My Green Home's Guide to Globes

This is the era of choice in lighting, which can also make it a time of confusion. Learn the basics to be green shopper who knows what's watt. (Or just skip to our Buying Recommendations at the end.)

Step 1 - Know your lighting technology

Incandescent

These are the globes that have been around for more than 100 years. They are cheap to buy and always dimmable, but they waste electricity by creating more heat than light and do not last very long.

Halogen

These are also incandescent, but because the globes are filled with halogen gas, they last a little longer and are about 20% more efficient. The little dichroic reflector bulbs used in downlighters are usually halogen, but halogen globes are also available in many other shapes.

Fluorescent tube and CFL

Fluorescent tubes and compacts fluorescent lamps (CFLs) use significantly less electricity and last longer than any incandescent. They are rarely dimmable, however, can be a little slow to start up and have to be disposed of carefully because they contain mercury. CFLs look like thin glass tubes in a twist shape or in loops.

LEDs

Light-emitting diodes, or LEDs, are the newest lighting technology. They've been common in calculator displays and as tiny red or green indicator lights on appliances for many years, but only recently have they been made white enough and bright enough to replace incandescent globes. LEDs last far longer than any other kind of light, as much as 40 times longer. And they use the least electricity. typically between a sixth (1/6) and a tenth (1/10) the electricity of the equivalent incandescent. The first generation of LEDs gave off a rather bluish light and were not very bright. The latest LEDs from major brands give off a white or warm-white glow and are as bright as almost any incandescent. Some LEDs are dimmable, but may require a new dimmer. LEDs cost more upfront, with a price range of about R50 to R250, but even if they are only used a couple of hours a day, some can pay for themselves in less than a year.

Step 2 - Know your globe shapes

Standard bayonet or screw-in globes

Each of these bulbs and bases has a code name like A19 or E14, but you don't need to know them. To replace an incandescent with an LED or CFL, just take along an old bulb when you go to the shop or remember these three things:

- Is the base a screw or bayonet?
- Is the base fat or thin?
- What is the basic shape of the bulb?

Halogen-type downlights

Fixtures made for dichroic reflectors come with two different kinds of connectors. Low-voltage connectors are two pins at the base of the globe that push straight into the fixture. This shape is called MR16 or GU5,3. The mains voltage or 220v connectors have a club or knob shape that is pushed in and twisted, in a bayonet motion. This form is called GU10.

LEDs are available in both low-voltage MR16 and mains-voltage GU10, but the mains-voltage versions are easier to find, can be less expensive and more efficient, and are simpler because their fixtures don't need transformers. (If you have low-voltage halogen lights, there are transformers hidden in your ceiling or in the fixtures.) For this reason, most lighting in commercial buildings has been switched from low-voltage to mains-voltage when upgrading to LEDs.

Step 3 - Know how to read the packaging

Brand

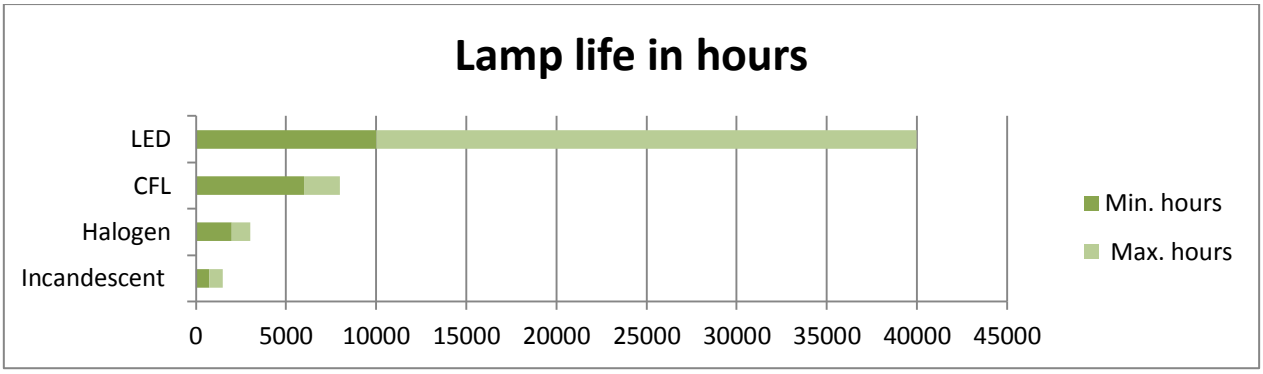
Only buy quality globes from reputable lighting brands you know and trust. The market is flooded with cheap LEDs from small, new companies. Many of them are of poor quality.

Brightness

The packaging on many globes provides figures for lumens or candelas to indicate brightness. These numbers can get confusing. It is easier to know the wattage of the incandescent globe you need to replace and look for an LED or CFL that is equal to it. Equations such as '10w = 60w' should be prominently displayed on the packaging.

Colour

- Cool white: Similar to the light from the sky, but it can look unnaturally blue indoors
- White: Renders colours nicely, slightly more bluish than incandescents
- Warm-white: Imitates the slightly orange tint of incandescent globes best
- Yellow: For outdoor lights, yellow bulbs do not attract insects



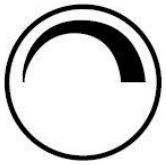
Lamp life

This is given in hours or years, usually converting 1 000 hours to one year, which assumes the globe is used 2,7 hours a day.

- Incandescent: 750 - 2 000 hours or 9 months - 2 years
- Halogen: 2 000 - 3 000 hours or 2 – 3 years
- CFL: 6 000 - 8 000 hours or 6 - 8 years
- LEDs: 10 000 - 40 000 hours or 10 - 40 years. (Less expensive LEDs tend to have lower lamp life because they lack features to reduce heat build-up.)

Dimmability

The symbol for a dimmable globe is at the right. If you see the image with an X across it, the CFL or LED bulb is not dimmable. Because dimmable CFLs and LEDs are more expensive, the word dimmable will be prominently displayed on their packaging.



Beam angle

Halogen downlights and their LED replacements give a beam angle that indicates how broadly or narrowly they cast their light. The most common halogen beam angles are 35 to 38 degrees. Any bulb with a beam narrower than 35° will give more of a spotlight effect.

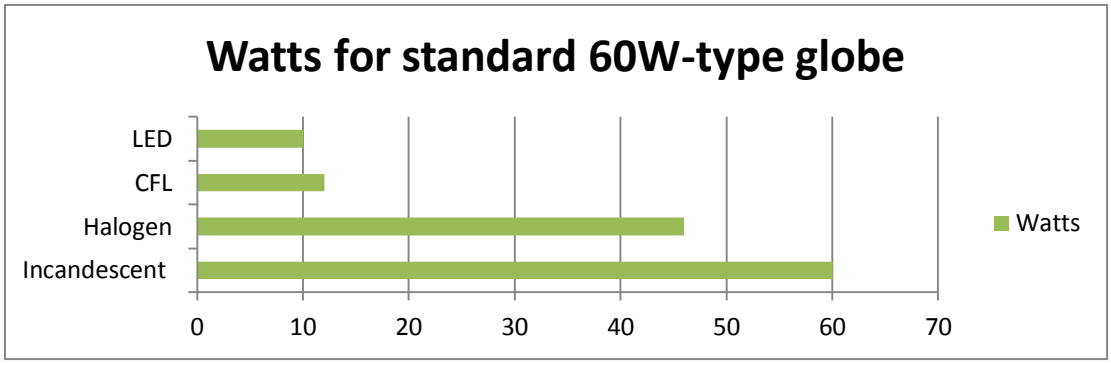
Step 4 – Understand the real costs

Who would buy a R250 bulb when a R15 bulb will work? A person who knows his or her maths and wants to save in the long term.

Say you and your friend both use a 60 watt incandescent bulb for 3 hours a day. Your friend sticks with the incandescent because he only wants to spend R15 for a bulb. At the end of 10 years, he will have replaced it several times and will have spent well over R1 000, most of it paid to his electricity supplier.

If you splash out on a R250 LED equivalent, however, you will probably have replaced that bulb once at most in 10 years. And your total cost in bulbs and electricity will be less than R575, leaving you about R450 richer than the ‘cheapskate’ who only paid R15 for his globe.

These are very conservative figures. They use a median South African electricity tariff and even assume that the price of electricity does not rise. Chosing a more affordable LED option, such as 50 watt equivalent GU10 downlighter on sale for R99, and using one of the higher kWh tariffs in South Africa leaves you, the LED buyer, R860 richer after 10 years for every LED bulb you buy.



Step 5 – Consider these buying recommendations

Starting from scratch, buying new ceiling fixtures

Purchase fixtures that use mains-voltage GU10 bulbs. For every room where the lights are on for an hour or more per day, buy major-brand LED bulbs for between R50 and R150 in the equivalent to 35 watt or 50 watt halogens.

Replacing 60 watt incandescent bulbs in table lamps, pendants, etc.

LED equivalents in this wattage are a little harder to find and more expensive – R140 to R250 for reputable brands – but they will pay for themselves within a couple of years if the light is on two hours a day or more. Be aware that in this shape, LED globes shine more of their light upward, away from the base. So the bulb will seem brighter hanging with the base up, such as in a pendant, than it will base-down, like in a table lamp. If the upfront cost is more than you can afford or you don't use the light much, twist-shape CFLs work well in these fixtures.

Replacing 100 watt incandescent bulbs in floor lamps, pendants, etc.

If you need the brightness of a 100 watt globe, your only current options for improving energy efficiency are a halogen bulb using about 75 watts or a CFL that uses 20 watts. Switch to one of these while waiting for LED technology to improve. Brighter, better LEDs are being developed every year.

Replacing mains-voltage, GU-10 halogen downlights

Buy major-brand LED bulbs for between R50 and R150. Even if you use the lights for just an hour a day, they can pay for themselves in about a year. 35 watt equivalent LEDs are often less expensive and easier to find. If you currently use 50 watt halogens and the room is too brightly lit, consider these.

Replacing low-voltage, MR-16 halogen downlights

If you have an electrician already involved in upgrading your lighting, ask about changing your low-voltage connections to mains-voltage. The parts are inexpensive and it's a fairly simple process. If you would rather not involve an electrician, buy low-voltage, MR16 LED bulbs from major brands for between R50 and R150. Phone around first because they are a little harder to find. As with GU-10s, above, you can expect to save enough to pay for the bulbs in about a year and might want to consider 35 watt equivalent LEDs.

Replacing downlights on a dimmer

Buy dimmable LED replacements for halogen downlights. If your dimmer is the old rotary style, buy a push-button electronic dimmer designed for LEDs and have it installed by an electrician.

Replacing standard bulbs in enclosed fixtures

If your bulb is glassed in with no way for hot air to escape, a CFL is a better replacement than an LED, because the lamp life of an LED will shorten if it gets too hot. If buying fixures, avoid enclosed lights to prevent this problem.

Installing security lights

Buy motion-sensor lights. Even with incandescent floodlamps, if they turn on only when someone walks past, they will use little electricity. If you may leave them on for longer periods, buy LED motion-sensor lights.