold cathode may be dimmed by any dimmer used with incandescent lamps.
- They can be used in flashing mode.
- They are up to five times brighter than neon lighting.

## INDUCTION FLUORESCENT

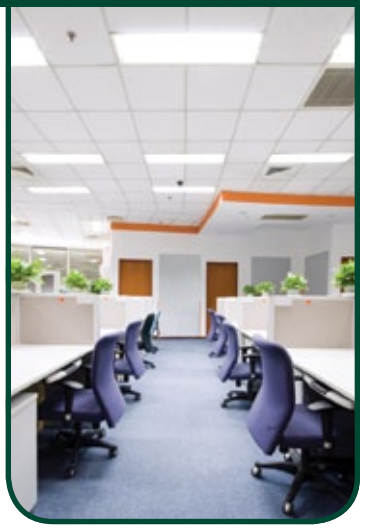
Induction fluorescents are an electrodeless light source in which the power required to generate light is transferred from the outside of the lamp envelope by means of (electro) magnetic fields. This is in contrast to a typical electrical lamp that uses electrical connections through the lamp envelope to transfer power. There are three advantages of eliminating electrodes:

- Extended lamp life, because the electrodes are a limiting factor in lamp life.
- The ability to use high efficiency light-generating substances that would react with metal electrodes in normal lamps.

## LED LIGHTING

Light Emitting Diodes (LEDs) produce more light per watt than incandescent bulbs in some directional lighting applications like exit signs and traffic signal lights. The solid package of the LED can be designed to focus its light where as incandescent and fluorescent sources often require an external reflector to collect light and direct it in a usable manner. LEDs are ideal for use in applications that are subject to frequent on-off cycling and where pure colors are required. LEDs producing white light are now competing with some other efficient sources and may be used in some applications. Look for the ENERGY STAR® designation on LED products and IES LM-79 & LM-80 testing reports for products producing white light.

## T-12, T-8 AND T-5 FLUORESCENT LIGHTING



One of the most common lighting retrofits is the conversion of T-12 lamps to T-8 lamps. T-12 fluorescent lighting is far less efficient than the T-8 fluorescent lighting technology. The T-8 fluorescent tube produces the same light output while using less energy than its T-12 counterpart. The T-8 is also superior to the T-12 in its ability to accurately render colors. In addition, the flicker and hum associated with older fluorescent technology has virtually been eliminated.

- **T-12s:** T-12s are a common type of fluorescent light. The "12" means that the tube has a diameter of 1½ inches (12/8$^{ths}$). They commonly come in lengths of four and eight feet.
- **T-8s:** T-8s are a more efficient form of fluorescent lighting than the T-12. They most commonly come in four-foot and eight-foot lengths, and are just one inch in diameter (8/8$^{ths}$). Although the T-8 lamps are slimmer than T-12s, identical pin spacing makes them easy to install in an existing fixture. Only the lamps and ballasts need to be changed.

- **T-5s:** T-5 lamps are smaller in diameter (5/8") than a T-8 and operate only with electronic ballasts. Since they are about 2 inches shorter than a T-8 or T-12, they are not intended as a retrofit but are used in new fixture designs. A high output T-5 lamp is very bright with over 5,000 lumens output. The T-5 HO (high output) lamp works best in high bay applications. It is a replacement for high-intensity discharge (HID) light sources, such as mercury vapor, metal halide and high-pressure sodium lamps. T-5 lamps provide instantaneous start-up while HID lighting requires a 4 to 15 minute warm-up period.

## HIGH-BAY LIGHTING

There are several options available to replace High Intensity Discharge (HID) lighting.

- Fluorescent T-5s and T-8s can provide increased light levels over HID while offering instant-on capabilities, longer life and reduced maintenance costs.
- Pulse-start metal halide lamps are another type of HID lighting. Pulse-start lamps have a greater light output than standard metal halide. Installing pulse-start metal halide lighting can reduce costs by up to 40–60% when compared to other HID lighting. In addition, pulse-start metal halide lamps have a much longer lamp life and provide a better quality of light.

## EXIT SIGNS


Exit signs have an excellent potential for energy savings, as they are illuminated 24 hours a day, 365 days a year. Replacing existing incandescent exit signs with more efficient LED models is also a very inexpensive project. We recommend using ENERGY STAR compliant LED exit signs.

## ENERGY AND COST SAVINGS

One of the benefits to changing out old, inefficient lights with more efficient lights is the energy and cost savings that are achieved. Here is an example of potential energy and cost savings when a T-12 fixture is retrofitted with a T-8:

**Cost Savings Calculation**

$$\left( \frac{\text{watts saved} \times \text{yearly hours of operation}}{1000} \right) \text{energy cost} = \text{\$ saved per year}$$

**Step 1:** Determine the savings in watts.

- Total average watts for a 4-Lamp T-12 fixture = 162
- Total average watts for a 4-Lamp T-8 fixture = 112
  Subtract the existing wattage from the proposed wattage:
  162-112 = 50 watts saved

**Step 2:** Determine watt hours per year.

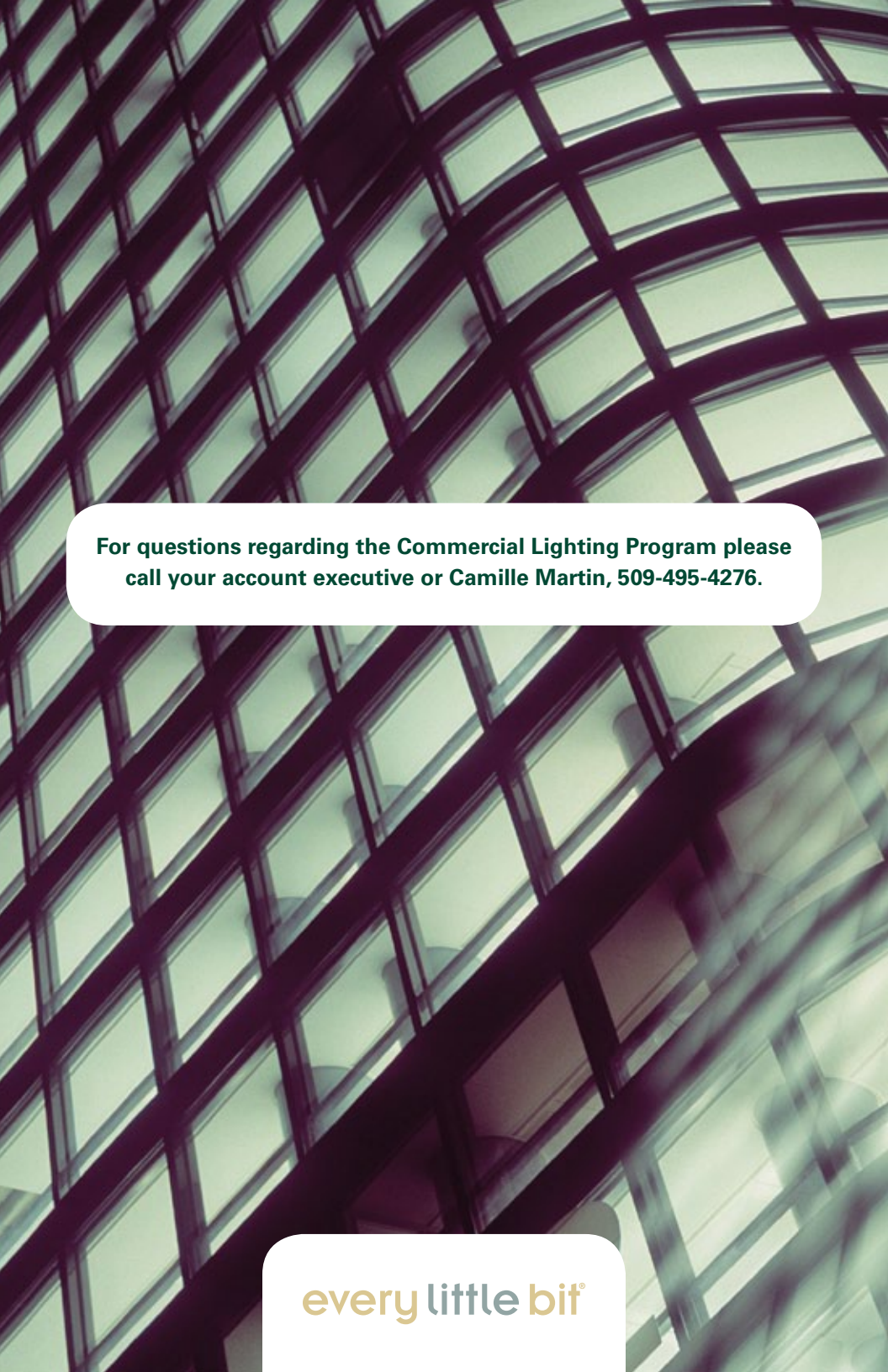
- Multiply the watts saved by the hours of operation:
  *(For this example we will use 3120 hours which is 12 hours per day x 5 days per week x 52 weeks per year.)*
  50 watts x 3120 hours = 156,000 watts per year

**Step 3:** Convert watts hours to kilowatt-hours (kWh).

- Divide watt hours per year by 1000
  156,000 divided by 1000 = 156
  Each fixture from this example will save about 156 kWhs per year.
  *(Savings from cooling not included.)*

**Result:** Determine cost savings per year.

- Multiply the kWh savings by the energy cost:
  156 x $0.07 *(cents per kWh will vary per rate schedule)* = $10.92
  There will be $10.92 per fixture per year in energy cost savings.



For questions regarding the Commercial Lighting Program please call your account executive or Camille Martin, 509-495-4276.

every little bit®